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EDITORIAL

Physical inactivity kills (I*): current statistics and trends
Inactivitatea fizică ucide (I*): statistici actuale şi tendinţe

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In the wake of the sinister tragedy that occurred at the "Colectiv" Club on the night of October 30th, 2016 – an event which by the time this article was written had produced 64 deaths and a number of wounded either unknown or undisclosed – a wave of inflaming slogans followed, rivalling each other in inspiration: corruption kills, indifference kills, incompetence and hypocrisy kill, bureaucracy kills and so on. Being the undeniable offspring of sincere and justified outrage, such slogans are fated in time to lose not the truth of their meaning but their contemporaneousness, and will unavoidably fall into oblivion. That is because ever new shocking events and horrible tragedies will occur in time, bound themselves to generate fresh slogans and new outcries.

We ask the questions then: why is it that only violent, momentary tragedies must be received – and oftentimes perceived in hyper magnitudes – as worthy of immediate, firm and, in appearance at least, adequate and efficient reactions? How come other habitual phenomena, other mundane occurrences – such as traffic accidents, smoking, physical inactivity and sedentariness which generate obesity, "the slow-creeping catastrophe" (1) – do not produce such vigorous retorts, do not „enjoy" such extensive and strong consideration, and how come they do not produce genuine social insurgencies?

To such a logical inquiry we will likely be answered that, in point of fact, with regards to such events as those quoted, awareness is being raised, measures are being taken, programs are created and rules are being enacted too, with the purpose and expectations that they will mitigate the impact and undesired effects, will reduce and even eliminate their consequences on the health and quality of life of individuals, and of the population as a whole. Such answers will be, in themselves, not untrue! The issue is that the intensity and visibility of those reactions are disproportionately minute compared to the real dangers that such phenomena pose. And even more so, all too often, the mitigating concepts, measures, programs and actions only engage those who are on some level professionally plugged in (with some of them rather only formally involved, as it is quite commonplace that anti-tobacco activists are smokers, advocates of fitness and activity are loafers, traffic policemen are ignorant of traffic laws and so on), whereas the targeted population, the ordinary individual minding his own business only receives motivational quotes and smart catch-phrases condemned to be ignored from the start. There is an explanation in all this for the unawareness which hides the seriousness and obviousness of the risks posed by those behaviours listed so far for the majority of the population, and a justification for the lack of results.

The idea that there exists an unquestionable link between physical activity and health is so old and widespread that it has long become commonplace. So that if you were now to initiate an online search for "physical activity health", it would take Google a mere 0.49 seconds to display 180 million results. In reference to the evolution of this concept and the arguments on which it rests, we have ourselves published works on several occasions, the first of which was close to two decades ago, in a volume published under the aegis of the Romanian "Sport for All" Federation (Dumitru, 1997). Continuing to be preoccupied with this subject, and animated by the hope that once accepted into the European Union, the achievements and interest shown in the idea of sports for health will reach new heights in our country as well, we published further works, the most consistent of which being released nine years ago (Dumitru, 2007a; Dumitru, 2007b). At that time, our optimism was being fuelled by the numerous initiatives, programs and projects frantically launched by the European Council and European Commission in cooperation with the WHO Europe, as it can be seen in the bibliography of the two aforementioned articles.

We find ourselves today a little more than a decade since those initiatives, projects and programs which, at the time, were meant to generate considerable hope. The decade should have been ample enough for those ideas and proceedings to become hard fact, or at least to produce such hints that certain alarming trends are subsiding and that the statistics which at that time startled policy makers of all ranks into action have become less grim.

What is however the reality of today? What messages do we pick up from the documentation produced more recently by the above mentioned European institutions and by their plethora of exceedingly well-paid employees and fellows? How much guarantee do we extract from the analyses those institutions have so magnanimously financed and how much confidence can we invest in the likelihood that initiatives, projects and programs they are now implementing will clearly differ from what we have so far, and be genuinely

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efficient? In short, can we continue to entertain hope – and if so, for how long will it be required – that obesity will be relegated from its current rank of pandemic, a rank it has acquired only as a consequence of the fact that everything designed and enacted so far was a mere botchery, a great and pricey hoax, costly not only in currency but also in the time wasted and perhaps never to be recovered? And, finally, that on a global scale physical inactivity will not continue to cause the annual death of millions of people?

The analysis we propose through the pair of editorials we have designed, is an enterprise which hopes to deliver more or less direct answers to this variety of very actual and very pressing questions and dilemmas. It is an action intended to be prudent, inquisitive and as objective as possible, with the caveat that, unlike what happened with the articles produced in 2007, we will reduce to a bare minimum the risk of being easily enthusiastic when reading or learning about portentous programs and projects, filled with good intentions while lacking in effective solutions.

When we speak of physical inactivity and of its alarming consequences, we must not forget for a second that behind every manner of analysis and statistical report being circulated there are, in fact, people. Living, breathing humans like us, people with defined individuality, for whom sedentariness and its dreadful consequences are facts of everyday life and produce physical distress, as well as anxiety and inner experiences of the most frustrating kind. However, because our enterprise cannot be ignorant of factual information, we will note in the following a number of significant statistical reports pertaining to the inquiries and intentions formulated so far.

Obesity – the stumbling block of our species' biological destiny?

Thus, we will briefly mention that in 2008, within the WHO European Region (which includes not only the EU but a total of 53 countries), over 50% of males and females were overweight, and 23% of females and 20% of males were obese. Referring only to the space of the European Union, and considering the inherent variations between countries, the most recent estimations state that overweightness afflicts between 30% and 70% of adults, while obesity ranges between 10% and 30% of the same population (5). With regards to children, up to 33% of 11-year-olds and up to 27% of 13-year-olds are either overweight or obese (4).

The apprehension produced by such blunt figures is notably amplified by the string of data showing evolution in time. At a global level, obesity almost doubled between 1980 and 2008, while within the WHO European Region, the number of overweight children consistently increased between 1990 and 2008 (5). Concurrently, within the same region, between 2002 and 2010 the number of states with more than 20% overweight children rose from 5 to 11 (14), while in just 2 years (between 2008 and 2010) the number of 6-9-year-old overweight children (including obese children) increased from 1 in 4 to 1 in 3 (Storcksdieck Genannt Bonsmann, 2014). Such revelations are downright alarming when paired with the knowledge that at least 60% of overweight children will grow into overweight adults, and that obesity in children strongly correlates with cardiac risk factors, type 2 diabetes, orthopaedic problems, mental disorders, underachievement in school and low self-esteem.

Regarding Romania, an estimate by the WHO in 2008 showed that 53.1% of males and 49.1% of females were overweight, while 16.9% of males and 21.2% of females were affected by obesity. However, according to a predictive model of the WHO, only 12% of males and 9% of females will be obese by 2020 while by 2030 the respective percentages will be 15% and 10% for males and females, respectively (4). Such figures obviously range, in our opinion at least, between unrealistic and fictional. As it is, they are also clearly contradicted by the results of the «ORO Study » (2), conducted in 2014 on a sample of 2,100 individuals, which show that 21.3% of Romanians over the age of 18 (23% of males and 20.3% of females) are afflicted by obesity, the obesity rate escalating in the higher age groups; 9.9% between the ages of 18 and 39, 30.1% between the ages of 40 and 59, and 41.6% over the age of 60. As concerns overweight in the whole population over the age of 18, the figures are 41.6% for males and 24.7% for females. The implausibility that obesity among Romanians will decline is also suggested by the fact that in 2014 there were 52,868 new cases of obesity recorded by family physicians (1), as well as by the recent finding that amongst member states of the European Union, our country ranks in a group with the highest rate of physical inactivity (7).

Physical activity – the most dependable ally, yet increasingly neglected in fighting against obesity

The objective of the present material and the perspective from which it is constructed prompt us to trust that there is no purpose in listing the reasons for which the human being needs to be physically active, and which are the benefits of doing so. They have already been much popularized, also in our journal – we cite the example of the most recent editorial (Bocu, 2016) – and are sufficiently well-known even to the most inveterate sedentary individuals. For these reasons we will only mention here some figures referring to the incidence of physical inactivity, for one thing, and to the consequences and costs of physical inactivity at society level, for another. This data will, in an indirect but still sufficiently persuasive manner, lead us to understand why as responsible individuals we must willingly and permanently adopt an active lifestyle, and also why it is that states and health-responsible organizations are increasingly preoccupied – even to a state of alarm – with statistics pertaining to physical inactivity.

During the last decade and a half, the European Commission has conducted three Eurobarometers among the member states' population – in 2002, 2009 and 2013 – the data produced by the latter being frequently analysed, including within the First Meeting of the European Union Physical Activity Focal Points Network, October 2014 (8). In essence, this most recent estimate on the rate of physical inactivity among citizens of the EU highlighted the following: ♦ 59% of subjects had never or very rarely practiced sports or exerted physical activity, ♦ 54% had not exerted any vigorous physical activity and 44% had not exerted any moderate physical activity during the week preceding the interview, while ♦ 13% had not had a 10-minute

continuous walk during the last week. In comparison with the 2009 Eurobarometer data, the figures have not changed substantially, although it worries that the proportion of those never exercising or playing sport did increase by 3 points (7). In fact, this would not be a surprise, taking into consideration that according to recent WHO data, within the European Region there is the highest percent of individuals spending more than four hours a day sitting.

With regard to children, the situation does not inspire hope either, considering that in 2010 (13) within the WHO European Region only 22% of young girls and 30% of young boys aged 11 exerted one hour of moderate-vigorous physical effort, while in 2012 only 1 in 5 children of EU states exerted moderate-vigorous physical effort with regularity (6). But perhaps even more worrying may be the fact that physical inactivity gains a dramatically increasing trend between the age of 11 and 15 years, and particularly in the case of young girls. For instance, in Romania (quoted alongside Austria, Ireland and Spain) the rate of physical activity among 15 year-old girls is more than 60% lower than in the case of 11 year-old girls (ibidem).

Concerning the native adult population, the 2013 Eurobarometer test placed Romania among the group of states ranking highest in the proportion of inhabitants not performing any physical activity or sport: 60%, the same result as for Italy. If there is any consolation to be had, there are still countries that ranked even higher in this respect: Bulgaria 78%, Malta 75% and Portugal 64% (7).

For a considerable period of time, the only data being collected and made public was of the kind presented above; however, more recently, there has been an increasing surge of works which place a very material emphasis on the importance of physical activity not just for the individuals, but for healthcare systems, economies and societies as a whole. These studies are various analyses and calculations that point out the consequences of obesity and physical inactivity both in the painful terms of loss of human life and in the more rigid dialectic of budget costs and financial burden produced by the increased incidence of chronic sedentariness in the population[#].

Thus, at the present time physical inactivity has become the 4th most prevalent cause of death, accounting for 6% of the global mortality rate. And this is quite understandable, if we only consider that 30% of ischemic cardiac disease cases, between 21% and 27% of breast and colon cancer cases, as well as 27% of diabetes cases are caused primarily by physical inactivity (10). To substantiate this even further, among the 53 states included in the WHO European Region, no less than 1 million deaths are attributed to physical inactivity (13), while a summary of a series of articles published by the *Lancet* journal suggests that 5.3 million annual deaths could be avoided if all sedentary individuals worldwide became physically active; a figure that is marginally higher than the 5 million deaths caused by tobacco smoking every year (11). On the financial plane, what makes headlines is the price tag of 7% of the national healthcare budgets in EU member states directly linked to obesity-related diseases, on top of which there are the higher indirect costs generated by decrease of productivity and premature deaths (3). How this can translate into the particulars of a certain state – which is the one incorporating the EU's third largest population – we can observe from an estimation of costs projected for 2010 (nota bene!) in the UK: 1.06 billion GBP in direct costs generated by the 5 pathological conditions specifically linked to physical inactivity (coronary heart disease, stroke, diabetes, colorectal cancer and breast cancer), plus contingent spending of some further 5.5 billion GBP for medical leave and over 1 billion GPB losses by premature deaths (12).

* *
*

Although in what we wrote so far we encompassed only a small fraction of what ample data exists, we believe there is undeniable evidence that humanity is already confronted with a significant and unprecedented impasse, and more precisely that we are facing a situation which may soon become inextricable. And this because – phylogenetically speaking – humanity has reached an "evolutionary" stage in which the incidence and aggressiveness of obesity and physical inactivity could (but we can even ask ourselves if they really still could!) only be controlled by means of different strategies and measures than the dilettante and simplistic efforts invested so far. Why did it come to this, even though the underlying hazards have been made evident for at least two decades, despite armies of specialists being mobilized and vast sums of money wasted, and even more importantly, what we should change in how we tackle these phenomena which effectively threaten the biological pool of humanity, we will be investigating in the next issue of this magazine.

* This material is the first of a pair of editorials, and will be continued in the next issue of our journal.

[$] Although in technical terms the quoted Eurobarometer test is beyond doubt, we cannot help questioning the relevance and validity of the data produced. Our suspicion comes from the fact that the respective test was conducted on a sample of only 27,919 individuals out of the 500+ million EU citizens, meaning that no more than 0.0055838% of citizens were interviewed. Furthermore, the sampling process did not sufficiently take into account the size of each state's population; for example, for a population of 18,246,731 Romanians the selected sample was of 1,013 individuals, the same as in the case of Spain, with a population of over 39 million, while in the case of Hungary, with a population of 8,320,614, and Latvia, with a population of 1,447,866, the number of the interviewed citizens was 1,012 and 1,011, respectively.

[#] A complete picture of the magnitude and severity of physical inactivity, obesity and their consequences can be found in the WHO report on non-communicable diseases worldwide in the year 2010 (9).

[&] In our view, the massive expenses produced by the fight against obesity and sedentariness, which have so far proved useless, should also be included among indirect losses.

* * *

După sinistra tragedie din 30 octombrie 2015, de la Clubul „Colectiv" - eveniment care până la momentul în care redactăm acest material s-a soldat cu 64 de morţi şi nimeni nu mai ştie/spune precis câţi răniţi - s-au lansat tot felul de sloganuri, care mai de care mai inspirat: corupţia ucide, nepăsarea ucide, incompetenţa şi ipocrizia ucide, birocraţia ucide etc. Avându-şi sorgintea într-o sinceră şi îndreptăţită indignare, aceste sloganuri îşi vor pierde cu

timpul nu valabilitatea, ci actualitatea, ele fiind inevitabil condamnate la uitare. Şi asta întrucât alte şi alte evenimente şoc şi întâmplări oripilante vor surveni, iar acestea vor trebui să genereze şi ele noi sloganuri, noi ţipete de revoltă.

Ne punem însă întrebarea: de ce doar tragediile violente, evenimenţiale, trebuie să fie percepute - uneori poate chiar supradimensionat - ca meritând a primi riposte imediate, concrete, dure şi, cel puţin în aparenţă, adecvate/eficiente? De ce fenomenele permanente, întâmplările „cronice" – accidentele de circulaţie, fumatul şi mai ales inactivitatea fizică, sedentarismul, care generează obezitate, această „catastrofă care se desfăşoară cu încetinitorul" (1) – nu primesc replici atât de viguroase, adică „nu se bucură" de o atat de mare şi intensă atenţie, şi nu generează adevărate revolte sociale?

La această mirare logică ni se va răspunde că, de fapt, şi vis-a-vis de aceste fenomene se ia atitudine, se stabilesc măsuri, se concep programe, se impun reguli, care vizează şi de la care se aşteaptă diminuarea impactului şi efectelor lor nedorite, reducerea sau chiar înlăturarea consecinţelor lor în planul sănătăţii şi al calităţii vieţii indivizilor, a populaţiei în general. Ceea ce nici nu este neadevărat. Numai că intensitatea şi vizibilitatea acestor „replici" sunt disproporţionat de reduse faţă de pericolul pe care fenomenele în cauză îl reprezintă, iar pe de altă parte, de cele mai multe ori, ideile, măsurile, programele, acţiunile respective îi angrenează doar pe cei implicaţi profesional (pe unii dintre aceştia mai mult formal, nefiind deloc o raritate ca antifumătorii să fumeze, apologeţii activităţii fizice să fie sedentari, poliţiştii de la circulaţie să încalce regulile etc), la cei vizaţi, la indivizii obişnuiţi, ajungând doar lozinci sau sfaturi insipide, rutiniere, condamnate din start la ignorare. Aşa se explică şi neconştientizarea gravităţii şi inevitabilităţii riscurilor pe care fenomenele sau comportamentele la care ne referim le incumbă, de către majoritatea populaţiei şi, desigur, lipsa rezultatelor dorite.

Ideea existenţei unei legături indisolubile, condiţionante între activitatea fizică şi sănătate, este atât de veche şi răspândită, încât a devenit de multă vreme un loc comun. Iar azi, dacă dai căutare cuvintele «physical activity health», în 0,49 secunde Google îţi afişează 180 de milioane de rezultate. În ce ne priveşte, despre evoluţia acestei idei şi despre argumentele pe care ea se sprijină, am scris cu mai multe ocazii; prima oară cu aproape 2 decenii în urmă, în lucrarea publicată sub egida Federaţiei Române „Sportul pentru Toţi" (Dumitru, 1997). În continuarea preocupărilor faţă de această temă, şi impulsionaţi de speranţa că – odată intraţi în UE – interesul şi realizările în planul sportului pentru sănătate vor căpăta alte dimensiuni şi în ţara noastră, am publicat mai multe materiale, cele mai consistente fiind cele din urmă cu 9 ani (Dumitru, 2007a; Dumitru, 2007b). La acel moment speranţele fiindu-ne hrănite şi de numeroasele iniţiative, proiecte şi programe, pe care Consiliul Europei şi Comisia Europeană, în colaborare cu OMS Europa, le lansau într-o frenezie (a se vedea în acest sens bibliografia celor două articole).

Astăzi ne aflăm deja la cel puţin un deceniu de la acele iniţiative, proiecte şi programe ce se vroiau dătătoare de mari speranţe. Un deceniu în care efectele acelor idei şi măsuri ar fi trebuit să înceapă a deveni palpabile; adică să avem măcar semne că anumite tendinţe alarmante au început a fi stopate, şi că cifrele care-i speriaseră atunci pe decidenţii de la toate nivelurile au început să fie mai puţin sumbre.

Cum stau însă lucrurile în realitate azi? Ce mesaje ne transmit documentele elaborate/emanate în ultima vreme, de către structurile europene menţionate mai sus, şi/sau de pletora lor de salariaţi şi colaboratori foarte bine plătiţi? Câte certitudini găsim în analizele pe care aceste structuri le-au finanţat cu mare dărnicie, şi câtă încredere putem avea că iniţiativele, proiectele şi programele pe cale de lansare/implementare vor fi altfel decât cele de până acum, adică într-adevăr eficiente? Concret, mai putem spera, şi dacă da, peste cât timp, că obezitatea va fi decăzută din statutul de endemie, la care a ajuns tocmai din cauză că ceea ce s-a propus şi s-a înfăptuit până acum a fost „apă de ploaie", adică o mare şi costisitoare - nu numai în bani, ci şi în timp, pe care nu se ştie dacă-l vom mai putea recupera vreodată! - păcăleală? Şi că, la nivel global vorbind, inactivitatea fizică nu va mai ucide anual milioane şi milioane de semeni de-ai noştri?

Analiza pe care o propunem în cele două editoriale pe care le-am proiectat reprezintă un demers ce-şi doreşte să răspundă mai mult sau mai puţin direct la acest tip de întrebări şi dileme, foarte concrete şi evident stringente. Ea se vrea un demers prudent, dubitativ, cât de obiectiv posibil, în care, spre deosebire de ce ni s-a întâmplat în cazul articolelor din 2007, să fie redus la minimum riscul de a ne entuziasma facil, atunci când citim/aflăm despre proiecte şi programe pompoase, pline doar de intenţii bune, dar nu şi de soluţii eficiente.

Când vorbim de inactivitatea fizică şi de înspăimântătoarele ei consecinţe, nu trebuie să uităm, în nici un moment, că în spatele diferitelor analize şi situaţii statistice care se vehiculează, se află în fapt oameni. Oameni vii, oameni ca şi noi, persoane cu individualităţi precise, pentru care sedentarismul, cât şi terifiantele lui urmări, reprezintă chestiuni cât se poate de concrete, realităţi de zi cu zi, generatoare de suferinţe fizice dar şi de spaime şi trăiri interioare dintre cele mai frustrante. Totuşi, întrucât demersul nostru nu poate face abstracţie de date, vom reţine în cele ce urmează câteva statistici pline de semnificaţie, din perspectiva întrebărilor şi intenţiilor mai sus formulate.

Obezitatea - piatră de încercare pentru destinul biologic al speciei umane?

Aşadar, telegrafic vom menţiona doar că în 2008, la nivelul Regiunii Europa a OMS (care înseamnă nu numai UE, ci un total de 53 de ţări), peste 50% dintre bărbaţi şi femei erau supraponderali, iar 23% dintre femei şi 20% dintre bărbaţi erau obezi. Strict pentru UE, cu inerente diferenţe de la ţară la ţară, ultimele estimări arată că supraponderalitatea afectează între 30 şi 70%, iar obezitatea între 10 şi 30%, dintre adulţi (5). Cât despre copii, până la 33% dintre cei de 11 ani şi până la 27% dintre cei de 13 ani sunt supraponderali sau obezi (4).

Îngrijorarea provocată de valorile brute este amplificată notabil de datele privite în evoluţie. Asta deoarece, la nivel global, obezitatea s-a dublat aproape între 1980 şi 2008, iar în Regiunea Europeană OMS numărul copiilor supraponderali a crescut continuu între 1990 şi 2008 (5). Pe de altă parte, în această regiune OMS, din 2002 şi până

în 2010 numărul ţărilor în care peste 20% dintre copii erau supraponderali a crescut de la 5 la 11 (14), iar ponderea copiilor supraponderali (incluzându-i aici şi pe cei obezi) de 6-9 ani a crescut de la 1 la 4 la 1 la 3 în doar în 2 ani, respectiv din 2008 şi până în 2010 (Storcksdieck Genannt Brosmann, 2014), ceea ce este de-a dreptul alarmant, ştiut fiind că cel puţin 60% dintre copii supraponderali vor fi supraponderali şi ca adulţi, iar obezitatea la copii se corelează foarte puternic cu factorii de risc cardiac, diabetul de tip 2, problemele ortopedice, tulburările mentale, rezultate şcolare slabe şi stimă de sine redusă.

În ce priveşte România, o estimare OMS din 2008 arăta că 53,1% bărbaţi şi 49,1% femei erau supraponderali, iar 16,9% bărbaţi şi 21,2% femei, aveau obezitate. Conform unui model predictiv al OMS însă, în 2020 doar 12% bărbaţi şi 9% femei, iar în 2030 doar 15%, respectiv 10%, vor fi obezi (4), cifre care, în opinia noastră cel puţin, sunt evident nerealiste, fantasmagorice. De altfel, ele sunt clar contrazise de rezultatele „Studiului ORO" (2), realizat în 2014 pe 2100 persoane, care a găsit că 21,3% (23% bărbaţi şi 20,3% femei) dintre românii de peste 18 ani suferă de obezitate, rata obezităţii crescând cu vârsta; 9,9% între 18 şi 39 ani, 30,1% între 40 şi 59 ani şi 41,6% la cei de peste 60 de ani. Cât priveşte supraponderalitatea la întreaga populatie de peste 18 ani, ea este de 41,6% la bărbaţi şi 24,7% la femei. Că obezitatea la români nu prea are cum să scadă o sugerează şi faptul că în 2014, la medicii de familie au fost înregistrate 52 868 cazuri noi de obezitate (1), precum şi constatarea recentă că, după cum vom vedea mai încolo, între membrele UE ţara noastră se plasează printre cele în care inactivitatea fizică are incidenţa cea mai ridicată (7).

Activitatea fizică – ajutorul cel mai de nădejde, dar tot mai neglijat în lupta cu obezitatea

Obiectivele prezentului material şi perspectiva din care este structurat ne determină să considerăm că nu este cazul să înşiruim motivele pentru care omul are nevoie de activitate fizică şi ce beneficii îi aduce ea. Ele sunt foarte mult popularizate, inclusiv în revista noastră - amintim spre exemplu ultimul editorial (Bocu, 2016) - şi destul de bine cunoscute, chiar şi de către sedentarii cei mai înrăiţi. Vom puncta de aceea aici doar câteva date referitoare la incidenţa inactivităţii fizice, pe de o parte, şi la consecinţele şi costurile inactivităţii fizice la nivel de societate, pe de altă parte. Date care, în mod indirect dar suficient de persuasiv, ne vor face să înţelegem de ce noi, ca indivizi responsabili, trebuie să adoptăm, benevol şi pentru totdeauna, un stil activ de viaţă, precum şi de ce statele şi organismele cu responsabilităţi în sănătate sunt din ce în ce mai preocupate, alarmate chiar, de statisticile privitoare la inactivitatea fizică.

Astfel, în ultimul deceniu şi jumătate Comisia Europeană a efectuat 3 Eurobarometre, la nivelul ţărilor membre: în 2002, în 2009 şi în 2013[$], datele ultimului dintre ele fiind analizate şi în cadrul primei întâlniri a reţelei punctelor focale naţionale responsabile de activitatea fizică, în octombrie 2014. (8). În esenţă, această cea mai recentă estimare privind nivelul de activitate fizică al cetăţenilor UE a evidenţiat următoarele: ♦ 59% dintre ei nu au făcut efort fizic sau nu au practicat un sport niciodată, sau au făcut-o foarte rar, ♦ 54% nu prestaseră nici o activitate fizică foarte viguroasă, iar 44% niciun fel de activitate fizică moderată în săptămâna ce precedase interviul, în timp ce ♦ 13% nu merseseră pe jos 10 minute încontinuu nici măcar o singură dată în ultima săptămână. Comparaţia cu datele Eurobarometrului din 2009 arată că situaţia din 2013 nu ar fi substanţial diferită, deşi îngrijorează faptul că procentul celor ce nu au făcut niciodată efort fizic sau sport a crescut cu 3% (7). De altfel, din datele OMS rezultă că în Regiunea Europeană a acestei organizaţii întâlnim şi procentul cel mai mare din lume de indivizi care petrec peste 4 ore pe zi în activităţi şezând pe scaun.

Situaţia nu este dădătoare de speranţe nici la copii, de vreme ce în 2010 (13) doar 22% dintre fete şi 30% dintre băieţii de 11 ani din Regiunea Europeană OMS prestau o oră de efort fizic moderat-intens pe zi, iar în 2012 doar 1 din 5 copii din UE efectuau cu regularitate efort fizic moderat-intens (6). Dar poate mai alarmant este faptul că inactivitatea fizică tinde să crească dramatic între 11 şi 15 ani, şi în special la fete. Spre exemplu, în România (citată alături de Austria, Irlanda şi Spania), nivelul activităţii fizice este cu peste 60% mai scăzut la fetele de 15 ani, comparativ cu fetele de 11 ani (ibidem).

Cât priveşte situaţia adulţilor de la noi, Eurobarometrul din 2013 nominalizează România printre ţările cu pro-centul cel mai mare de persoane care nu fac nici un fel de activitate fizică sau sport: 60%, ca şi Italia. Deşi, dacă asta ne poate încălzi, sunt ţări care stau şi mai rău: Bulgaria (78%), Malta (75%) şi Portugalia (64%) (7).

Dacă o lungă perioadă de timp, singurele date care se colectau şi se făceau publice erau exclusiv de genul celor de mai sus, de la o vreme apar tot mai multe materiale care pun foarte concret problema importanţei activităţii fizice nu doar pentru individ, ci şi pentru sistemele de sănătate şi pentru economie şi societate, în general. Este vorba de analize şi calcule care evidenţiază consecinţele obezităţii şi inactivităţii fizice, în termenii dureroşi ai pierderilor de vieţi omeneşti, dar şi în cei arizi-contabiliceşti, ai costurilor, ai poverilor financiare la care conduce incidenţa crescută a sedentarismului cronic în populaţie[#].

Astfel, în momentul de faţă inactivitatea fizică a ajuns să reprezinte al 4-lea factor de risc de mortalitate, stând la baza a 6% dintre toate decesele de pe glob. Lucru uşor de înţeles dacă ne gândim că 30% dintre cardiopatiile ischemice şi 21-27% dintre cancerele de sân şi colon, precum şi 27% dintre cazurile de diabet o au drept principala cauză (10). Mai concret, la nivelul celor 53 de ţări incluse în Regiunea Europeană a OMS, nu mai puţin de 1 milion de decese îi sunt atribuibile în fiecare an (13), iar o sinteză a unei serii de articole publicate în revista Lancet, avansează cifra de 5,3 milioane decese anual, care ar putea fi evitate dacă toţi indivizii sedentari din lume ar deveni activi fizic; ceea ce înseamnă sensibil mai mult decât cele 5 milioane de decese cauzate an de an de fumat (11). În plan financiar, atrage atenţia ştirea că până la 7% din bugetele de sănătate din UE sunt consumate direct de boli legate de obezitate, la care se adaugă costuri indirecte şi mai mari, generate de scăderea productivităţii şi de decesele premature (3). Ce poate să însemne asta în cazul concret al unei ţari - e drept a 3-a din UE ca populaţie - ne face să înţelegem o estimare realizată pentru anul 2010 (N.B.!) la nivelul Marii Britanii: 1,06 miliarde lire costuri directe, provocate de cele 5 condiţii patologice legate în mod specific de inactivitatea fizică

(boala coronariană, accidentele cerebrale, diabetul, cancerul colorectal şi cancerul de sân), la care se adaugă pagubele indirecte [&]: 5,5 miliarde din concediile medicale şi peste un miliard din decesele premature (12).

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Deşi în cele de mai sus am reţinut doar o mică parte din extrem de numeroasele date existente, credem că este cât se poate de evident că omenirea se află deja într-un foarte mare şi nemaiîntâlnit impas; mai concret, într-o situaţie care riscă să devină curând una fără ieşire. Aceasta deoarece, filogenetic vorbind, umanitatea a atins un stadiu „evolutiv" în care incidenţa şi agresivitatea obezităţii şi inactivităţii fizice mai pot (ne putem pune inclusiv întrebarea, daca într-adevăr mai pot !) fi controlate doar prin alte tipuri de strategii şi măsuri decât cele amatoriste şi paliative de până acum. De ce s-a ajuns aici, în condiţiile în care pericolele respective au fost evidenţiate şi conştientizate de cel puţin două decenii, iar în tot acest timp adevărate armate de oameni (specialişti) au fost mobilizate şi sume enorme de bani au fost prăpădite, dar mai ales ce ar trebui schimbat în abordarea acestor fenomene care ameninţă efectiv fondul biologic al speţei umane, urmează să vedem în numărul viitor al revistei.

***** Prezentul material face parte dintr-un ciclu de două editoriale, continuarea lui urmând să apară în viitorul număr al revistei noastre.

[$] Deşi cu siguranţă, tehnic vorbind, Eurobarometrul respectiv este ireproşabil, nu putem să nu ne punem întrebări cu privire la relevanţa şi validitatea reală a rezultatelor sale. Suspiciunea noastră vine din faptul că el a luat în calcul doar 27 919 indivizi, din cei peste 500 de milioane de cetăţeni UE, ceea ce înseamnă că numai cel mult 0,0055838% dintre cetăţeni au fost intervievaţi. Mai mult, eşantionarea pare a fi ţinut insuficient seama de populaţia ţărilor; de exemplu, la o populaţie de 18 246 731 cetăţeni ai României, volumul eşantionului a fost de 1013 subiecţi, la fel ca şi în cazul Spaniei, a cărei populaţie era de peste 39 milioane, în timp ce din cei 8 320 614 ai Ungariei sau cei 1 447 866 ai Letoniei, au fost intervievaţi 1012, respectiv 1011 cetăţeni.

[#] O imagine completă asupra amploarei şi gravităţii consecinţelor inactivităţii fizice şi obezităţii găsim în raportul OMS privind situaţia bolilor necomunicabile pe glob, la nivelul anului 2010 (9).

[&] Tot pagube indirecte, în viziunea noastră, ar trebui considerate şi enormele cheltuieli cu „lupta împotriva obezităţii şi sedentarismului", dovedite a fi făcute degeaba până acum.

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The role of exercise in the postoperative rehabilitation of patients with Dupuytren's disease

Rolul efortului fizic în recuperarea postoperatorie a pacienților cu Boala Dupuytren

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Abstract

Background. Dupuytren's disease is a chronic idiopathic benign and proliferative disorder of the palmar and digital aponeurosis of the upper limbs, with progressive evolution, causing flexion contracture of the fingers. The disease predominantly manifests in the male sex, particularly after the age of 40. Early onset is an aggressive evolution marker, except for non-Dupuytren's disease, which can occur at any age and has a stationary evolution, depending on the action of the trauma. A number of sports branches such as rock climbing and athletics are predominantly affected, but the disease may also develop in other repetitive palmoplantar contact sports. Treatment can be topical, injectable or surgical for advanced cases with functional impotence. Rehabilitation has a demonstrated role in sports reintegration.

Aims. The aim of the study is to evidence risk groups for Dupuytren's disease, as well as prophylaxis, treatment and the role of post-treatment rehabilitation.

Methods. The article will attempt to delineate the cases occurring in patients; compared to Dupuytren's disease, which develops after the fourth decade of life, minimally invasive topical or injectable treatment is most frequently sufficient for stationary non-Dupuytren's disease cases.

Results. Physical overstrain of the hand was present in all patients showing disease extension, after surgical treatment. The only impact variables were the presence of family loading and advanced patient age, regarding the evolution towards recurrence of Dupuytren's disease.

Conclusions. Postoperative results concerning the functional recovery of patients with more severe forms of Dupuytren's disease are more favorable when physiokinesitherapy is associated.

Key words: Dupuytren's disease, non-Dupuytren's disease (NDD), exercise

Rezumat

Premize. Boala Dupuytren este o afecțiune idiopatică cronică, benignă și proliferativă a aponevrozei palmare și digitale a membrelor superioare, cu evoluție progresivă, determinând contractura în flexie a degetelor. Boala se manifestă cu precădere la genul masculin, fiind întâlnită mai ales după vârsta de 40 de ani. Debutul precoce este un marker de evoluție agresivă exceptând sindromul non-Dupuytren disease, care debutează la orice vârstă și are o evoluție staționară, dependentă de acțiunea traumei. Diferite ramuri sportive sunt afectate cu precădere, cum ar fi alpinismul, atletismul, dar ar putea apărea și la alte sporturi de contact repetitiv palmo-plantar. Tratamentul poate fi topic, injectabil sau chirurgical, pentru cazurile avansate cu impotență funcțională. Recuperarea are un aport demonstrat in reintegrarea sportivă.

Obiective. Obiectivul studiului este evidențierea unor grupe de risc pentru boala Dupuytren, profilaxia, tratamentul și aportul recuperării posttratament.

Metode. Articolul va încerca o delimitare a cazurilor apărute la pacienți; față de boala Dupuytren, care apare dupa decada a patra, tratamentul topic sau injectabil, minim invaziv este de cele mai multe ori suficient pentru cazurile staționare cu apartenență la sindromul non-Dupuytren's disease.

Rezultate. Suprasolicitatea fizică a mâinii a fost prezentă la toți pacienții prezentând extensia bolii, după cura chirurgicală. Singurele variabile de impact sunt prezența încărcăturii familiale și vârsta ridicată a pacienților, în ceea ce privește evoluția spre recurență a bolii Dupuytren.

Concluzii. Rezultatele postoperatorii în ceea ce privește recuperarea funcțională a pacienților cu forme mai severe de boală Dupuytren sunt mai favorabile prin asocierea fiziokinetoterapiei.

Cuvinte cheie: Dupuytren's disease, non-Dupuytren's disease (NDD), efort fizic.

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Introduction

Dupuytren's disease (DD) is a benign fibroproliferative disease affecting subcutaneous palmodigital tissue, which is responsible for nodules and cords, being accompanied in the long term by progressive retraction and flexion contracture, with the gradual loss of hand function. It is one of the most frequent fibromatoses with hereditary transmission. The development of plantar fibromatosis is an ectopic disease that is more common in athletes, as a result of injuries, repeated plantar trauma or overstrain of this region. A number of factors have been involved in the development of DD: the geographical area, patient gender, advanced age, family history, alcohol, smoking, physical overstrain, a history of trauma, high serum lipid levels and comorbidities such as diabetes mellitus, rheumatoid disease, epilepsy, liver cirrhosis, HIV/AIDS (Nicula, 2015).

Various sports have been incriminated in the acceleration of the disease, including rock climbing (Logan et al., 2005) and athletics (Heim et al., 1987), according to the same pattern of repeated trauma of the palmar fascia (Kirsch, 1975) and plantar fascia, respectively, or infectious inoculation as a trigger of the disease (Mandal & Fahmy, 2006). The disease may also occur in gymnasts, tennis players, weight lifters, cross-country skiers. A proportion of 19.5% of men who practiced rock climbing had pathognomonic DD lesions with an earlier onset compared to the general population (Logan et al., 2005). Recent studies consider DD to be a systemic connective tissue disease, characterized by subtle biochemical changes that generate ectopic fibrous deposits. The theory is based on the observation of an association of palmar contracture, with or without the involvement of proximal interphalangeal joints, with connective tissue accumulation in the elbow, sole, auricle and penis.

Although it is considered that the majority of patients are descendants of the Northern European population (Ross, 1999), general prevalence varies between 0.2-56% (Hindocha et al., 2009), depending on the geographical area. Prevalence also varies depending on racial groups; the disease is most frequent in the Caucasian race, less frequent in Afro-Americans, with similar disease characteristics, and most rare in Asian populations (Saboeiro et al., 2000). General prevalence in the Northern European population is over 17% (Seegenschmiedt, 2012), while in the North American population it is between 1-7.3% (Dibenedetti et al., 2011).

Onset age is 45-65 years, being higher in the female sex, a situation that is reversed in the Asian Chinese population, where Yeh et al. (2015) report a mean age of 53 years for women and 60 years for men. The disease prevalence is in a direct relation with advanced age, and early onset predisposes to a more severe and debilitating evolution. Although extremely rarely, studies have evidenced disease cases in children, before the age of 13 (Urban et al., 1996).

Regarding the influence of gender on the prevalence of the disease, this is more frequent in males (Hindocha et al., 2006), with a female/male ratio varying from 1/1.5 to over 1/10 (Lanting et al., 2013; Brouet, 1986) depending on the age group and geographical area, so that in the 8th decade of life, the ratio becomes 1:1.

Causes

a) Physical overstrain of the hand

Dupuytren was the first to report the association of the disease with professions that involve an overstrain of the hand. The best known counterargument was provided by Goyrand almost two centuries ago, which consisted of the development of bilateral disease in the case of a hospital manager (Goyrand, 1833). The controversy over the implication of cumulative work exposure seems to incline towards evidence of a dose-effect relationship (Degreef et al., 2008). In another study, both occupational exposure to vibrations and hard manual work without significant exposure to vibrations were associated with DD (Descatha et al., 2012). The presence of a vibratory overstrain of the hand associated with an increased incidence of the disease as well as with a dose-effect correlation is unanimously accepted (Palmer et al., 2014) .

b) Trauma

The first observations related to a possible risk of trauma for the development of DD were made by Hueston (1968) and Hart & Hooper (2005), who described the disease after a distal radius fracture. Other studies followed, some of which reporting algodystrophy as a cause, others immobilization of the hand as a treatment for trauma (Livingstone & Field, 1999). There is currently no consensus about the importance of these factors in the etiology of Dupuytren's disease (Klingenberg & Boeckstyns, 2011), or the presence of a single trauma.

In some Eastern European countries, the disorder is considered to be an occupational disease (Brenner & Krause-Bergmann 2001), while in others, it is not correlated with manual work or hand trauma (McFarlane, 1991). However, there is general consensus about the fact that one lesion cannot cause the disease, but may precipitate the unfavorable evolution of genetically predisposed individuals.

Diagnosis

McFarlane proposed a number of criteria for the diagnosis of DD, secondary to trauma (McFarlane & Shum, 1990):

1. The first presentation to the doctor before the age of 40 in men and 50 in women.
2. Bilateral disease occurring in patients without hand trauma, before the age of 40 in men and 50 in women.
3. Objective signs of hand trauma.
4. Disease evolution predominantly in the area affected by the trauma.
5. Development of the disease within 2 years of trauma.

From a *clinical* point of view, the disease presents the following types of elements, with progressive chronological development (McFarlane, 1974):

Dupuytren's nodules, McFarlane (cited by Khashan et al., 2011), (von Campe et al., 2012)

Skin umbilication

Skin thickening

Flexion contractures

Cords

The types of cords found in Dupuytren's disease are multiple:

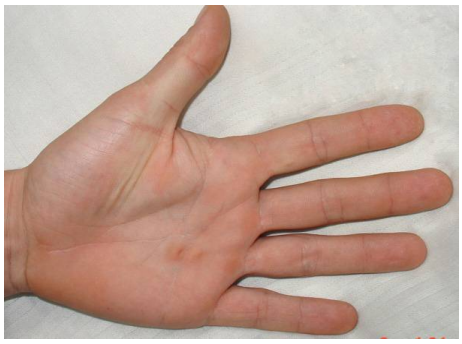
- *Pretendinous cord*

- *Spiral cord* (Umlas et al., 1994)
- *Natatory cord* (McFarlane, 1990)
- *Central cord*
- *Lateral cord*
- *Fifth finger abductor cord* (Missfelder et al., 1990)
- *Retrovascular cord*
- *Distal and proximal commissural cords* (McFarlane, 1985)
- *Thumb pretendinous cord*

In the fingers, the most frequently found cords are central, spiral and lateral ones. They are responsible for the distortion of proximal interphalangeal joints (Anderson et al., 1999).

More recent studies have demonstrated the presence of a different nosological DD entity, which, through the similarity of its clinical manifestations to the studied pathology, generates erroneous epidemiological results. The parallel entity to DD, generically termed non-Dupuytren's disease (NDD) (Rayan, 2005), can be differentiated from this based on the following characteristics:

- *ethnic distribution of the disease*: while DD occurs particularly in the Caucasian race, NDD can be found in a very wide range of ethnic groups;
- *uni/bilaterality*: if DD can develop bilaterally, NDD is characterized by unilaterality and in general, location in one finger;
- *etiology*: in general, NDD is most frequently associated with obvious trauma, while DD is characterized by a multifactorial mechanism;
- *treatment*: if in DD treatment is essentially surgical, NDD generally has self-limited forms, which require surgery only in exceptional cases (Fig. 1a, b).


a

b

Fig. 1 – Typical nodular lesion in the fourth finger, developed unilaterally in a young patient aged 27 - non-Dupuytren's disease (NDD) - 10 years after superselective fasciectomy.

Selection criteria for treatment in Dupuytren's disease

1. Conservative treatment

In the case of patients with stationary DD, with minimal contracture without functional impairment, a wait-and-see approach and ambulatory monitoring are indicated.

Calcium channel blockers: nifedipine and verapamil can be indicated for early disease stages (Rayan et al., 1996), while clostridial collagenase is indicated for advanced stages (Peimer et al., 2015).

Another disease suppression method consists of intranodular steroid injections (Ketchum & Donahue, 2000) .

Other authors recommend intralesional interferon γ injections, which are attributed a role in improving symptoms and reducing lesion size both in DD and hypertrophic scars.

2. Surgical treatment

It is the therapeutic method of choice in the case of advanced stage DD. A flexion contracture of the metacarpophalangeal joint greater than 30° and of the proximal interphalangeal joint greater than 15-20° represents a treatment indication, particularly when associated with the presence of a prominent cord.

a) Subcutaneous fasciotomy (Crean et al., 2011; Smith, 2014; Henry, 2014; Pess et al. 2012; Corradino et al., 2013; Hovius et al., 2015)

b) Fasciectomies

- *Limited fasciectomy* (McFarlane, 1995) (Fig. 2a,b,c)
- *Limited selective fasciectomy* (Goyrand, 1834)
- *Segmental fasciectomy* (Degreef, 2011)
- *Complete or total fasciectomy* (McIndoe & Beare, 1958)

The open palm technique - Mc Cash (Guilhen et al., 2014) described the technique, with transverse incisions at the level of the flexion folds, partial aponeurectomy, healing *per secundam*.

- *Dermofasciectomy* (Henry, 2014)

c) Immobilization in extension (Isel & Celerier, 2010).

d) The continuous elongation technique (TEC) using the TEC device for severe Dupuytren's contracture of the fingers (Messina & Messina, 1993; Beyermann et al., 2002)

e) Salvage procedures, Moberg (1973) cited by Isel & Celerier (2010), (Werker, 2012)

f) Amputation (Degreef & De Smet, 2009)

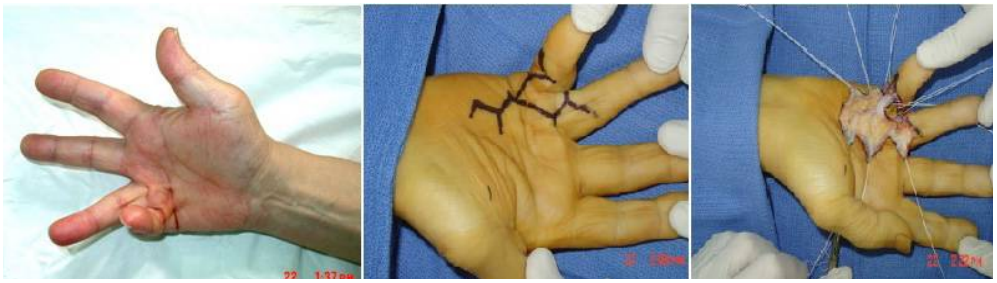
g) Wound closure

The postoperative rehabilitation of patients with Dupuytren's disease. The role of rehabilitation treatment

Occupational therapy along with physiotherapeutic support makes postoperative rehabilitation possible in the majority of the cases.

The most frequent postoperative complications are joint stiffness and loss of preoperative flexion and extension. Although there are no methods to prevent or limit disease progression, nocturnal extension orthoses and regular physiotherapeutic exercises are useful in the postoperative rehabilitation period (Bayat & Mc Grouther, 2006).

The general principles of postoperative care for DD disease are the following: the patient is examined the next



a b c

Fig. 2 – Patient with simultaneous involvement of the fourth and fifth fingers and fourth finger contracture, visible during abduction of the fingers. Images during preoperative and intraoperative examination.

day, in dorsal decubitus, in order to control anxiety and possible triggering of vasovagal reflexes. If the dressing is adherent to the wound, physiological serum or sterile water is applied abundantly, and after 5-10 minutes the dressing is carefully detached, and potential drains are removed. After the wound dries, several days postoperatively, petroleum jelly or antibiotic ointments can be applied. Mupirocin ointment is preferred to other ointments due to the low incidence of allergic contact dermatitis (Sheth & Weitzul, 2008). The wounds are redressed with gauze compresses and the fingers are dressed individually, then they are conformed into an antebrachio-manual orthosis in neutral position, with a metacarpophalangeal joint flexion of 35-45° and relative finger extension. Only the operated fingers will be immobilized in the orthosis, if possible.

After a day, the patient returns for wound care and initiation of early mobilization, with progressive exercises. At this point, the hand can be washed in the sink with a mild hypoallergenic soap, then the wound is disinfected and dressed as before. The patient is instructed to execute active flexions within the limits of the orthosis; however, as a general rule, if pain increases as the session progresses, this means that the exercises have exceeded the physiological threshold.

During postoperative weeks 2-3, flexion-extension exercises are performed progressively; the therapist starts with passive movements of the proximal interphalangeal and distal interphalangeal joints, with axial traction. These can be performed with volar finger splints, up to 4-5 times per day, for maximum 15 minutes. Electrostimulation can be used for neuromuscular reeducation and stimulation of tendon gliding. Starting with week 3, it can also be applied to extension, with the blockage of the metacarpophalangeal joint and the exclusive stimulation of the joint.

The sutures are removed after at least 2 weeks, unless intolerance or local infection develops, in order to prevent wound dehiscence. They can be maintained for 3 weeks in diabetic patients. After the sutures are removed, the scar can be covered with a longitudinal protection band, along the tension lines, which can be changed after shower. If the scar is extremely sensitive or hypertrophic, silicone bands can be applied directly to the scar during the night (Davis & Eaton, 2012).

Immobilization is discontinuous during the third week, and the nocturnal orthosis is replaced with a volar device that immobilizes the proximal interphalangeal and the distal interphalangeal joints (Isel & Celerier, 2010).

Hypothesis

Efficiency of postoperative recovery treatment in the functional rehabilitation of the hand, by using physiokinesitherapeutic procedures consisting of immobilization in extension alternating with passive and active physical exercises.

Material and methods

Research was performed with the patients' informed consent and with the approval of the Ethics Committees of the health care units where the studied patients were diagnosed and treated.

Research protocol

a) Period and place of the research

The study included 69 male subjects, with a mean age of 57.87 ± 1.8 years, who underwent surgical treatment for DD.

b) Subjects and groups

The subjects participating in the research presented to the following health care units: Surgical Clinic I, Military Hospital Cluj-Napoca, Clinic of Diabetes and Nutritional Diseases, Interservisan Clinic, Chişineu-Criş City Hospital, in the period 01.01.2004-31.12.2007, and were diagnosed with DD.

c) Tests applied

Diagnosis was made based on the following criteria: pathognomonic DD lesions, with the appearance of pathological processes by well defined anatomical pathways in the palmar aponeurosis, along longitudinal tension lines. The main affected structure was the fan-shaped insertion of the long palmar muscle or, in its absence, the palmar fascia joined with the deep antebrachial fascia, or the flexor volar retinaculum.

d) Statistical processing

Multivariate analysis and analysis of factors associated with disease extension.

Results

a) Analysis of factors associated with disease extension in the studied group

It shows that physical overstrain of the hand was present in all patients with disease extension after surgical treatment. In contrast, patients with a favorable local evolution reported physical overstrain of the hand only in 33.84% of the cases (22 patients). This factor was demonstrated to be a significant risk factor through

the following parameters: OR=9.7; 95%CI=1.0-88.9%, p=0.0173 (where OR is *odds ratio* and CI is *confidence interval* (Tables I & II).

Table I
Physical overstrain of the hand.

Physical overstrain of the hand	Extension present	Extension absent	Total	p
Present	4	22	26	0.0173
Absent	0	43	43	Re
Total	4	65	69	15.38%

Interestingly, vibratory overstrain was absent in patients with DD extension after treatment, patients reporting only mechanical overstrain of other nature. In the group of patients with favorable local evolution who reported an overstrain of the hand, this was vibratory in 10.3% of the cases, and of other causes in 89.7% of the cases.

Upper limb trauma were not validated as a risk factor in univariate analysis, being absent in the group with post-treatment DD extension and present in 10.8% of the cases in the group with favorable evolution (OR=0.9; 95%CI=0.9-1.8, p=0.489) (Table II).

Table II
Results of univariate analysis of possible factors involved in DD extension after surgical treatment.

Indicators	OR	95%CI	p
Gender (M)	1.50	0.10-15.5	0.425
Age	–	–	0.010
Environment (rural)	14.70	1.40-15.5	0.0255
Family history	0.70	0.07-7.70	1.000
Amount of alcohol	–	–	0.000
Smoking	0.35	0.05-2.71	0.303
Physical overstrain of the hand	9.70	1.00-88.9	0.0173
Upper limb trauma	0.90	0.90-1.80	0.489
Diabetes mellitus	0.90	0.90-1.01	0.4908
Hypercholesterolemia	1.60	0.20-12.10	0.646
Hypertriglyceridemia	1.70	0.20-12.9	0.600
Bilateral disease	16.50	1.50-17.9	0.0202
Degree of involvement	–	–	0.287
Type of surgical treatment	–	–	0.929
Extension of surgical treatment	–	–	0.091

b) Multivariate analysis

A multiple logistic regression model was developed by inclusion of the following variables: age, environment of origin, daily amount of alcohol consumed, physical overstrain of the hand, bilateral disease. Following analysis, rural environment and bilateral disease were considered as independent predictive factors (Table III).

Table III
Results of multivariate analysis of risk factors for DD extension after surgical treatment.

Indicator	p	OR	95.0%CI for OR	
			Lower	Upper
Age	0.400	1.15	0.83	1.60
Environment (1)	0.002	3.73	1.08	3.86
Alcohol consumption	0.145	1.04	0.99	1.10
Overstrain (0)	0.997	0.00	0.00	1.01
Bilateral disease (0)	0.027	2.17	1.01	2.95

c) Analysis of factors associated with disease recurrence in the studied group

Post-treatment, *physical overstrain of the hand* was present in symmetrical proportions in the group of patients with DD recurrence (62.5%) and in the group without this evolution pattern (59.0%). The risk potential of the factor was denied by the results obtained following analysis: OR=1.157, 95%CI=0.2533-5.289, p=0.8736 (Table IV).

Table IV
Physical overstrain of the hand.

Physical overstrain of the hand	Recurrence present	Recurrence absent	Total	p
Present	5	36	41	0.8736
Absent	3	25	28	*Re*
Total	8	61	69	12.20%

Also, the figures did not demonstrate an additional risk impact for vibratory overstrain of the hand (OR=0.8, 95%CI=0.8-1.9, p=0.586) in the development of recurrence after surgical treatment.

A history of trauma was reported by 2 patients in the group with DD recurrence (25%). In contrast, the group without this unfavorable evolution pattern in the long term reported the presence of trauma in a proportion of 8.19% (5 patients). However, differences did not reach the statistical significance threshold required for validation as a risk factor for DD recurrence after surgical treatment (OR=3.7, 95%CI=0.6-23.6, p=0.139).

All univariate analyses were centralized in Table V.

The figures show that the only impact variables are the presence of family loading and advanced patient age.

Table V
Results of univariate analysis of possible factors involved in the development of DD recurrence after surgical treatment.

Indicator	OR	95%CI	p
Gender (M)	0.3889	0.07-2.31	0.341
Age	–	–	0.043
Environment	2.085	0.2361-18.42	0.5666
Family history	16.72	1.917-145.9	0.003
Amount of alcohol	–	–	0.213
Smoking	0.5926	0.1269-2.7666	0.5221
Physical overstrain of the hand	1.157	0.2533-5.289	0.8736
Upper limb trauma	3.7	0.6-23.6	0.586
Diabetes mellitus	1.926	0.3348-11.08	0.4842
Hypercholesterolemia	0.5	0.1-2.6	0.384
Hypertriglyceridemia	0.5	0.1-2.7	0.783
Bilateral disease	0.864	0.1891-3.948	0.8736
Degree of involvement	–	–	0.261
Type of surgical treatment	–	–	0.523
Extension of surgical treatment	–	–	0.389

d) Multivariate analysis after surgical treatment

A multiple logistic regression model was built, which included the following variables: gender, age, environment of origin, family history, physical overstrain of the hand, bilateral disease. As shown in Table VI, the only factor with independent risk power was family history (Table VI).

Table VI
Results of multivariate analysis of risk factors for recurrence of Dupuytren's disease after surgical treatment.

Indicator	p	OR	95%CI for OR	
			Lower	Upper
Gender	0.295	0.33	0.04	2.66
Age	0.626	0.98	0.91	1.06
Environment	0.526	2.11	0.21	20.97
Family history	0.006	3.58	2.78	463.88
Overstrain	0.969	1.00	0.19	5.38
Bilateral disease	0.827	1.25	0.21	7.42

Discussions

Sports that involve repeated trauma of the palmodigital aponeurosis with sufficient rhythmicity can cause the development of DD specific lesions. These are more frequently NDD (non-Dupuytren's disease) lesions with earlier onset, evolution depending on persistence of the trauma, limited and efficient treatment (topical, injectable and rarely surgical). Repeated trauma found in certain sports are responsible for the higher prevalence and earlier onset of some NDD forms.

Unfavorable evolution manifesting by post-surgical DD extension is a subject that is little addressed in the literature. Our results suggest the presence of a risk pattern based on two elements:

a) A rural environment of origin. This risk factor, demonstrated as being independent, induces overexpression of other risk factors such as: intense use of the hands in daily physical activities, with their overstrain including after treatment, non-compliance with treatment. Within the limits of the small number of patients in whom post-surgical disease extension could be demonstrated, the results evidenced even higher degrees of involvement of the right hand, as the preferentially used limb. In the studied group, a more frequent involvement of the right hand was observed, 60% of the cases presenting specific DD lesions in the right hand.

b) Bilateral involvement as a severity marker suggests the impact of the genetic and/or molecular pattern of the disease in parallel to the impact of environmental and behavioral factors. Bilateral disease in the studied group was seen in 51.11% of all patients, with a slightly higher frequency in men. Some authors obtained relatively similar results. Hindocha et al. (2006) observed a 47% frequency of bilateral involvement in patients with DD recurrence, while Loos et al. (2007) found bilateral disease in 45.8% of patients (Fig. 3 a, b).

The environment of origin - rural, a family history of DD and physical overstrain of the hand were considered significant risk factors.

In a subsequent study, overstrain of the hand was found in 15 of the 21 studied patients, representing 71.42% of cases, and trauma were described in 5 patients, representing 23.80% of all cases. Physical overstrain of the hand was associated with progressive DD evolution after surgical treatment in 6 cases, representing 28.57% of operated cases with unfavorable evolution.

Five patients, representing 23.80%, had repeated trauma of the affected hand, most frequently caused by daily activities. Only 2 patients, representing 40% of patients with repeated trauma, had a progressive evolution of lesions after surgical treatment.

Pareto analysis of favoring extrinsic factors present in the preoperative period in patients with DD who underwent surgery and were followed up in the medium and long term postoperatively showed that alcohol consumption, smoking and overstrain of the hand represented over 80% of these factors.

The higher recurrence rates for the right hand can be explained by the high proportion of persons with a dominant right hand.

Although a great number of patients had risk factors for DD – chronic smokers, chronic alcohol consumers, physical overstrain of the hand, and they continued the same lifestyle postoperatively, it was observed that the presence of one or two risk factors did not significantly influence the development of recurrence or disease extension. The concomitant presence of 4 risk factors was associated with the development of recurrence after surgery.

Fig. 3 – Patient with bilateral involvement of the fifth finger and flexion contracture of 100° and 50°, respectively.

The role of physical exercise in rehabilitation

Active movements

Since the first postoperative visit, the patient is asked to make gentle, active movements with the fingers. The physical exercises used as part of postoperative rehabilitation are as follows:

1. blockage of the finger:
   a) active flexion of the proximal interphalangeal joint while maintaining the metacarpophalangeal joint in extension;
   b) active flexion of the distal interphalangeal joint while maintaining the metacarpophalangeal and proximal interphalangeal joints in extension;
2. active flexion of each finger up to the thenar eminence level;
3. active flexion of each proximal interphalangeal joint up to the palm level while maintaining all the other fingers in extension;
4. closing the fist;
5. abduction and adduction of the fingers;

6. extension of the fingers:
   a) active extension of the metacarpophalangeal joint;
   b) active extension of the proximal interphalangeal joint by maintaining the metacarpophalangeal joint in hyperflexion, using the unaffected hand;
7. complete movement of the wrist and thumb.

The exercise program usually comprises 10 repetitions of each exercise 3-4 times a day. This program can be adjusted; a smaller number of repetitions can be recommended for certain patients. Severe flexion contractures of the proximal interphalangeal joint of the small finger sometimes lead to compensatory hyperextension of the distal interphalangeal joint. For surgical correction of this type of contractures, proximal interphalangeal joint extension can be used, by fixation with Kirschner pins. Early mobilization in flexion of the distal interphalangeal joint will play an important role in restoring tendon gliding and realigning segments (Fiettti & Mackin, 1995).

As movement improves, exercises will change, acquiring a higher degree of precision. Usually at about 2 postoperative weeks, exercises favoring tendon gliding can already be initiated. These optimize the movement of the flexor tendon and implicitly, joint movement.

Active use of the hand is encouraged by occupational therapy. Even when the wound is still open, prehension movements of the fingers can be initiated. Following wound closure, 4 weeks after performance of the open palm technique or at 2-3 weeks, after primary suture, sustained exercises for strengthening palmar structures by flexion-extension movements are progressively added to the physiotherapy program. In patients with skin grafts, these types of exercises are added only when the degree of local scar formation allows it. These exercises are recommended in at least 5 sessions with 15-20 repetitions (Davis & Eaton, 2012).

Physical overstrain will be avoided, because it can generate pain and edema. Movement resistance will also increase progressively, with the increase of tolerance (Salvo, 2014).

Passive movements

For joint stiffness or limitation of active tendon movements, gentle passive movements can be included in the physiotherapy program to maintain joint mobility. If the passive flexion of one or several proximal interphalangeal joints is limited, gentle orthosis immobilization can be required. The orthosis is applied on the volar side, to the proximal interphalangeal joints and the metacarpophalangeal joints. The patient will be encouraged to adjust tension in the orthosis until traction of the affected joints is felt. Residual contractures after percutaneous fasciotomy can respond favorably to nocturnal splint immobilization, according to Meinel (Meinel, 2012).

A number of physiotherapy techniques have been designed to improve postoperative flexion and extension, including the use of an elastic band, which maintains both categories of joints in a flexed position under slight tension. Patients must be instructed throughout the physiotherapy program to correctly use movements and immobilization means. Patients will be explained how to watch for color changes in the finger pulp, exacerbation of edema and development of paresthesia, in which case they will have to reduce orthosis tension (Walsh, 2011).

Management of the postoperative wound

After wound healing, lanoline massage to hydrate the scar and maintain its mobility has proved useful. Other excipients, including onion extract gel, or hot compresses have also demonstrated their efficiency. Massage of the palms and fingers is performed before each physical exercise session. Movements will be rhythmic, circular, similar to gentle taps along the scar.

For scar management, silicone gel or patches applied along the scar, sealing it and causing compression, are currently used. Their advantage is due to the plastic properties of silicone, which allows to obtain a cast with constant pressure on all scar areas. If additional pressure is required, a palmar orthosis will also be applied over the elastomer. If the scars are dull, non-reactive, the elastomer will be removed. For patients with occupations that involve manual work, changing the workplace or discontinuing work for at least 3-4 months and occupational therapy are recommended (Walsh, 2011).

Physiotherapy methods

Physiotherapy, using hot or cold procedures, is useful in the postoperative treatment of patients with DD. Heat applied as packs, fluid therapy or paraffin baths is useful in increasing scar and soft tissue extensibility and in reducing pain and functional impotence. Used before physical exercise, heat considerably improves the results of the efforts made by the patient. Used after physical exercise, hot packs can reduce pain and edema. Alternating baths have also proved their utility in edema and pain control. The technique of alternating baths involves immersion of the hand in cold water at temperatures of 12-18°C for one minute, followed by immersion in water at body temperature for 3 minutes. During water immersion, the patient is asked to squeeze a sponge, followed by extension of the fingers. This alternating sequence is repeated for 10 minutes, stimulating circulation and facilitating improvement of edema.

Conclusions

1. From a therapeutic point of view, limited partial fasciectomy remains the safest surgical procedure, with a low recurrence rate and risk of progressive evolution after therapy, for Dupuytren's disease forms.
2. The long-term postoperative results of the patients included in this study were satisfactory.
3. The long-term satisfaction of patients with DD treated by surgical methods is correlated with the favorable postoperative results.
4. Rehabilitation therapy as a component of multidisciplinary treatment can be effective in terms of quality and extension of functional recovery.

Conflicts of interests
No conflict of interests.

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Aerobic exercise capacity in young rugby players
Capacitatea aerobă de efort la sportivii tineri care practică rugby

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Abstract

Background. The high level of modern rugby requires carefully designed physical training, adapted to the particularities of this sport, in a direct correlation with age and the training level of the players.

Aims. The indicators of aerobic exercise capacity during the training period were studied in young rugby players with specific training and in pupils and students with general sports training.

Methods. The research was performed in 6 groups (n=10 subjects/group): group M I (18 years), group M II (19 years), group M III (20 years) – controls, and group S IV (18 years), group S V (19 years), group S VI (20 years) – athletes. The measured indicators of aerobic exercise capacity were heart rate and indirectly, maximal O_2 consumption, maximal aerobic power, VO_2 max depending on heart rate, VO_2 max depending on age, and aerobic exercise capacity.

Results. Significant decreases of heart rate and significant increases of VO_2 max, aerobic exercise capacity and maximal aerobic power were found in the groups of athletes compared to the groups of non-athletes of the same age.

Conclusions. In the post-pubertal period, in young people with general physical training, an increase of VO_2 max depending on age occurs. Specific sports training determines an improvement of VO_2 max, aerobic exercise capacity and maximal aerobic power in young rugby players.

Key words: VO_2 max, aerobic capacity, physical exercise, rugby players.

Rezumat

Premize. Nivelul înalt la care se practică rugby-ul modern impune o pregătire fizică atent elaborată, adaptată specificității acestui sport, precum și în directă corelație cu vârsta și nivelul de pregătire al sportivilor.

Obiective. S-au studiat indicatorii capacității aerobe de efort în perioada de pregătire la jucătorii de rugby tineri, cu pregătire specifică și la elevi și studenți cu pregătire sportivă generală.

Metode. Cercetările au fost efectuate pe 6 loturi (n=10 subiecți/lot), lotul M I (18 ani), lotul M II (19 ani), lotul M III (20 ani) - martori și lotul S IV (18 ani), lotul S V (19 ani), lotul S VI (20 ani) – sportivi. Indicatorii capacității aerobe de efort determinați au fost frecvența cardiacă și indirect, consumul maxim de O_2, puterea maximă aerobă, VO_2 max în funcție de frecvența cardiacă, VO_2 max în funcție de vârstă și capacitatea aerobă de efort.

Rezultate. Se observă scăderi semnificative ale frecvenței cardiace, creșteri semnificative ale VO_2 max, ale capacității aerobe de efort și ale puterii maxime aerobe la loturile de sportivi, față de loturile de nesportivi de aceeași vârstă.

Concluzii. În perioada postpubertală, la tinerii cu pregătire fizică generală se constată creșterea VO_2 max în funcție de vârstă. Pregătirea sportivă specifică determină îmbunătățirea VO_2 max, a capacității aerobe de efort și a puterii maxime aerobe de efort la jucătorii de rugby tineri.

Cuvinte cheie: VO_2 max, capacitate aerobă, efort fizic, jucători de rugby.

Introduction

Rugby is a team sport involving fight, full commitment and direct contact with the opponent. Having a rich motor content, it belongs to the category of mixed sport games, which are played with both hand and foot. An essential feature of current rugby is full physical commitment; the game has a strong characteristic of contact fight conducted based on individual and collective confrontation during attack and defense, physical training being crucial. Tough fight without sparing the opponent is continued until exhaustion of the opponents' physical resources.

According to Drăgan (2002), from an energogenetic point of view, rugby is part of mixed sports, in which the anaerobic element, both alactacid and lactacid, is predominant. Effort alternates with static and dynamic phases.

This sport is included in the category of intermittent sprint sports due to the specificity and rapid succession of the game phases, which comprise easy running, sprinting, full contact fight with the direct opponent, scrummage, etc.

The game moments characteristic of the rugby game, during which the players attempt to move forward with the

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ball, meeting the direct opponent's resistance, as well as fast running or sprinting phases are high intensity actions. The energy required for this type of effort is provided by anaerobic pathways, while for low intensity game phases, energy is supplied by aerobic pathways.

Aerobic exercise capacity is particularly important in rugby because it can ensure the energy needed for movement on the ground, as well as restoration of phosphocreatine reserves during low intensity game phases.

Some studies have demonstrated that players with a higher aerobic exercise capacity can better cope with high intensity efforts during the game due to the influence of aerobic capacity on recovery after maximal anaerobic exercise and support of the anaerobic glycolytic system (Tomlin et al., 2001).

Hypothesis

Physical training specific to the game might contribute to improving aerobic exercise capacity.

Material and methods

Research protocol

The research took place at the Ambulatory Sports Medicine Clinic and was approved by its manager, by the Ethics Board of the "Iuliu Hatieganu" University of Medicine and Pharmacy Cluj-Napoca, and the informed consent of the subjects was obtained.

a) Period and place of the research

The determinations were performed in April 2013.

b) Subjects and groups

Determinations were performed in 6 groups (n=10 subjects/group):

- 3 control groups: M I (18 years), M II (19 years), M III (20 years), with general physical training (one hour of physical education/week)
- 3 groups of athletes: S IV (18 years), S V (19 years), S VI (20 years), with specific physical training (2 hours/day for 5 days weekly)

The groups of athletes included members of the rugby teams of the "Cluj-Napoca University" club, and the control groups were formed by pupils of the "Avram Iancu" Theoretical High School and students of the "Babes Bolyai" University in Cluj-Napoca. The measurements were carried out in the Ambulatory Sports Medicine Clinic in Cluj-Napoca, under medical supervision.

c) Tests applied

Aerobic exercise capacity (AEC) was explored indirectly using the Åstrand-Ryhming method (Drăgan, 2002); submaximal exercise for 6 minutes, performed on the Ergoline 900 cycle ergometer, at 40-80 rotations/min, with an intensity of 2.5 W/kg maintained constant throughout the test.

The indicators of aerobic exercise capacity were determined:

Directly: - heart rate in cycles/min (HR), measured immediately after exercise using the Polar F2 heart rate monitor.

Indirectly:

- maximal O_2 consumption in ml (VO_2 max), determined using the Åstrand-Ryhming nomogram, based on the linear relationship between heart rate, O_2 consumption and wattage;
- maximal aerobic power (MAP) in ml/kg, calculated based on the formula: MAP=VO_2 max/G;
- ideal VO_2 max, calculated based on the formula: ideal VO_2 max =104.4-(0.38 X G);
- aerobic exercise capacity, expressed as percentage, in relation to ideal VO_2 max: AEC=MAP/ ideal VO_2 max.

d) Statistical processing

Statistical processing was performed using the StatsDirect v.2.7.2 program, with the OpenEpi 3.03 application and the Excel application (Microsoft Office 2010). The results were graphically represented using Excel (Microsoft Office 2010).

Results

Comparative analysis

In the groups of athletes S_{18}, S_{19}, S_{20}, compared to the control groups M_{18}, M_{19}, M_{20}, the following were found:

- Significant decreases of heart rate (Tables I, IV)
- Significant increases of VO_2 max (Table II) and VO_2 max/HR (Table III)
- Significant increases of AEC (Table V) and MAP (Table VI)

Depending on age, in the groups of athletes, the following were found:

- Significant increases of heart rate in group S_{19} compared to S_{10} (Table IV)
- Significant increases of MAP in group S_{18} compared to S_{19} (Table V)
- Decreases of VO_2 max depending on age in S_{19} compared to S_{18}, in S_{20} compared to S_{19} (Table IV)
- Significant decreases of AEC in S_{19} compared to S_{18} (Table VI)

In the control groups - M_{18}, M_{19}, M_{20} – depending on age, the following were found:

- Increases of VO_2 max depending on age in M_{19} compared to M_{18}, in M_{20} compared to M_{18} and M_{19} (Table IV).

The correlation analysis between the studied indicators in the groups of athletes (Table VII) showed for:

a) Group S_{18}: - a very good negative correlation for HR-MAP and HR-AEC;

- a very good positive correlation for VO_2 max-VO_2 max/HR
- a good positive correlation for VO_2-AEC
- a very good positive correlation for MAP-AEC

b) Group S_{19}: - a good negative correlation for HR-VO_2 max

- a very good negative correlation for HR-VO_2 max/HR and HR-AEC
- a good positive correlation for VO_2 max-MAP
- a very good positive correlation for VO_2 max-VO_2 max/HR and

VO_2 max-AEC

c) Group S_{20}: - a good negative correlation for HR-VO_2 max

- a very good negative correlation for HR-MAP, HR-VO_2 max/HR, HR-AEC
- a very good positive correlation for VO_2 max-MAP
- a very good positive correlation for VO_2 max-VO_2 max/HR, VO_2 max-AEC
- a very good positive correlation for MAP-VO_2 max and MAP-AEC.

The correlation analysis between the studied indicators

Table I
Comparative analysis of heart rate values (measured in cycles/min) in the studied groups and statistical significance.

Group	Mean	SE	Median	SD	Minimum	Maximum	*Statistical significance (p)*
M18	169.8	4.0050	171	12.6649	150	192	M + S
M19	169.2	2.4980	168	7.899	156	180	< 0.001
M20	163.8	2.8355	162	8.967	150	180	
S18	137.4	4.1425	132	13.0996	120	168	M18-M19-M20
S19	146.4	3.3705	144	10.6583	132	162	NS
S20	142.8	4.3635	144	13.7986	120	168	
p	M18-S18	< 0.001	M18-M19	NS	S18-S19	< 0.05	S18-S19-S20
	M19-S19	< 0.001	M18-M20	NS	S18-S20	NS	NS

Table II
Comparative analysis of VO_2 max (measured in ml/min) in the studied groups and statistical significance.

Group	Mean	SE	Median	SD	Minimum	Maximum	*Statistical significance (p)*
M18	2815	144.1546	2750	455.8569	2350	3600	M + S
M19	3030	125.4326	3100	396.6527	2450	3800	< 0.001
M20	2965	183.7949	2775	581.2104	2350	4100	
S18	5180	183.6664	5300	580.8040	4400	6100	M18-M19-M20
S19	4580	309.1386	4300	977.5821	3350	6100	NS
S20	5160	345.1892	5350	1091.5840	3800	6800	
p	M18-S18	< 0.001	M18-M19	NS	S18-S19	NS	S18-S19-S20
	M19-S19	< 0.001	M18-M20	NS	S18-S20	NS	NS
	M20-S20	< 0.001	M19-M20	NS	S19-S20	NS	

Table III
Comparative analysis of VO_2 max/HR values in the studied groups and statistical significance.

Group	Mean	SE	Median	SD	Minimum	Maximum	*Statistical significance (p)*
M18	16.74	1.0855	16.35	3.4327	12.24	22.22	M + S
M19	17.99	0.9212	17.54	2.9131	14.08	24.36	< 0.001
M20	18.23	1.2936	17.03	4.0907	14.08	25.31	
S18	38.03	1.7481	39.57	5.5278	26.19	45.45	M18-M19-M20
S19	31.71	2.6663	29.17	8.4315	21.47	44.20	NS
S20	36.84	3.1826	37.23	10.0642	23.21	49.28	
p	M18-S18	NS	M18-M19	NS	S18-S19	< 0.001	S18-S19-S20
	M19-S19	NS	M18-M20	NS	S18-S20	< 0.001	NS
	M20-S20	NS	M19-M20	NS	S19-S20	< 0.001	

Table IV
Comparative analysis of VO_2 max values depending on age in the studied groups and statistical significance.

Group	Mean	SE	Median	SD	Minimum	Maximum	*Statistical significance (p)*
M18	47.79	0.0276	47.78	0.0872	47.69	47.97	M + S
M19	47.42	0.0264	47.43	0.0835	47.26	47.56	< 0.001
M20	47.03	0.0270	47.03	0.0854	46.90	47.15	
S18	47.79	0.0357	47.80	0.1128	47.64	47.996	M18-M19-M20
S19	47.46	0.0377	47.47	0.1191	47.27	47.63	< 0.001
S20	47.05	0.0305	47.06	0.0964	46.89	47.17	
p	M18-S18	NS	M18-M19	< 0.001	S18-S19	< 0.001	S18-S19-S20
	M19-S19	NS	M18-M20	< 0.001	S18-S20	< 0.001	< 0.001
	M20-S20	NS	M19-M20	< 0.001	S19-S20	< 0.001	

Table V
Comparative analysis of MAP values (measured in ml/kg) in the studied groups and statistical significance.

Group	Mean	SE	Median	SD	Minimum	Maximum	*Statistical significance (p)*
M18	46.002	1.6404	47.058	5.1873	36.905	52.459	M + S
M19	43.105	0.9593	41.908	3.0337	40	50	< 0.001
M20	44.913	1.6281	45.973	5.1486	38.406	53.333	
S18	64.118	3.0050	66.681	9.5027	45.833	77.419	M18-M19-M20
S19	55.035	2.6226	55.929	8.2935	44.086	67.647	NS
S20	57.690	3.0033	55.155	9.4972	41.489	75.342	
p	M18-S18	< 0.001	M18-M19	NS	S18-S19	< 0.05	S18-S19-S20
	M19-S19	< 0.001	M18-M20	NS	S18-S20	NS	NS
	M20-S20	< 0.01	M19-M20	NS	S19-S20	NS	

Table VI
Comparative analysis of AEC values (%) in the studied groups and statistical significance.

Group	Mean	SE	Median	SD	Minimum	Maximum	*Statistical significance (p)*
M18	0.569	0.0170	0.568	0.0538	0.472	0.646	M + S
M19	0.555	0.0151	0.549	0.0479	0.502	0.662	< 0.001
M20	0.567	0.0230	0.560	0.0726	0.481	0.661	
S18	0.874	0.0286	0.894	0.0903	0.675	0.967	M18-M19-M20
S19	0.759	0.0401	0.737	0.1267	0.593	0.927	NS
S20	0.823	0.0450	0.817	0.1423	0.604	0.991	
p	M18-S18	< 0.001	M18-M19	NS	S18-S19	< 0.05	S18-S19-S20
	M19-S19	< 0.001	M18-M20	NS	S18-S20	NS	NS

Table VII
Statistical analysis of correlation between the values of the studied indicators.

Indicator	\ Group	M18		S18		M19		S19		M20		S20	
Age	HR	-0.2655	**	0.0389	*	-0.2837	**	0.2103	*	0.2625	**	-0.3451	**
	VO_2 max	-0.0144	*	0.1197	*	0.0621	*	-0.0036	*	0.2219	*	0.7175	***
	MAP	-0.3493	**	0.1036	*	-0.0545	*	-0.2432	*	-0.1083	*	0.2976	**
	VO_2 max acc. to age	-1.0000	****	-1.0000	****	-1.0000	****	-1.0000	****	-1.0000	****	-1.0000	****
	VO_2 max/HR	0.0585	*	0.1525	*	0.1208	*	-0.0573	*	0.0545	*	0.6265	***
	AEC	-0.3138	**	0.1325	*	0.0845	*	-0.1290	*	0.0379	*	0.5668	***
HR -	VO_2 max	-0.4382	**	0.0593	*	-0.4170	**	-0.6507	***	-0.4663	**	-0.6188	***
	MAP	-0.3618	**	-0.9342	****	-0.4645	**	-0.9715	****	-0.9515	****	-0.9604	****
	VO_2 max acc. to age	0.2655	**	-0.0389	*	0.2837	**	-0.2103	*	-0.2625	**	0.3451	**
	VO_2 max/HR	-0.7032	***	-0.3329	**	-0.6534	***	-0.7786	****	-0.5742	***	-0.8102	****
	AEC	-0.5030	***	-0.8044	****	-0.5968	***	-0.8653	****	-0.8116	****	-0.8427	****
VO2 max -	MAP	0.0690	*	0.1511	*	0.7646	****	0.7305	***	0.6183	***	0.6765	***
	VO_2 max acc. to age	0.0144	*	-0.1197	*	-0.0621	*	0.0036	*	-0.2219	*	-0.7175	***
	VO_2 max/HR	0.9441	****	0.8434	****	0.9598	****	0.9828	****	0.9666	****	0.9573	****
	AEC	0.5532	***	0.5739	***	0.9463	****	0.9355	****	0.8803	****	0.9303	****
MAP -	VO_2 max acc. to age	0.3493	**	-0.1036	*	0.0545	*	0.2432	*	0.1083	*	-0.2976	**
	VO_2 max/HR	0.2213	*	0.6429	***	0.8013	****	0.8378	****	0.6848	***	0.8484	****
	AEC	0.8687	****	0.8956	****	0.9030	****	0.9245	****	0.9168	****	0.8989	****
VO_2 max HR V. -	VO_2 max/HR	-0.0585	*	-0.1525	*	-0.1208	*	0.0573	*	-0.0545	*	-0.6265	***
	AEC	0.3138	**	-0.1325	*	-0.0845	*	0.1290	*	-0.0379	*	-0.5668	***
VO_2 max/HR -	AEC	0.6467	***	0.9122	****	0.9763	****	0.9816	****	0.8667	****	0.9892	****

Correlations: **** very good, *** good, ** acceptable, * weak

in the control groups (Table VII) showed for:

a) Group M_{18}: - a good negative correlation for HR-AEC

- a very good positive correlation for VO_2 max-VO_2 max/HR
- a good positive correlation for VO_2 max-AEC
- a very good positive correlation for MAP-AEC

b) Group M_{19}: - a good negative correlation for HR-AEC

- a very good positive correlation for VO_2 max-MAP, VO_2 max-AEC and MAP-AEC

c) Group M_{20}: - a good negative correlation for HR-AEC

- a very good positive correlation for VO_2 max-MAP, VO_2 max-AEC and MAP-AEC

Discussions

Many authors have studied in young rugby players (aged 11-22 years) the factors that influence their activity profile:

- age (Galvin et al., 2013; Waldron et al., 2014; Kobal et al., 2016; Darrall-Jones et al., 2015; Till et al., 2014)
- individual physiological characteristics, physical abilities and longitudinal evolution (Till et al., 2014; Barr et al., 2014; Waldron et al., 2014; Hausler et al., 2016)
- maturation (Gabbett et al., 2008)
- the position in the game (La Monica et al., 2016; Swaby et al., 2016)
- aerobic exercise capacity (Gabbett et al., 2008; La Monica et al., 2016; Sampson et al., 2015; Woldron et al., 2014)
- training - type of training, type of movements, duration and frequency of movements (continuous or repeated) (Sampson et al., 2015; Waldron et al., 2014; Twist & Highton, 2013; Robineau et al., 2016)
- intensity and frequent collisions (Johnston et al., 2014; Mullen et al., 2015; Gabbett et al., 2013; Hausler et al., 2016)
- fatigue (Gabbett, 2008; Johnston et al., 2014)
- biochemical changes post-training (Johnston et al., 2014; Mullen et al., 2015; Galvin et al., 2013)

Our results are in accordance with the data of other authors regarding the increase of VO_2 max, AEC and MAP in junior rugby players as a result of specific training (Gabbett, 2008; La Monica et al., 2016; Twist & Highton, 2013; Kobal et al., 2016; Swaby et al., 2016).

In the studied groups, whose standard anthropometric indices were presented in the article published in no. 1/2016, the body mass index (BMI) evidenced:

- a good positive correlation with VO_2 max in all subjects of the control groups - M_{18}, M_{19}, M_{20}
- a very good positive correlation with VO_2 in group S_{19}
- a good positive correlation with VO_2 in group S_{20}
- a good positive correlation with AEC in group S_{19}

Conclusions

1. In the post-pubertal period, in young people with general physical training, an increase of VO_2 max depending on age occurs.
2. Specific physical training of young rugby players during the post-pubertal period causes an improvement of VO_2 max, AEC and MAP.
3. The improvement of exercise capacity indicators can be considered as an adaptive change induced by specific physical training in young rugby players.
4. Adaptive changes of exercise capacity indicators in young rugby players should be taken into account for tertiary selection with a view to training elite players.

Conflicts of interest
Nothing to declare.

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Composition and structure of the menu for top level young athletes involved in Handball

Compoziţia şi alcătuirea meniului pentru tinerii jucători de handbal

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Abstract

Background. Menu planning is an important element of sports performance in order to enhance an athlete's recovery process during daily training.

Aims. Establishing a relationship between food consumption, body weight and specific activity of athletes in the sport practiced.

Methods. A transversal epidemiological study was conducted during January-February 2015 in order to identify food consumption in a group of athletes. Thereby, 57 female athletes, with a mean age of 14.4±1.78 years, with specific handball practice, were included in the study. The data was obtained by applying a 17-item questionnaire.

Results. A statistically significant association (p=0.0002) between decreased levels of nutrition practice (3.35±0.84) and age (r=-0.471, 95% CI =-0.653 to -0.237) was obtained. The female athletes described the intensity of the effort carried out over a week, as a physical perception, high values on days 2, 5 and 6 during the training week, representing Tuesdays (2.46±0.76), Fridays (2.07±1.34), and Saturdays (2.08±1.31) being identified. At the same time, total exercise length (300±20 minutes/week) was directly proportional to the perception of effort, the effort perception index increasing with the increase of the total length of training.

Conclusions. The identified results influence the effort in energy terms, through strength, total activity time and intensity. If these parameters are not found on an average level during the effort, the typical sports practice will be adversely affected, relating directly to energy deficiencies. Establishing a comprehensive program of nutritional education for athletes and parents, through suggestions in various important periods during the season, is still a basic objective.

Key words: breakfast, intensity, carbohydrate, meal, handball.

Rezumat

Premize. Planificarea meniului reprezintă un element important al activității sportive de performanță în îmbunătățirea procesului de recuperare a sportivilor.

Obiective. Relaționarea consumului alimentar, a greutății corporale a sportivilor și activitatea specifică din cadrul sportului practicat.

Metode. A fost inițiat un studiu transversal epidemiologic, spre identificarea consumului alimentar în cadrul unui grup de 57 de sportive, cu practică specifică în handbal, prin aplicarea unui chestionar de 17 întrebări. Studiul a fost desfășurat în perioada ianuarie-februarie 2015, în Târgu Mureș, România. 57 sportive, membre ale echipei de handbal, cu vârsta medie 14.4±1.78, au fost incluse în studiu.

Rezultate. S-au obținut asocieri semnificativ statistice (p=0.0002) între scăderea nivelului de practică nutrițională (3.35±0.84), și înaintarea în vârstă (r=-0.471, CI95%=-0.653 to -0.237). Sportivele au descris intensitatea efortului desfășurat pe parcursul unei săptămâni, sub forma percepției fizice asupra efortului, identificându-se valori crescute pe ziua a 2-a, respectiv ziua a 5-a, și a 6-a de pregătire din cadrul săptămânii, reprezentând zilele de marți (2.46±0.76), vineri (2.07±1.34), și sâmbătă (2.08±1.31). Totodată, durata efortului (300±20 minute/săptămână) a fost direct proporțională cu percepția efortului, raportându-se creșterea indicelui de percepție al efortului, prin creșterea duratei totale de acțiune.

Concluzii. Rezultatele identificate influențează efortul, din punct de vedere energetic, prin rezistență, durată și intensitate de lucru. Dacă acești parametri nu se regăsesc la un nivel mediu pe parcursul efortului, practica sportivă tipică va fi afectată negativ, date care se concretizează și pe baza deficiențelor energetice. Stabilirea unui program complex de alimentare, educarea sportivilor, cât și a părinților, prin sugestii și preparate optime în diferite perioade importante ale sezonului competițional, reprezintă un obiectiv de bază în continuare.

Cuvinte cheie: mic dejun, intensitate, carbohidraţi, masă principală, handbal.

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Introduction

Food preferences and the objective of energy distribution during the day can influence sports activities through the implemented menu structure (Grandjean, 1997). Creating a menu will take into account daily activity periodization, such that the structure of food consumption and implementation will be carried out according to the training performed. The data is complemented through the importance of the energy/nutritional balance during a period in which growth and body development is the most important objective of the young athlete (Garrido et al., 2007).

The main element of influence in sport performance is represented by the athletes' training program, through the periodization that is imposed during the season. Thus, secondary factors involved in energy recovery, such as macronutrients/micronutrients and liquids, will insure the athlete's recovery process, favoring physical development (Millard-Stafford et al., 2005). Providing balanced meals (energy/ nutrients) represents a basic element of sport nutrition. In order to achieve the energy requirements, training information such as duration, intensity, and objective of the activity will be used to change the food quantities and to establish the dominant macronutrient of the meal (Millard-Stafford et al., 2008). Carbohydrates represent the energy form that will be consumed to a greater extent (50-60%) during the day, along with proteins (15-20%) and lipids (15-20%) (Hinton et al., 2004). Such values tend to change depending on the activity performed by the individual. However, a small number of studies have highlighted the menu structure in relation to the work performed by athletes. Moreover, the selected population requires special attention for food variation due to the average age of the study group.

Hypothesis

Correct training periodization combined with an optimal diet adaptation during the physical development period, between 12-15 years of age, will form the basis of high performance in athletes. Improving adaptation, along with technical/tactical development, according to age, can generate a complex of motor skills in achieving optimal basic/specific training during the season.

Material and method

Research protocol

A transversal epidemiological qualitative study was conducted after obtaining the approval of the sports club Ethics Committee and the consent of the subjects (or their legal guardians) for participation in the study, a confidentiality agreement being also required. Throughout this study, we monitored the daily menu structure and its variation based on effort perception.

a) Period and place of the research

This paper was carried out during January-February 2015, in the athletes' training center in Târgu Mureş, Romania.

b) Subjects and groups

A total of 57 female athletes, with a mean age of 14.4±1.78 years, members of the handball team, with specific competitive national and international activities, were included in the study.

c) Tests applied

Data extraction was performed using a 17-item questionnaire with multiple choice answers. The main objective of the survey was to identify the eating habits of the athletes (food consumption and food knowledge), and secondarily, to correlate them with daily training activities. Thus, training activity was characterized through effort perception reported on a scale from 1 to 3, with values between 1 representing minimum effort difficulty, and 3, representing maximum effort difficulty. At the same time, the total number of training days during a week was reported by athletes, along with the total time spent in effort during each workout (number of days/ minutes). In terms of nutritional practice, during data extraction we included aspects of food consumption characterization, such as meals eaten throughout the day, percentage of energy distributed for each of the meals scheduled throughout the day (%), food consumed (g), and moments of ingestion (serving time during the day). The data regarding the athletes' training seasons, including total activity time and effort intensity, were communicated by the athletes, and approved by coaches.

d) Statistical processing

Statistical evaluation was performed using GraphPad Prism 5.0 software. The statistical indicators used were standard deviation (SD), standard error (SE), average value (mean), and coefficient of variation (CV). Pearson correlations were used to determine the association between two indicators; the confidence interval used in data analysis was 95%. The level of significance $p<0.05$ was considered statistically significant, while data exposure was performed through mean value and standard deviation (mean±SD).

Results

The athletes' weight and BMI showed values within normal limits, as well as underweight and overweight values. Thus, the average weight was 56.18±9.68 kg, with a minimum value of 36 kg, and a maximum value of 75 kg. The body mass index (BMI) indicated a minimum value of 15.20, and a maximum value of 25.5, while the average measured data was 20.78±2.19. The mean age of the subjects was 14.4±1.78 years, with range values between 13 and 15 years.

During the first phase, the subjects' nutritional practice was characterized based on a scale from 1 to 5 (1 – low level, 5 - high level). The results showed that 57.1% of athletes reported an average level of nutritional knowledge. Statistically significant associations ($p=0.0002$) were obtained between decreased nutritional practice levels (3.35±0.84) and increasing age ($r=-0.471$, 95% CI=-0.653 to -0.237). However, the body mass index of the athletes (20.78 ± 2.19) was reported to be within normal limits in association with appropriate nutritional practice, while decreased nutritional practice levels were significantly associated ($p=0.03$) with an inappropriate weight gain in relation to age and height ($r=-0.286$, 95% CI=-0.51 to -0.024).

Correct daily food intake distribution estimated by the subjects indicated that 17.9% of the group distributed the

correct proportion of energy consumption (during the day - %) for breakfast (value considered normal: 30%), while 32% had a correct proportion, in quantitative terms, during the first snack of the day. However, lunch was consumed in the right quantitative proportion by 21.4% (value considered normal: 40%), the second snack of the day was properly consumed by 7.1% (value considered normal: 10%) and dinner by 32.1% (value considered normal: 20%) (Fig. 1). Individual data evidenced statistically significant correlations between the percentage of energy distributed during the first meal of the day (21.38±13.30%) and nutritional practice reported by the subjects (3.35±0.84), showing an increase in the percentage of energy distributed for breakfast (21.38±13.30%) in association with increased nutritional practice characterization. However, the increasing age of athletes (14.4±1.78 years) was correlated with an improvement of energy intake during breakfast, but without statistical significance (p=0.0537).

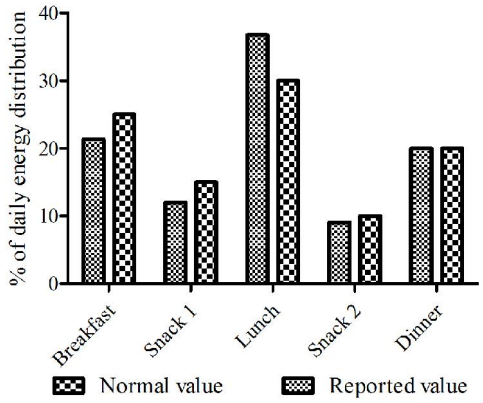

Fig. 1 – Data regarding the distributed energy value and the ideal value in the study group.

Furthermore, food consumption justified through these data indicates differences in the daily energy intake based on physical progress and intensity of the effort. As a result, female athletes described the intensity of the effort carried out over a week, as physical perception; high values on days 2, 5 and 6 of the training week, i.e., Tuesday (2.46±0.76), Friday (2.07±1.34), and Saturday (2.08±1.31), were identified. At the same time, total exercise duration (300±20 minutes/week) was directly proportional to the perception of the effort, indicating a growth of the effort perception index by an increase in the total duration of training. Despite these results, the coach did not report any changes in the volume or intensity of the effort during the training period.

In association with effort, daily food consumption indicated differences in terms of quantity/quality. Four distinct days, during which athletes reported an increased level of effort, suggested changes in food consumption (Table I).

As a consequence of food intake changes as a result of the effort, we identified an energy restriction and/or modification of the dominant macronutrient, represented by complex carbohydrates, at the expense of inadequate food choices in terms of nutrition (intake of simple carbohydrates or foods with a high amount of fat) (Table II).

These data show that different structures for daily food consumption may influence the quality/quantity of the food, which can indicate the athletes' inability to achieve their nutritional goal (Table III).

Table III

Summary of the dietary intake in the study group

Food	Daily (%)	2-3 servings per day (%)	1 serving per day (%)	Rarely (%)	Never (%)
Milk	33.9	35.7	14.3	12.5	3.6
Yogurt	30.4	33.9	12.5	10.7	12.5
Sour cream	3.6	33.9	23.2	35.7	1.8
Kefir	0.0	8.9	7.1	41.1	42.9
Cheese	10.7	35.7	8.9	42.9	1.8
Cottage cheese	3.6	17.9	12.5	42.9	23.2
Butter	44.6	17.9	10.7	19.6	7.1
Melted cheese	16.1	28.6	12.5	39.3	3.6
Beef meat	0.0	10.7	19.6	51.8	17.9
Pork	0.0	17.9	28.6	51.8	17.9
Chicken meat	12.5	55.4	23.2	7.1	1.8
Fish	0.0	10.7	14.3	55.4	19.6
Cold cuts	51.8	35.7	5.4	7.1	0.0
Bacon	0.0	5.4	10.7	46.4	37.5
Sausage	0.0	12.5	26.8	50	10.7
Pate	0.0	12.5	26.8	50.0	10.7
Eggs	1.8	32.1	48.2	17.9	0.0
White bread	67.9	10.7	3.6	14.3	3.6
Wholemeal bread	17.9	17.9	7.1	41.1	16.1
Pasta	0.0	14.3	37.5	44.6	3.6
Confectionery, baked products	7.1	55.4	25	12.5	0.0
Rice	0.0	14.3	33.9	44.6	7.1
Walnuts	1.8	12.5	12.5	62.5	10.7
Sunflower seeds	0.0	10.7	21.4	60.7	7.1
Flaxseed	1.8	7.1	1.8	19.6	69.6
Pistachio	1.8	5.4	16.1	58.9	17.9
Chocolate	55.4	25.0	14.3	5.4	0.0
Chips	1.8	19.6	33.9	42.9	1.8
Crackers	7.1	16.1	35.7	41.1	0.0
Popcorn	1.8	10.7	35.7	51.8	0.0
Sunflower oil	3.6	30.4	19.6	33.9	12.5
Olive oil	3.6	17.9	19.6	37.5	21.4
Palm oil	1.8	1.8	3.6	19.6	73.2
Margarine	7.1	25.0	5.4	23.2	39.3
Natural fruit and vegetable juices	19.6	30.4	25.0	21.4	3.6
Sodas	5.4	17.9	28.6	42.9	5.4
Coffee	0.0	0.0	1.8	16.1	82.1
Apples, pears, bananas	62.5	35.7	1.8	0.0	0.0
Citrus	50.0	32.1	1.8	0.0	0.0
Pineapple, kiwi	8.9	23.2	30.4	35.7	1.8
Grapes	5.4	17.9	25	50	1.8
Peaches, apricots, nectarines	10.7	21.4	21.4	44.6	1.8

Statistically significant associations were obtained between the effort performed and increased snack servings and decreased intake during the last meal of the day (dinner), respectively. At the same time, significant values were obtained between physical activity and decreasing the ratio of calories consumed during breakfast, while simultaneously increasing the energy value of the first snacks served during the day (Table IV).

The level of nutritional knowledge of the subjects was not influenced by exercise length (p=0.486, r=-0.094, 95% CI=-0.349 to 0.172), but sports practice was a significant factor influencing the improvement in nutritional knowledge (p=0.022, r=0.304, 95% CI=0.045 to 0.525).

Table I
Differences between effort perception and food consumption

Days of the week	Effort perception (index 1 to 3)	Snack consumption rate (%)	p	r	95% confidence interval	
					Lower	Upper
I	1.69±1.26	93.3	0.7332	0.04657	-0.2191	0.3058
II	2.46±0.76	58.5	*0.0011	0.4253	0.1828	0.6190
III	1.87±1.38	85	0.9786	0.003661	-0.2596	0.2664
IV	1.66±1.44	31.7	*0.0032	0.0315	0.0291	0.0362
V	2.07±1.34	51.2	*0.040	0.0395	0.0364	0.0432
VI	2.08±1.31	45	*0.0042	0.2120	0.2074	0.5398

Table II
Statistical significance regarding nutritional intake

Parameter 1	Parameter 2	P	r	95% confidence interval		Median
				Lower	Upper	
Age	Nutritional practice	0.0002	-0.4709	-0.6530	-0.2374	13 3
BMI		0.0329	-0.2856	-0.5102	-0.02443	20.75 3
Energy distribution during breakfast		0.0216	-0.3065	-0.5270	-0.04737	20 3
	Age	0.0537	0.2592	-0.004018	0.4889	20 13
Effort perception	Weekly exercise duration	0.0001	-0.2698	-0.2365	-0.4612	3 300

Table IV
Menu structure in direct relation to the perception of effort

Meals served	Frequency				Caloric/energy value (%)			
	p	R	95% confidence interval		p	r	95% confidence interval	
			Min	Max			Min	Max
Breakfast	0.466	-0.099	-0.353	0.168	0.018	-0.314	-0.533	-0.056
Snack 1	0.048	0.264	0.001	0.493	0.0009	0.430	0.188	0.622
Lunch	0.665	0.665	-0.207	0.317	0.472	-0.097	-0.351	0.169
Snack 2	0.427	0.108	-0.159	0.360	0.701	0.052	-0.213	0.311
Dinner	0.039	-0.275	-0.502	-0.013	0.574	0.076	-0.190	0.333

Discussions

Distribution of macronutrients through macronutrient balance is highlighted in many papers (Erdman et al., 2013; Burke et al., 2006). Thus, the distribution of the total energy value in the three main meals of the day is now a suggestive factor in order to characterize the nutritional practice of athletes. Various papers have highlighted the lack of breakfast consumption in young athletes (Cheong et al., 2003; Weimann, 2014). The lack of breakfast along with physical effort may result in the athlete's failure to achieve daily energy requirements as a result of overnight fast (10±2 hours) (Ormsbee et al., 2014). Thus, the body will get a deficiency of glycogen in the liver, with a degradation of about 80% of glycogen deposits (Rothman et al., 1991). The implication of the subject in breakfast serving will continue to influence the work that will take place during the day. An association of such behavior with an unbalanced body mass is commonly seen (Jakubowicz et al., 2013). Lunch, as well as dinner, is most often modified according to the training schedule of the athlete. Overall recovery time plays an important role in establishing dietary intake (Beelen et al., 2010). Various studies report the effect of simple carbohydrates post-exercise, due to increased GI and glycemic variation during the athletes' recovery phase (Wong et al., 2009). However, the consumption of whey and casein protein products is mentioned in the post-exercise period (Wilborn et al., 2013).

Macronutrient distribution of the total energy value throughout the day will take into account the period of the athlete's calendar. However, the overall recovery time will dictate the final form of the nutrition program. Thus, it is possible to identify differences in the structure of food intake during recovery if the total time is more than 8 hours or less than 8 hours (Burke et al., 2006). If the overall recovery time exceeds 8 hours, post-exercise intervention (main period) may be deferred, provided that the first main meal is served within maximum 60 minutes after exercise. If the recovery time falls below 8 hours post-exercise, food consumption (main period) is required. Post-exercise consumption is achieved by rapid and simple carbohydrates due to energy absorption in a catabolic period, characterized by body substrate degradation. Protein extracts, post-exercise, are used due to the plastic effect that will manifest in the body. The literature reports the effect of carbohydrates in combination with proteins after completion of exercise (Koopman et al., 2005). Moreover, in metabolic terms, protein absorption post-

exercise will be improved by ensuring a minimum amount of carbohydrates.

From a practical standpoint, changes in food consumption over a week are induced either through an increase in quantitative terms on the last day of training in the week, or by a decrease in food consumption, or a distribution of the snacks during the period in which athletes may report fatigue associated with loss of appetite – which is dictated by the exercise performed and the lack of recovery in the study group. The athletes' practice is often characterized by a high amount of protein during the main meals. This is complemented by additional consumption of sport products, ensuring a maximum quantity that will be exceeded in g/kg (Hoffman et al., 2004). Thus, the possibility that athletes will focus on the main energy source of the body, carbohydrates, complemented by protein, for body recovery by increasing the synthesis of muscle protein and improving adaptation to exercise, along with lipid intake, for meeting the final energy needs, is a certainty at this time in order to enhance the sport nutrition aspect in young athletes (Purcell et al., 2013; Meyer et al., 2007; Jeukendrup et al., 2011; Smith et al., 2015).

Conclusions

1. The main physical activity along with inadequate food intake during the main meals can suggest a number of changes in the athletes' daily nutrition.

2. The subjects included in this study showed a lack of appropriate nutrition practice during the main meals of the day.

3. As a result, the athletes reported a severe fatigue state as they advanced in weekly training, although the training form was linear during the mentioned period.

4. Establishing a comprehensive food education program for athletes and parents, through suggestions in various important periods during the season, represents a basic objective.

5. At the same time, improving nutritional knowledge will be important in a direct connection with nutritional practice, as shown in the study.

Conflicts of interest

There are no conflicts of interest concerning the results or methodology of the study.

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Correct nutrition structure can influence the main biochemical indicators of metabolic imbalance in athletes

Compoziția alimentară rațională poate influența principalii indicatori biochimici ai dezechilibrului metabolic la sportivi

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Abstract

Background. Proper sports training periodization and correct imposition of energy recovery methods will ensure the efficiency of the athletes' activity.

Aims. Adapting food intake, based on the determined energy costs of individual athletes can help the implementation of a diet that will mantain metabolic balance.

Methods. A clinical study was conducted on a group of 12 elite rowers in the beginning of the general training period, during November-December 2015. The study provided biochemical monitoring in two distinct periods (P1, P2), characterized by different quantitative/qualitative diets. The entire study was conducted over 20 days in which the effort performed during the training seasons was linear. Among the mentioned periods (P1, P2) we studied the following biochemical parameters: pH, HCO_3, pCO_2, pO_2, BE, SBE, SBC, Ca^{++}, Mg^{++}, LDH, GPT, T-Pro, Alb.

Results. We obtained statistically significant data between the two periods (P1, P2), concerning the pre-intervention BE value (0.17±0.83) and the post-intervention BE (2.16±1.44) value. Also, the pre-intervention GPT value (46.67±24.63) was different from the post-intervention GPT value (24.08±5.29); statistically significant values were also found regarding Hb, pH, GPT, LDH, T-Pro, Alb, Ca, Mg pre-intervention and post-intervention.

Conclusions. Individualization of diet will represent a benefit regarding parameters that reflect the stage of body recovery after the training season. These include HCO_3, pH, GPT, along with Ca and Mg, whose serum values may be increased in the presence of elevated values of pCO_2, HCO_3, and BE, indicating impaired respiratory recovery, and also decreased activity efficiency.

Key words: recovery, metabolism, exercise, respiratory, rowers.

Rezumat

Premize. Periodizarea corectă a antrenamentului sportiv şi impunerea unor mijloace de recuperare energetică corecte vor asigura eficiența activității prestate.

Obiective. Identificarea structurii alimentare, care, alături de periodizarea efortului, va milita spre reducerea costurilor totale metabolice ale sportivilor angrenați într-un program de pregătire de minim 5 ore/ zi.

Metode. A fost desfășurat un studiu clinic, pe un grup elită de canotori (12 sportivi), în debutul perioadei de pregătire generală, pe parcursul lunilor noiembrie-decembrie 2015. Studiul a prevăzut monitorizarea sportivilor din punct de vedere biochimic, în două perioade distincte, caracterizate prin regimuri alimentare cantitativ/calitativ diferite (P1, P2). Întreg studiul a fost desfășurat pe parcursul a 20 zile, în cadrul cărora dozarea efortului sportiv a fost lineară. Între perioadele amintite (P1, P2), s-au studiat următorii parametri biochimici: pH, HCO_3, pCO_2, pO_2, BE, SBE, SBC, Ca^{++}, Mg^{++}, LDH, GPT, T-Pro, Alb.

Rezultate. S-au identificat semnificații statistice între cele două perioade (P1, P2), privind valoarea BE (0,17±0,83) pre-intervenție și valoarea BE (2,16±1,44) post-intervenție. De asemenea, valoarea GPT pre-intervenție (46,67±24,63) a fost diferită față de valoarea GPT post-intervenție (24,08±5,29); valori semnificativ statistic au fost întâlnite, de asemenea, privind valorile Hb, pH, GPT, LDH, T-Pro, Alb, Ca, Mg pre-intervenție și post-intervenție.

Concluzii. Individualizarea rației alimentare, prin atingerea unor valori medii adaptate indivizilor, va semnala un beneficiu privind parametrii care indică stadiul de recuperare al organismului post-efort fizic. Printre aceștia se află HCO_3, pH, GPT, alături de Ca și Mg, ale căror valori serice pot fi crescute în apropierea unor valori pCO_2, HCO_3 și BE crescute, semnalând deficiențe de recuperare respiratorie și totodată scăderea randamentului sportiv.

Cuvinte cheie: recuperare, metabolism, antrenament, respirator, canotori.

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Introduction

Monitoring elite athletes in order to obtain information on how the body reacts during exercise is at the moment a usual practice which is applicable to all activity levels. Moreover, proper training periodization imposed in endurance sports can support changes in the body's physiological status (Bishop & Claudius, 2005). As a result, the increased metabolic costs of the body, to support the activity performed, can create physiological metabolic imbalances.

Theoretically, rowing is an endurance sport, whose physical practice is based on a preponderance of factors such as increased aerobic power, anaerobic power, rowing technique and tactics (Mäestu et al., 2005). However, the performances have a close connection with the athletes' physical capacity, and therefore with the training program. It is known with certainty that physical activity can significantly modify the metabolic balance of the athlete, so collecting data that can reflect the energy metabolism status is of particular importance (Yan et al., 2009).

Nutritional practice seeks to preserve body homeostasis in order to maintain health and increase athletic performance. Therefore, the body tissues and pH level, once modified, must reach the normal value reported in a given period of time (Aerenhouts et al., 2011). Basal metabolism generates organic acids (Remer et al., 1995), while intense effort generates lactic acid accumulation (Robergs et al., 2004). In practical terms, if and when an increased production of lactic acid occurs, free H^+ ions can be buffered by bicarbonate, resulting in non-metabolic carbon dioxide (CO_2) production. As a result, acidosis and elevated CO_2 stimulate an increased ventilatory rate, establishing a temporary relationship between lactate and ventilatory thresholds (Robergs et al., 2004; Kaplan, 2001). This outcome may be suggested by carbohydrate metabolism and myocardial metabolism during specific intense physical effort. Elevated lactate concentrations in the subjects may cause alteration of the glycolysis process (Tang, 2006; Yan et al., 2009).

Hypothesis

Adapting food intake, based on the determined energy costs of individual athletes can help the implementation of a diet that will mantain metabolic balance as a result of the effort performed. Therefore, pH, CPK, T-Pro, Alb, Ca, Mg, GPT, HCO_3 values identified through correct planning of the training periods allow to influence the final metabolic cost of the individual through the complexity of the hygienic-dietary system.

Material and method

Research protocol

A case study was conducted after obtaining the approval of the Ethics Committee, and the subjects' informed consent to participate in the study. We monitored the effect that proper nutrition structure may have on the main biochemical parameters studied during training sessions, over a period of 20 training days.

a) Period and place of the research

The study was conducted during November-December 2015, in the athletes' training center in Bucharest, Romania.

b) Subjects and groups

A total of 12 elite male athletes with a mean age of 21.58±1.5 years, 195.1±4.86 cm height, and 96±8.28 kg weight were included in the study.

c) Test applied

Data extraction occurred in two distinct periods. In November 2015, a nutritional plan was implemented, associated with a total reported value of 3527.24±130 kcal/day. The energetic value was associated with 376.81 g CHO (carbohydrates), 204.69 g P (proteins), 125.51 g L (lipids) during period 1 (P1), representing: 43.73% carbohydrate, 23.8% protein and 32.4% fat. The first biochemical testing occurred 12 days after implementation of the regime described (P1); After obtaining the first biochemical data, the menu was revised. Blood samples were analyzed using the acid-base balance analyzer ABL 835 Radiometer (fixed).

The second period of intervention was initiated using the Cosmed Quark CPET equipment, by determining the metabolic rate at rest (MRR). The protocol took into account monitoring of athletes in the morning based on the following premises: lack of effort (24 h), food intake (5 h), absence of caffeine (12 hours), sports supplements (containing ephedrine, Ma Huang, pseudoephedrine), and nicotine (12 hours) pre-testing. Through the determinations we obtained an average energy expenditure of 4318±298 kcal for the athletes, associated with an amount of 583 g CHO, 135 g L, and 180 g P, which represented 55% carbohydrates, 17% proteins and 28% fats of the whole body energy needs, during the second period (P2). Throughout this period, the form of training was linear, following the aerobic exercise zone for the general period of training, including a total of 16±3.5 kilometers during the training periods, at a mean heart rate value of 145±15 b/min. All data were expressed as mean value±SD (standard deviation). The illustrated data were used as reference: pH (7.35-7.45), HCO_3 (22-26 mEq/liter), pCO_2 (35-45 mmHg), pO_2 (75-100 mmHg), BE (-2/+2 mEq/liter), SBE (-2/+2 mEq/liter), SBC (22-26 mEq/liter), Ca^{++} (8.5-10.2 mg/dl), Mg^{++} (1.9-2.2 mg/dl), LDH (120-333 UI/L), GPT (0-33 UI/L), T-Pro (6.7-8.3 g/dl), Alb (3.8-5.1 g/dl).

d) Statistical processing

Statistical evaluation was performed using GraphPad Prism 5.0 software. The statistical indicators used were: standard deviation (SD), standard error (SE) and coefficient of variation (CV). The level of significance $p<0.05$ was considered statistically significant.

Results

The data of 12 elite athletes were analyzed based on different nutritional structures implemented at group level in each period (P1, P2), during 20 activity days. For the studied group, the average age was 21.58±1.5 years, mean weight was 96±8.28 kg, and height was 195.1±4.86 cm. The studied parameters were directly related to the effort performed and the energy metabolism of the individual. Period 1 (P1) was characterized by a qualitatively/quantitatively different diet from period 2 (P2). Therefore we encountered differences in the quantity/quality of macronutrients required by athletes for the whole body

Table I

Total energy report in terms of macronutrients during period 1 (P1) and period 2 (P2).

Period 1 (P1)				Period 2 (P2)			
CHO (g)	P (g)	L (g)	Kcal	CHO (g)	P (g)	L (g)	Kcal
376.91	204.69	125.51	3527.24	583	180	135	4318

Table II

Statistical significance concerning the monitored biochemical values during P1-P2.

Determined biochemical parameters		Paired Differences					t	Sig. (2-tailed)
Period 1 (P1)	Period 2 (P2)	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference			
					Lower	Upper		
Hb	Hb	-1.71	1.12	0.32	-2.43	-1.00	-5.28	0.00
pH	pH	-0.035	0.018	0.00	-0.04	-0.02	-6.43	0.00
pCO_2	pCO_2	-0.43	3.64	1.05	-2.75	1.88	-0.41	0.68
pO_2	pO_2	3.39	8.92	2.57	-2.27	9.06	1.31	0.21
HCO_3	HCO_3	-2.50	2.47	0.71	-4.08	-0.93	-3.50	0.00
BE	BE	-2.32	1.79	0.51	-3.46	-1.18	-4.48	0.00
SBE	SBE	-2.70	1.75	0.50	-3.82	-1.59	-5.33	0.00
SAT	SAT	0.05	1.10	0.31	-0.65	0.75	0.15	0.87
SBC	SBC	-1.67	1.45	0.42	-2.59	-0.75	-3.98	0.00
LA	LA	0.08	0.71	0.20	-0.37	0.53	0.38	0.70
R	R	0.02	0.04	0.01	-0.00	0.05	1.847	0.09
cLac	cLac	3.16	5.47	1.57	-0.31	6.64	2.00	0.07
T-Pro (g/dl)	T-Pro (g/dl)	-1.05	0.52	0.15	-1.38	-0.71	-6.88	0.00
Alb (g/dl)0 -	Alb (g/dl)	-0.24	0.25	0.07	-0.40	-0.07	-3.25	0.00
Ca (mg/dl)	Ca (mg/dl)	0.85	0.71	0.20	0.40	1.31	4.17	0.00
TG (mg/dl)	TG (mg/dl)	5.66	30.08	8.68	-13.45	24.78	0.65	0.52
UA (mg/dl)	UA (mg/dl)	0.27	1.09	0.31	-0.42	0.97	0.87	0.40
LDH (UI/L)	LDH (UI/L)	96.50	90.07	26.00	39.27	153.73	3.71	0.00
CPK (UI/L)	CPK (UI/L)	450.50	819.97	236.70	-70.48	971.48	1.90	0.08
GPT (UI/L)	GPT (UI/L)	22.58	23.98	6.92	7.34	37.82	3.26	0.00
Mg (mg/dl)	Mg (mg/dl)	0.03	0.13	0.03	-0.04	0.11	0.88	0.39

recovery process, ensuring an optimum adaptation of the body during the sustained effort (Table I).

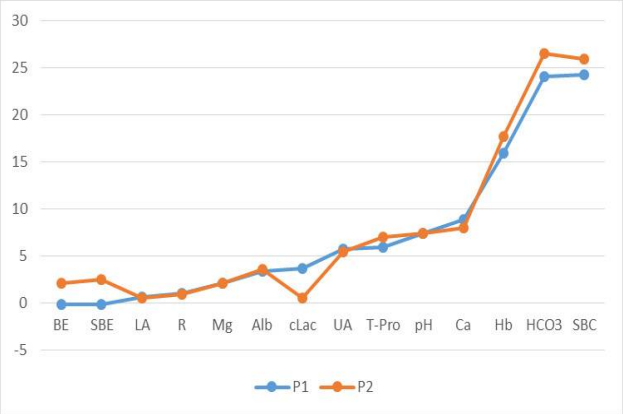
Unlike P2, during P1, a restricted energy intake can be seen, and at the same time, a mismatch of the general ingested macronutrient values, which is confirmed by the differences between the two periods described in the paper. As a result, the difference in the consumption of carbohydrates between the two periods was 233 grams (P2); the difference in the consumption of proteins, 40 grams (P1), and the difference in the consumption of fats, 15 grams (P1). Following these changes, the biochemical tests that confirmed the athletes' activity evidenced significant differences between the two periods of activity (Table 2).

Statistically significant values were found between P1-P2 concerning 11 biochemical parameters. These were the following: Hb, pH, HCO_3, BE, SBE, SBC, T-Pro, White, Ca^{++}, LDH and GPT.

There were marked differences between the two periods P1, P2 (Table II) regarding the Hb value pre-intervention (15.98±1.30) and post-intervention (17.7±1.23). pH, whose value can be adjusted in a short period of time if physiological reductions occur, had a reported value of 7.39±0.01 pre-intervention, showing a significant increase to a value of 7.43±0.01 post-intervention. Bicarbonate (HCO_3) pre-intervention (24.08±0.99 mEq/liter) increased to a statistically significant value post-intervention (26.59±2.06 mEq/liter). Base excess (BE) post-intervention (2.16±1.44 mEq/liter) underwent a major change compared to the pre-intervention period (0.17±0.24 mEq/liter). SBE (standard base excess) pre-intervention (-0.17±0.83 mEq/liter) had significantly altered post-intervention values (2.54±1.4 mEq/liter), along with SBC values (the concentration of standard bicarbonate in the blood) pre-intervention (24.33±0.88 mEq/liter) and post-intervention (26.08±1.14 mEq/liter). The amount of Ca^{++} pre-intervention (8.867±0.62 mg/dl) and Mg^{++} pre-intervention (0.2158±0.17 mg/dl) decreased in P2 (8.00±0.23 mg/dl - Ca; 2.12±0.14 mg/dl - Mg), which suggests a possible pre-intervention change and failure in the recovery process of the respiratory system, slightly modified post-intervention, but still with a slight increase in bicarbonate in P2. Lactate dehydrogenase, an essential enzyme for energy production in the body, had a value of 372.92±92.48 UI/L pre-intervention, and a significant decrease post-intervention (276.42±37.76 UI/L), but still requiring a slight reduction in LDH enzyme, by diet and the training program. Furthermore, blood creatine phosphokinase values (CPK) underwent a series of significant changes showing individual muscle reaction, its efficiency, and response during effort. Thus, pre-intervention CPK levels (622.58±815.31 U/L) underwent major modifications after intervention (172.08±87.13 U/L); the values were statistically insignificant (p=0.083). The same was confirmed for LDH values, and also for the liver load reported pre-intervention (46.67±24.63 UI/L) and post-intervention (24.08±5.29 UI/L). Data are presented in Figures 1 and 2.

Moreover, 65% of the extracted data showed very good homogeneity, while 8% showed good homogeneity, and 27% of the results showed heterogeneity distribution with varying results. The data showing heterogeneity included LA (lactic acid), whose value pre-intervention (0.658±0.05) and post-intervention differed (0.57±0.47).

R value (resting metabolic cost) varied based on nutritional interventions, but the studied group presented heterogeneity values (values up to >35%); as a result, pre-intervention R (1.00±0.02) differed from post-intervention R (0.97±0.039); cLac, with a pre-intervention value of (3.667±5.47) and a post-intervention value of (0.50±0.00), showed heterogeneity of the studied group. Related data were obtained in the case of Mg values.



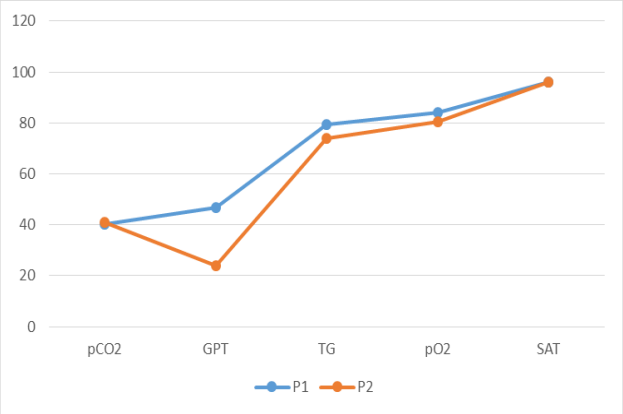


Fig. 1 – Data evolution during period 1 (P1) and period 2 (P2).

Discussions

During this study, by adjusting the nutritional activity of the athletes, we obtained an improvement of biochemical indices, analyzed in association with physical effort. Metabolic costs of the body following the effort will be reflected on biochemical parameters.

As described by many papers, the reported value of CPK in 99% of the cases will be dissociated into lactate anions (La^-) and hydrogen ions (H^+) at a physiological pH value (Schurr, 2006). But both lactic anions and hydrogen ions accumulate in muscle (Gladden, 2004) causing, during effort, due to muscle contractions, a significant increase of the related compounds. With an increasing level of effort, lactic acid becomes a source of energy for the heart muscle, which will be oxidized to CO_2 in the myocardium (Passarella et al., 2008). In the skeletal muscle, energy consumption can be increased; as a result, this action can highlight an increased rate of glycolysis, indicating heavy lactate production (Juel et al., 1999; Petrushova & Mikulyak, 2014). However, lactate is an important source of energy for both myocardial and skeletal muscles. As a result, the compound is used as a respiratory energy source, to meet the final energy costs (Juel et al., 1999; Mazic et al., 2015). In the transition from rest to exercise, increasing concentration of lactic acid can be observed, which is due not to lack of oxygen, but to acceleration of glycolysis, when compared with mitochondrial respiration (Robergs et al., 2004). Yet, after significant accumulation of lactic acid during intense effort, CPK levels will indicate a catabolic status of skeletal muscle. Both exercise intensity and duration are associated with elevated creatine kinase (Passaglia et al., 2013).

Respiratory parameters discussed in this section show a number of significant changes. There is evidence that the pO_2 value will drop due to an increased volume of muscular activity carried out during endurance activities (Loeppky et al., 2008; Lazovic et al., 2015). As a result, the availability of O_2 will be increased at the beginning of the effort, with a decrease in pCO_2, as a result of the compensation made by the development of lactic acidosis (Sun et al., 2001; Durmic et al., 2015). Thus, an increased CO_2 value will impose a decrease in the pH value (Azizi, 2011), whereas metabolically, an increase in the total consumption of carbohydrates and a reduction in fat consumption at rest could be reported. Association of both Ca^{++} and Mg^{++} is important for regulation, energy efficiency and reduction of metabolic costs through optimum functioning of energy, cellular, and respiratory processes (Swaminathan, 2003).

A compound such as Ca^{++} plays an important role in ensuring basic physiological processes, but in conditions of acidosis it may reach high levels, without the association of food consumption (Wiederkehr & Krapf, 2001). Hypercalciuria could be observed due to increased filtered load, and decreased tubular reabsorption, associated with increased serum concentrations (Wiederkehr & Krapf, 2001). The drop in pH value may be suggested by the lowering of total HCO_3 concentration at cellular level (Bergman et al, 1999; Rong et al., 2008). Metabolic costs (R) were increased in P1, unlike P2, being associated with an imbalance of energy metabolism. The association of R-values >1.20 and a low pCO_2 concentration can determine imbalances during recovery of athletes (Ognacsh et al., 2010; Griffin et al., 2003). As a result, low pCO_2, and pH values associated with increased lactic acid suggest muscle inefficiency during the recovery process of athletes (Yan et al., 2009). Associated with the effort performed, the total volume of Hb, whose growth may be related to the VO_2 value, and increased total volume of circulating blood value determined among athletes indicated improvements regarding adaptation during the training periods (Heinicke et al., 2001).

The studied protein values, improved by nutritional intake, are characterized by albumin concentration, whose estimated value reaches a medium level. It must also be remembered that serum albumin in the case of athletes can be low in case of acute inflammation, shock, qualitatively/quantitatively inadequate diet (Fischbach, 2003). Elevated levels may be associated with a dehydrated state. Pathological low values of albumin can be seen during intense periods of impaired protein absorption in the digestive system (Fischbach, 2003). Target populations, represented by athletes, have low albumin values more

often compared to the concentration reported for the population with reduced levels of sport activities (Reamy & Thompson, 2004).

Conclusions

1. Performing the metabolic rate test during rest periods will provide precise data on the energy metabolism of the athlete.

2. Retrieving such data will have an improving effect on nutritional intake, based on the training developed.

3. In practical terms, the adapted energy values will help the recovery process of the athlete after exercise, during the recovery period, which can be verified through the biochemical indices studied.

4. Thus, they can indicate a directly proportional increase of metabolic efficiency, and individual adaptation to exercise.

5. As a result of such determination, we can say that the quality/quantity of nutritional adaptation in the studied group can improve the biochemical parameters analyzed, indicating increased effort adaptation in elite athletes, during correct structured training periodization.

Conflicts of interest

There are no conflicts of interest concerning the results or methodology of the study.

Abbreviations

pH
HCO_3 (bicarbonate)
pCO_2 (partial pressure of carbon dioxide)
pO_2 (partial pressure of oxygen)
BE (base in excess)
SBE (standard base in excess)
SBC (standard bicarbonate)
Ca (calcium)
Mg (magnesium)
LDH (lactate dehydrogenase)
GPT (glutamate pyruvate transaminase)
T-Pro (total protein)
Alb (albumin)
CHO (carbohydrate)
L (lipids)
P (protein)

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Study of nutrition habits and information levels of sportsmen interested in fighting sports

Studiul obiceiurilor nutriţionale şi a nivelului informaţional al sportivilor interesaţi de sporturile combat

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Abstract

Background. Sport field research approaches mainly the relationship between nutrition and sport performance, not taking into consideration the level of the nutrition information of the athletes who practice combat sports.

Aims. The purpose of this study was to determine nutrition habits and information levels of sportsmen interested in fighting sports and analyze the relation between them.

Methods. This research comprises a general screening model. The study was performed in 162 Licensed Sportsmen included in branches of Kickbox, Muai-Thai, Box, Taekwondo under the Van Erciş Youth and Sport Club. With permission from their club, previous scientific studies were evaluated to determine their nutrition habits and information levels and a questionnaire form developed by Göral was used. Statistical estimations were done in the SPSS (version 15.0) program. Frequencies and percentage values of relevant data were estimated, the chi-square test was performed to analyze the relation between the sportsmen's demographic information and nutrition information level.

Results. Looking at the nutrition information points: 67.3% of the sportsmen (n=109) had 4 points and below, 22.8% of them (n=37) registered 5 points. 6 points were registered for 7.4% (n=12), 7 points for 1.9% (n=3) and 8 points for 0.6% (n=1). Nobody registered 0, 1, 9 and 10 points from the questionnaire regarding the nutrition of sportsmen.

Conclusions. According to the data from our study, media is mostly seen as an information resource for suitable and balanced nutrition data and habits, which are important for increasing the sportsmen's performance. Thus, validity and reliability of information are not considered to be enough because of insufficient information means.

Key words: nutrition habits, nutrition information levels, fighting sports, Kickbox, Muai-Thai, Box, Taekwondo.

Rezumat

Premize. Cercetările din domeniul sportiv abordează cu precădere relația dintre nutriție și performanța sportivă, fără a ține cont de nivelul de informare nutrițională a sportivilor din ramurile de combat.

Obiective. Scopul acestui studiu a fost acela de a determina obiceiurile de nutriție și nivelurile de informare ale sportivilor interesați de sporturile de luptă și de a analiza interrelația acestora.

Metode. Această cercetare este o cercetare model general de screening. Studiul a fost realizat pe 162 sportivi licențiați în ramurile kickbox, muai-thai, box, taekwondo sub Van Erciş Youth and Sport Club. Cu permisiunea clubului lor, studiile științifice anterioare au fost evaluate pentru a determina obiceiurile lor nutriționale și nivelurile de informare utilizând un chestionar elaborat de Goral. Estimările statistice au fost efectuate în programul SPSS (versiunea 15.0) Frecvențele și valorile procentuale ale datelor relevante au fost estimate, iar testul chi-pătrat a fost efectuat pentru a analiza relația dintre nivelul de informații nutriționale ale sportivilor și informațiile demografice sportive.

Rezultate. Vizând informațiile nutriționale, punctele rezultate sunt: 67,3% din sportivi (n = 109) au realizat 4 puncte și mai puțin, 22,8% dintre ei (n = 37) au realizat 5 puncte. Au realizat 6 puncte 7,4% (n = 12), 7 puncte 1,9% (n = 3) și 8 puncte 0,6% (n = 1). Niciun sportiv nu a realizat 0, 1, 9 și 10 puncte la chestionarul de evaluare a nivelului de informare nutrițională.

Concluzii. Având în vedere datele din studiul nostru, mass-media este considerată principala resursă de informații pentru a avea date adecvate și echilibrate vizând nutriția și obiceiurile importante pentru creșterea performanțelor sportivilor, prin urmare, validitatea și fiabilitatea informațiilor sunt considerate insuficiente din cauza mijloacelor de informare scăzute.

Cuvinte cheie: obiceiuri nutriționale, niveluri nutriționale informaționale, sporturi de luptă, kickbox, muai-thai, box, taekwondo.

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Introduction

Nutrition and sport are very significant for a healthy life. Regular exercise increases muscle power, flexibility and endurance, provides cardiovascular harmonisation, prevents obesity and possible bone disorders at later ages (Akşit, 1993; Alpar et al.,1986). Among the basic factors affecting the sportsmen's performance, genetic structure, suitable training and nutrition come first (Ersoy & Hasbay, 2000). In obtaining high sports performance, person-based physiological and psychological factors, training, nutrition, health, environmental factors, sport-related characteristics play a role; on the other hand, it is difficult to mention which factor is more effective in maximum performance. However, there is no doubt that expecting high performance from a sportsman who does not eat regularly, which is unhealthy, is impossible (Pehlivan, 2005). Sportsmen spend most of their time training in order to increase their performance. In fact, great efforts are made for training, and good nutrition is extremely important to support these efforts and ensure a high level of efficacy in training (Ersoy, 2011). Nutrition is regarded as a balanced consumption of carbohydrates, lipids, proteins, vitamins, minerals and water, which are essential nutrients to meet the energy needs for vital activities in our body, to protect our health, make physical growth and development possible, adapt to training and maximise the effects of training (Zorba et al., 2000). Fighting sports involve strength, endurance, explosive power, speed and flexibility; furthermore, it is not possible to develop all these characteristics together in many other sport branches. Due to this characteristic, fighting sports are ultimately beneficial for our general health and a fit body. Control of weight is especially important for athletes practicing fighting sports. There may be situations that require them to rapidly lose weight they put on in order to protect their weight from time to time. This is why one must know that any unnecessary weight will slow down speed, that one must certainly focus on muscle-weighted performance if one needs putting on weight; overweight sportsmen must predict their situation months before and have a suitable diet instead of starting to lose weight a few days before matches. However, an important issue that must be considered by sportsmen is that weight loss must be based on fat, not muscle, and performance must be fallen down. Good nutrition is here especially to develop performance, provide coordination, recovery after exercise, and prevent injuries (Aoi et al., 2006; Niess et al., 2007). Intensity and volume of training and competition periods in fighting sports lead some competition sportsmen to use food support products unconsciously as well as to eat well in order to increase their performances. Even though many published studies maintain that appropriate and balanced nutrition is enough for optimal performance, usage of food support products by sportsmen increases rapidly. A major part of these products consists of less known products, on which there are not enough researches and data (Mcclung at al., 2007). Sportsmen use food support products with the expectation of their benefits for sports performance; few of them consider that these products also have negative effects. Potential negative findings involve falls in performance, acute or long-term harms in health, and positive doping results (Maughan et al., 2004). With the increasing interest in sport, nutrition of athletes increasingly becomes a more spoken about and researched topic on agenda. Regular and balanced nutrition is significant for sportsmen in many ways. Many situations such as increasing performance, controlling loss of weight and overweight intake, preventing discomfort given by electrolyte losses in the body, regular functioning of the digestive system, renewing energy sources in the recovery process, which affect sportsmen directly or indirectly, are provided with balanced nutrition (Süel et al., 2006). Researches dealing with persons interested in various sport branches in our country have shown health and nutrition disorders in most of the groups (Martin & Tarcea, 2015; Akil, 2007). In particular, a person who does sport during the growth and development period must take nutrition into consideration for a healthy physical development (Aksoy, 2000). Studies emphasize that trainers and sportsmen need a guiding light about nutrition (Akşar, 2006).

Objectives

The scope of this study consists of sportsmen actively interested in all categories of fighting sports in Turkey.

The purpose of this study was to determine nutrition habits and information levels of sportsmen interested in fighting sports and to analyze the relation between them.

Material and methods

This research was conducted with the approval of the Staff Committee of the Van Erciş Youth and Sport Club, Bartin, and of the Ethics Committee of the Bartin University. All subjects included in the study were informed about the purpose of this research and the methods of dissemination. Subsequently, the whole group agreed to participate in the study and granted their informal consent for the publication of the obtained data.

Period and place of the research. This is a research with a general screening model. Screening models are research models that aim to define past or current situations like they are. The basic purpose in these models is to describe current events as they are. Screening models aim to define an individual or an object as a subject of research within its own conditions, without making any changes or leading to effects (Karasar et al., 1999). The research took place in the Van Erciş Youth and Sport Club, Bartin, Turkey, and we applied the questionnaire in the second half of 2015.

Subjects. The study was performed in 162 licensed sportsmen included in branches of Kickbox, Muay-Thai, Box, Taekwondo, under the Van Erciş Youth and Sport Club.

Tests applied. Taking permission from their club, previous scientific studies were evaluated to determine the sportsmen's nutrition habits and information levels (Bilgiç et al., 2002; Göral et al., 2006; Süel et al., 2006) and a "Nutrition Information Level Questionnaire" form developed by Göral **(**Göral, 2006) was used. Club trainers helped the sportsmen to fill in the questionnaires. The Nutrition Information Level Questionnaire form consisting of 45 questions including 13 personal information questions, 20 nutrition habit questions and 12 nutrition information questions was applied by the pollster after

explanations during the sportsmen's rest hours.

Statistical processing. Statistical estimations were done in the SPSS (version 15.0) program. Frequencies and percentage values of relevant data were estimated, the chi-square test was performed to analyze the relation between the sportsmen's demographic information and nutrition information level. When p value was smaller than 0.05, any difference between the groups was found to be significant.

Results

Looking at the distribution of the demographic information of sportsmen participating in the study, 66.7% of them (n=108) were in the 21-25 age group, 98.1% (n=159) were single, 58% (n=94) weighed 70-80 kg, and 35.8% (n=58) weighed 80 kg and over. Given the sportsmen's education background, education distribution mostly included graduates from high school and its equivalent, 93.8% (n=152). Of the sportsmen participating in the study, 34% (n=55) had an income level of 500-1000 ytl, 27.2% (n= 44) 500 ytl and less, 21.6% (n=35) 1000-2000 ytl, and 17.3% (n=28) 2000 ytl and more. In accordance with data resulting from the study, of all sportsmen, 78.4% (n=127) lived at home, and 21% (n=34) lived in places such as hotels, hostels, etc. (Table I).

Table I

Distribution of the sportsmen's demographic information

Demographic information concerning sportsmen		n	%
Age	21-25 years	108	66.7
	17-20 years	47	29
Marital status	Single	59	8.1
	Married	3	1.9
Sportsmen's weight distribution	70 kg and less	10	6.2
	70 kg-80 kg	94	58
	80 kg and more	58	35.8
Sportsmen's education background	Primary-secondary school	2	1.2
	High school and its equivalent	152	93.8
	Bachelor	5	3.1
	Master	3	1.9
Sportsmen's income situation	500 ytl and less	44	27.2
	500-1000 ytl	55	34
	1000-2000 ytl	35	21.6
	2000 ytl and more	28	17.3
Sportsmen's accommodation situation	Home	127	78.4
	Hotel, hostel, etc.	34	21
	Club dwelling-house	1	0.6
Total		162	100

Regarding the frequency distribution of the sportsmen's opinions about whether they had enough information about nutrition, 43.2% of the sportsmen (n=70) had enough information about nutrition, 35.8% of them (n=58) did not have enough information about nutrition, and 21% (n=34) did not have any idea about this topic. When asked about their information resources, 52% of sportsmen who considered that they had enough information (n=37) mentioned media as an information resource, 75.9% (n=123) reported that there were not nutrition experts in their clubs, 82.7% considered that there was a close relation between nutrition and success, and 64.2% thought that their body weight was within appropriate limits. 58% (n=94) answered "No" to the question "Do you know what carbohydrate loading is?" (Table II).

Table II

Distribution of the sportsmen's opinions about nutrition information levels.

Opinions regarding the nutrition information level		n	%
The sportsmen's opinions about whether they have enough information about nutrition	Yes	70	43.2
	No	58	35.8
	No idea	34	21
Information resource of sportsmen Considering that they have enough information (n=70)	Trainers	22	13.6
	Books	11	6.8
	Media	37	22.8
Whether a nutrition expert is available in the club	Yes	39	24.1
	No	123	75.9
Opinions concerning the relation between nutrition and success	No relation	6	3.7
	Close relation	134	82.7
	No idea	22	13.6
Do you think that your body weight is within appropriate limits?	Yes	104	64.2
	No	58	35.8
Do you know what carbohydrate loading is?	Yes	68	42
	No	94	58
Total		162	100

With the evaluation of questions aimed at determining nutrition information levels, the average of information points in sportsmen participating in the study was found to be 4.01. Looking at the frequency and percentage distribution of information points, 30.9% of sportsmen (n=50) scored 4 points, 27.8% (n=45) 3 points and 22.8% 5 points. The Chi-square test results were not statistically significant in terms of total points of nutrition information levels from the independent variables (demographic information) included in the research assessment ($p \geq 0.05$). To measure the nutrition information levels of sportsmen, the participants were asked 10 questions about nutrition information in the third part of the questionnaire, and nutrition information levels were determined with the given correct answers. The highest score was considered 10 and the lowest score was considered 0 within the assessments. The total nutrition information points of the sportsmen based on the questionnaires are given in Table III. Looking at the nutrition information points in Table III, 67.3% of sportsmen (n=109) scored 4 points and less, and 22.8% of them (n=37) scored 5 points. Also, 7.4% (n=12) scored 6 points, 1.9% (n=3) scored 7 points, and 0.6% (n=1) scored 8 points. None scored 0, 1, 9 or 10 points in the questionnaire measuring the nutrition information levels of sportsmen participating in the study.

Table III

Distribution of nutrition information points in sportsmen.

Distribution of nutrition information points concerning sportsmen			
Sportsmen's total points	n	%	Point groups
0 point	0	0	Low
1 point	0	0	
2 points	14	8.6	
3 points	45	27.8	
4 points	50	30.9	Medium
5 points/	37	22.8	
6 points	12	7.4	High
7 points	3	1.9	
8 points	1	0.6	
9 points	0	0	
10 points	0	0	
Total	162	100	

Groups of information points are given in the same table. According to these, sportsmen who had information points in the 0-3 point range were included in the "Low"

level information group, those who had information points in the 4-5 point range were included in the "Medium" level information group, and those who had information points in the 6-10 point range were included in the "High" level information group.

Table IV

Distribution of nutrition information situations in sportsmen.

Nutrition information situations		n	%
How many hours must elapse between the last meal and the competition?	True	65	40.1
	False	97	59.9
How many meals a day must a sportsman eat?	True	26	16
	False	136	84
What are carbohydrate content foods?	True	134	82.7
	False	28	17.3
Which one must be preferred as the last meal before competition?	True	90	55.6
	False	72	44.4
What is the approximate daily calorie need for a sportsman?	True	35	21.6
	False	127	78.4
In which foods is vitamin C mostly found?	True	153	94.4
	False	9	5.6
What CHO intake (g/kg/day) is sufficient for sportsmen?	True	30	18.5
	False	132	81.5
Which one cannot be considered when planning sportsmen's nutrition?	True	35	21.6
	False	127	78.4
Which one of the following two minerals do sportsmen need in a large amount?	True	27	16.7
	False	135	83.3
What is the most correct type of nutrition in your opinion?	True	54	33.3
	False	108	66.7
Total		162	100

In Table IV, the sportsmen's answers to the questions about the nutrition information level are given as true and false. The true and false answer rates of other 2 questions were similar, but other 6 questions were mostly given false answers by the sportsmen participating in the study; these are shown in Table IV. Only 2 of the questions aimed at determining the nutrition information level of the sportsmen were given correct answers.

Table V

Chi-square test results in terms of total nutrition information points from the age variable of the studied sportsmen.

Age levels		Unit	Nutrition information points			Total
			Low	Medium	High	
Age	17 and less	n	1	1	0	2
		%	.6	.6	.0	1.2
	17-20	n	18	29	0	47
		%	11.1	17.9	.0	29
	21-25	n	36	68	4	108
		%	22.2	42	2.5	66.7
	26-30	n	3	1	0	4
		%	1.9	.6	.0	2.5
	36 and more	n	1	0	0	1
		%	.6	.0	.0	.6
Total		n	59	99	4	162
		%	36.4	61.1	2.5	100

Looking at Table V, the sportsmen taking part in the research were mostly aged between 17-20 (n=47, 29%) and 21-25 (n=108, 66.7%). Relevant points of the nutrition information level for both age groups were shown as a medium level (n=97, 59.9%) in the same table. Similarly, when examining the chi-square test results in terms of total nutrition information points from the education background of the sportsmen (Table VI), the participating sportsmen were mostly graduates from high school and its equivalent (n=152, 93.8%), and the nutrition information points were at a medium level.

Table VI

Chi-square test results in terms of total nutrition information points from the education variable of sportsmen.

Education levels		Unit	Nutrition information points			Total
			Low	Medium	High	
Education	Primary-secondary	n	1	1	0	2
		%	.6	.6	.0	1.2
	High School	n	54	94	4	152
		%	33.3	58.0	2.5	93.8
	Bachelor	n	4	1	0	5
		%	2.5	.6	.0	3.1
	Master	n	0	3	0	3
		%	.0	1.9	.0	1.9
Total		n	59	99	4	162
		%	36.4	61.1	2.5	100

Table VII

Chi-square test results in terms of total nutrition information points from the income level variable of sportsmen.

Level of income		Unit	Nutrition information points			Total
			Low	Medium	High	
Income	500 ytl and less	n	20	23	1	44
		%	12.3	14.2	.6	27.2
	500-1000 ytl	n	20	32	3	55
		%	12.3	19.8	1.9	34
	1000-2000 ytl	n	14	21	0	35
		%	8.6	13.0	.0	21.6
	2000 ytl and more	n	5	23	0	28
		%	3.1	14.2	.0	17.3
Total		n	59	59	99	4
		%	36.4	36.4	61.1	2.5

According to Table VII, sportsmen with 4 different income levels participated in the study. Regarding this situation, sportsmen who had an income level of 500 ytl and less had low and medium points for nutrition information levels, with almost similar rates. The sportsmen included in other income groups had higher medium levels of the nutrition information points (Table VII).

Table VIII

Chi-square test results in terms of opinions concerning whether sportsmen have enough information about nutrition and total nutrition information points

Answers to question		Unit	Nutrition information points			Total
			Low	Medium	High	
Having enough information about nutrition	Yes	n	27	42	1	70
		%	16.7	25.9	.6	43.2
	No	n	22	34	2	58
		%	13.6	21	1.2	35.8
	No idea	n	10	23	1	34
		%	6.2	14.2	.6	21
Total		n	59	99	4	162
		%	36.4	61.1	2.5	100

Chi-square test results in terms of opinions regarding whether the sportsmen had enough information about nutrition and total nutrition information points are given in Table VIII. The table shows the following: from the participants (n=70) thinking that they had enough information about nutrition, 25.9% (n=42) had a medium level of information points, 16.7% (n=27) had a low level of information points, and 0.6% (n=1) had a high level of information points. The same situation was available for the high level of information points in sportsmen thinking

that they did not have enough information about nutrition (n=2, 1.2%) and sportsmen having no idea about the topic (n=1, 0.6%). Although answers of all sportsmen included in the study were different with regards to having enough information about nutrition, the nutrition information points were at a medium level (Table VIII).

Table IX

Chi-square test results in terms of information resources of sportsmen thinking they have enough information about nutrition and total nutrition information points.

Answers to question			Nutrition information points			Total
			Low	Medium	High	
Information resource	Sportsmen answering "No" and "No idea" to the question of having enough information about nutrition					92 56.8%
	From trainers	n	10	11	1	22
		%	6.2%	6.8%	.6%	13.6%
	From nutrition books	n	6	5	0	11
		%	3.7%	3.1%	.0%	6.8%
	From written and visual media	n	11	26	0	37
		%	6.8%	16.0%	.0%	22.8%
Total		n	59	99	4	162
		%	36.4%	61.1%	2.5%	100.0%

According to Table IX, the sportsmen thinking that they had enough information about nutrition indicated written and visual media as information resources (n=37, 22.8%), their nutrition information points being mostly at a medium level (n=26, 16%).

Discussions

When feeding sportsmen, the sportsmen's gender, age and daily physical activity are considered. Furthermore, arrangements aimed at training and competition periods are made in accordance with the sport type; foods are taken in sufficient amounts and in a balanced way. When organizing the sportsmen's nutrition, the sportsmen's height, body weight, body fat percentage, information levels regarding nutrition, nutrition habits, health status, social and economic conditions are taken into consideration (Güneş, 2009). The types of training technique, mechanical device, nutritional support or physiological technique that target exercise performance and adaptation to training are called ergogenic aids. These aids become effective in getting ready for individual exercises, increasing efficacy of exercises or increasing recovery after exercises (Kreider et al., 2011). To have a high level of performance, it is necessary to define food items, to know what ingredients they consist of, when and for how long they must be consumed, how many daily calories sportsmen need (Yıldırım et al., 2005; Martin et al., 2016). A Study of Nutrition Habits and Information Levels of Footballers Playing in Different Leagues by Göral (2008) asked questions about the footballers' education background, income levels, experts preparing their nutrition programs, relation between nutrition and success, CHO loading, meal skipping, alcohol and cigarette usage, liquid intake before competition, foods consumed before competition, regular use of supportive products, carbohydrate content foods, last meal preference before competition, vitamin C sources, daily CHO intake. In the statistical values of answers, significant differences were found between the groups at level $p< 0.01$; in the values of meal skipping, time between the last meal and competition, how many meals to eat a day and most required minerals at $p< 0.01$; in the values of nutrition information resources of sportsmen, liquid intake during training, care about nutrition before and after training at $p< 0.05$ (Göral et al., 2006). Alpar (2011) studied nutrition, physical activity and food supplement usage in body building sportsmen; he carried out his study in 50 amateur male body building sportsmen who performed body building training for at least two years, in five different sport centers located in Ankara. 72% of the participants used food supplements, while 28% did not use them. A statistically significant difference was found between body weight, height and body mass index (BMI) values of individuals using and not using food supplements. While there were differences in average energy, protein and carbohydrate amounts between the days when individuals trained and did not train, no difference was found in their average fat amounts (Alpar, 2011). Duman (2011) studied the nutrition information levels of swimmers aged 10-18 and their relations with some parameters; by comparing the sportsmen's nutrition information levels and nutrition habits and anthropometric measurements, he did not find any relations between them (Duman, 2011). Finally, there were points about sportsmen's nutrition habits requiring improvement; life-long healthy nutrition habits will have positive effects on both growth and development, on both health in adulthood and performance in sport. Taze's research (2012) on nutrition habits and information levels of voleyball players playing in the 1st League showed significant differences in nutrition habits depending on gender in voleyball players playing in the 1st League, in accordance with relevant results of nutrition habits and gender of voleyball players participating in the research (Taze et al., 2012). Differences were seen in nutrition habits and education background, balanced fulfillment of vitamin and mineral needs, taken calorie amount if necessary, protein content consumption, carbohydrate loading situations. While there were significant differences in questions related to a satisfactory last meal, consumption of high protein content foods, regular breakfast in terms of nutrition habits and years of playing voleyball, there were no significant differences in the responses of voleyball players to other questions. In accordance with the gender of voleyball players, in responses to questions about nutrition information levels, significant differences were seen in information about energy given by foods, water rates in the body, usage of energy sources in weight trials, information levels about water drinking during exercises, information about calcium containing food items, while no significant differences were found in responses to other questions. In Table II, although 43.2% (n=70) of the sportsmen included in the study thought they had enough information about nutrition, 67.3% of the sportsmen scored 4 nutrition information points and less. Indication of the media as an information source by the sportsmen thinking that they had enough information represented 22.8 (n=37), as seen in Table II. Unfortunately, there are no competent experts on nutrition in sport clubs in our country, so nutrition is ignored by both

club managers and trainers. This complies with the answer "No" to the question "Is there a nutrition expert in the club?" in our study by 75.9% (n=123) of the sportsmen. However, 82.7% (n=134) of the sportsmen answered "There is a close relation" to the question "Is there a relation between nutrition and success?", showing the effects of nutrition on sports performance, but they could not access correct resources to have enough information about nutrition. The report called "Sportsman Nutrition" prepared by the Nutrition Society Branch of the Food Security Office of the Health Ministry mentioned that nutrition forms a basis for health in each period of life. Also, the following statements were mentioned in the report: "Nutrition and exercises are basic principles of healthy life and nutrition is an important factor which increases sportsmen's performance. In today's understanding about modern sport nutrition, there is a consensus about that a balanced diet containing appropriate foods meets the sportsmen's needs. Sportsmen want to have information about issues such as applying nutrition plans to make daily training efficient and increase winning chances, learning something about the topic, finishing competition without tiredness, losing weight. In many sport branches in our country, sportsmen's nutrition is organized by professional groups having enough information including trainers at first, but even trainers at national team level do not have enough information about nutrition" (Göral et al., 2010). This report supports our findings. In accordance with data in Table IV, the true and false rates of the sportsmen's responses were similar for the question associated with the last meal type and time before competition; sportsmen mostly gave true answers to the question related to carbohydrates and vitamin C. They mostly gave false answers to other questions. Göral et al. suggested that most of the footballers included in the research knew carbohydrate content foods (72.2%) and preferred them before competitions (67.2%); the majority of footballers chose (85.3%) a correct menu as the last meal (stew, digestible, pulpless and less fatty foods) (Arıkan & Şanlıer, 2006). A percent of 81.8% of the sportsmen knew carbohydrate content foods correctly (Abood et al, 2004). Abood et al. chose sportsmen from a female football team and a female swimming team in Florida randomly, measured their nutrition information levels, and considered the sportsmen's nutrition information to be inadequate. The sportsmen's nutrition information was only based on training (Reading et al., 1999). Readink et al. determined nutrition information levels in sportsmen as insufficient items. Nutrition information tests were applied to 175 persons including adults and individuals at the development age. The results showed that the information level was 45% (Göral et al., 2010). These data are in accordance with our research findings.

Conclusions

No significant difference was found in the values of the sport information level between sportsmen groups having different ages, education and economic income levels in our study.

According to the data from our study, media is mostly seen as an information resource for suitable and balanced nutrition information and habits, which are important for increasing the sportsmen's performance. Thus, validity and reliability of information are not considered to be enough because of low information points.

Studies emphasize that trainers and sportsmen need a guiding light about nutrition. The results show that trainers must be supported by nutrition education, seminars, courses, panels, etc., and sportsmen must benefit from trainers as the closest information resource to them.

Conflicts of interests

No conflict of interests.

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CASE STUDIES
STUDII DE CAZ

Complex oral rehabilitation in an elderly patient with periodontal disease who exercises regularly

Reabilitarea orală complexă la o pacientă vârstnică, care prestează regulat exerciții fizice și care prezintă parodontopatie de senescență

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Abstract

Background. Physical exercise, balneoclimatic procedures, as well as the maintenance of individualized local hygiene conditions have been proven to be favorable to health even at advanced ages when these are kept within tolerance limits, having a beneficial impact not only on the general health but also on periodontal tissues.

Aims. The increase of the mechanical strength of teeth involves providing periodontal support adapted to composite restoration treatment, as well as improving the facial appearance, which plays a role in increasing the patient's quality of life.

Material and method. This paper presents a complex oral rehabilitation programme, evidencing periodontal disease and its therapy at an advanced age, in the case of a person who exercises regularly, a former high-performance skier.

Results. Senescent periodontal involution can develop within functional limits (absence of inflammation and tooth mobility), in the context of a healthy lifestyle, which includes: antioxidants, physical exercise, individualized oral hygiene through the use of auxiliary hygiene means, etc.

Senescent periodontal involution allowed us to perform complex individualized oral rehabilitation, with a role in reinforcing dental-periodontal support, with excellent clinical results.

Conclusions. The fact that the patient still exercises regularly, attends balneoclimatic therapy and strictly observes the diet prescribed by nutritionists continuously provides her with antioxidant intake offering a visible impact, including regarding periodontal tissues.

Taking into account geriatric dental particularities, adequate periodontal and prosthetic treatment by stages associated with patient compliance can lead to positive results, consisting of a long-term improvement of quality of life.

Key words: periodontal involution, senescence, prosthetic treatment, oral rehabilitation, physical exercise.

Rezumat

Premize. Exercițiile fizice, procedurile balneo-climaterice, cât și respectarea condițiilor locale de igienă individualizată se dovedesc a fi favorabile stării de sănătate, chiar și la vârste înaintate, atunci când acestea se realizează în limite de toleranță, având un impact benefic asupra sănătății, inclusiv asupra structurilor parodontale.

Obiective. Creşterea rezistenței mecanice a dinților are în vedere realizarea unui suport parodontal adaptat pentru un tratament protetic în sistem compozit, cât și îmbunătățirea fizionomiei la nivel local, aceste detalii având rolul de a crește calitatea vieții.

Metode. Lucrarea de față prezintă o variantă de reabilitare orală complexă cu evidențierea afecțiunilor parodontale, terapia acestora la vârsta a III-a, în cazul unei persoane care prestează exerciții fizice cu regularitate şi care în antecedente a precticat schi de performanță.

Rezultate. În ceea ce privește involuția parodontală de senescență, ea se poate instala în limite funcționale (lipsa inflamației și a mobilității dentare), în contextul unui stil de viață sănătos, care include: practicarea regulată a exercițiilor fizice, menținerea unei igiene orale individualizate prin utilizarea mijloacelor auxiliare de igienă, aportul constant de antioxidanți etc. Involuția parodontală de senescență ne-a oferit posibilitatea realizării unei reabilitări orale complexe individualizate, cu rol de consolidare a suportului dento-parodontal şi cu rezultate clinice excelente.

Concluzii. Având în vedere că pacienta prestează regulat exerciții fizice cu intensitate moderată, tratamente balneo-climaterice și respectă cu sticteţe un regim alimentar impus, alcătuit în colaborare cu specialişti în nutriție, toate acestea îi oferă în permanență un aport de antioxidanți cu impact vizibil inclusiv asupra parodonțiului.

Respectarea elementelor de geriatrie stomatologică, respectarea etapelor de tratament parodontal şi protetic, însoţite de complianţa pacientei, pot oferi rezultate pozitive legate de creşterea calității vieții pentru perioade lungi de timp.

Cuvinte cheie: involuție parodontală, senescență, tratamente protetice, reabilitarea orală, exerciții fizice.

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Introduction

Periodontal disease due to senescence is frequently found in dental care services. Therapeutic approaches vary depending on the degree of tooth mobility, response to local therapy, the number and position of residual teeth, the patient's general health status and compliance with treatment.

The permanent concern about health involves a continuous fight starting with adult age, particularly at older age. In this sense, moderate physical exercise, a diet including fibers and antioxidants, balneoclimatic procedures, individualized oral hygiene, avoidance of vicious habits with a negative impact on health must be adopted and adjusted to the needs of each individual (Crăciun, 2015; Albu & Lupu, 2015; Onose et al., 2015; Schwartz et al., 2012; Mureşan, 2015; Surdu et al. 2015). At the same time, general disorders that can be due to the presence of periodontopathogenic bacteria in the case of elderly patients who do not maintain adequate oro-dental hygiene should be taken into consideration. There are studies that demonstrate a predisposition to arterial stiffness, myocardial infarction, coronary heart disease, chronic obstructive pneumonia, etc. (Kapellas et al., 2014; Eberhard et al., 2014; Cueto et al., 2005; Wood & Johnson, 2005; Uneo et al., 2012; Si et al., 2012). Periodontal changes in elderly patients who do not meet these quality of life requirements are most of the time associated with periodontal pockets, tooth mobility, bleeding on periodontal probing.

The correlations between periodontal disease and advanced age are closely related to the lifestyle described above. The predisposition to certain periodontal disorders increases in time due to cumulative effects of the disease activity stages (Kuo at al., 2008).

Periodontal senescence (involution) is due to degeneration of connective tissue and collagen fibers, as well as to an atrophy of alveolar bone, which decreases in volume due to medullary bone with an increase of bone density. Under these circumstances, elderly patients who maintain adequate oral hygiene, adapted to local requirements, frequently have teeth with an elongated crown and a shortened root because of periodontal tissue involution; there is no pathological tooth mobility and the marginal gingiva is normally colored (Dumitriu et al., 2009).

Exclusion of vicious habits with a negative impact on the periodontium, as well as acceptance of individualized oral rehabilitation significantly improves the chances of maintaining an optimal periodontal status for long time periods (Waszkiewicz et al., 2013; D'Agostini et al., 2013; Lung, 2007).

Objectives

To evidence the presence of teeth with senescent periodontal involution, without pathological mobility, in the absence of osteoporosis due to antioxidant intake resulting from diet, moderate physical activities, as well as balneoclimatic procedures.

To demonstrate the presence of teeth with senescent periodontal involution, without periodontal pockets at an advanced age, under the conditions of individualized oral hygiene.

The possibility of dental restoration supported by teeth with senescent periodontal involution, when these do not show pathological mobility.

Hypothesis

This study aims to highlight the relationship between senescent periodontal involution in elderly patients and a lifestyle that includes individualized oral hygiene, moderate-intensity physical exercise, balneoclimatic procedures and an antioxidant diet.

Material and methods

This case study was approved by the Ethics Committee of the Iuliu Haţieganu University of Medicine and Pharmacy Cluj-Napoca, and the subject's informed consent was obtained.

Research protocol

a) Period and place of the research

On 16.09.2015, the patient presented to the dental office for complex oral rehabilitation, which was carried out until 25.11.2015.

b) Subject

History

Patient CV, aged 78 years, has an active lifestyle, being a former high-performance athlete. After the age of 50, the patient has practiced moderate-intensity sports activities and has attended spa treatments, within the limits of her health condition and the requirements of her treating doctor. She follows a diet established by a nutritionist, which includes antioxidants (Biha & Biha, 2015; Boşca, 2014; Mendoza-Núñez et al., 2014; Bawadi et al., 2011; Shimazaki et al., 2010).

At the time of presentation, the patient reported no chronic or acute general disorders, no allergies or osteoporosis; medication administered over a certain period of the year was based on vitamin therapy indicated by her family doctor.

The patient lost her maxillary front teeth in a ski accident at the age of 54; following the impact, the central incisors were expelled and the lateral incisors and the canines were fractured. The fractured teeth required immediate extraction. No soft tissues were lost following the impact. The rest of the teeth were lost as a result of caries complications. On 16.09.2015, the patient had six teeth present in the mandible.

c) Tests applied

Examination of the mucosa

The mucosa was supple, elastic, pink, without clinically detectable pathological changes.

Examination of the salivary glands

The salivary glands were permeable and there was a sufficient amount of saliva; there was no current or past history of hyposialia, xerostomia or hypersialia.

Prosthetic diagnosis

Maxillary – total edentation restored by removable full acrylic denture.

The total edentulous prosthetic field appeared as follows:

- broad edentulous ridge of medium height; neutral external side; smooth, semi-elliptical shape of the edentulous ridge;

- both maxillary tuberosities were non-retentive, and the sides were neutral and parallel to each other;

- the palate did not show an obvious torus palatinus requiring an adjustment of the treatment plan, and it had a slightly flat shape and a large size.

The entire surface of the prosthetic field was covered with a thick, well-vascularized mucosa, adherent to the periosteum, having a hard appearance.

Mandibular - T-A-T edentation (COSTA's classification) restored with fixed dentures (Popa, 2001a):

The patient clinically presented the following characteristics (Fig. 1):

- metal (Gaudent) FPD in 3.6-3.5-3.4
- acrylic FPD in 3.3-3.2-4.2-4.3
- acrylic FPD in 4.4-4.5

The acrylic bridges had no metal components, being recommended only for provisional purposes, and were radiotransparent (Popa, 2001b).

Dental and endodontic diagnosis

The teeth under the bridge body showed:

3.6 – crown and root destruction, with dental root separation and apical reaction in the mesial root

3.5 – crown destruction of carious etiology

3.4 – treated endodontically

3.3 – deep caries lesion under the bridge body and pulp hyperemia (Gafar & Iliescu, 2005)

4.2; 4.3 – residual roots of carious etiology

4.4 – underwent apical resection about 20 years before

4.5 – occlusal caries under FPD.

Periodontal diagnosis

Regarding periodontal disease, in this case senescent involution was found, which is characterized by gum-bone recession in some teeth, with an inverse crown-root ratio, the marginal gum showing a normal color, and tooth mobility was within physiological values.

- *The degree of gingival recession* – due to periodontal involution, 4 mm horizontal gingival recession was present in all teeth and all dental surfaces.

Given that all teeth were covered by FPD, the degree of gingival recession was calculated from the limit of the FPD neck to the free gingival margin, except for 4.3.;4.2., for which determinations could not be performed because of carious destruction.

- *The bacterial plaque index* – 1; bacterial plaque was seen on tooth surfaces only after scraping with the tip of the probe (Silness and Löe classification).

Bacterial plaque retention was favored by gum-bone involution and the FPD margins that had become inadequate because of their old age, as well as due to the inappropriate material used for a long-term FPD in the front mandibular region and in the fourth quadrant.

- *The calculus index* - 0 – no calculus (Dumitriu et al., 2009).

- *The gingival bleeding index* – 0 – absence of bleeding (MÜHELMANN's classification).

Tooth mobility

It was assessed using dental tweezers, by exerting moderate pressure in a horizontal plane and in an axial direction.

- 3.6, 3.5, 3.4, 3.3, 4.2, 4.3, 4.4, 4.5 - gr. 0 mobility, "physiological mobility" (Lung, 2007);

- 3.2 - gr. III mobility (Dumitriu et al., 2009; Lung, 2007), was a retainer of the acrylic FPD in the lower front region, maintaining four acrylic teeth along with 3.3 in cantilever, because of the carious crown-root destruction of teeth 4.2;4.3, which could no longer support the bridge body.

Probing depth

Probing of the teeth was performed in six surfaces for each tooth: mesiovestibular, midvestibular, distovestibular, distolingual, midoral, mesiolingual. Clinical probing depth was up to 1.5 mm.

Fig. 1 – Preliminary panoramic dental X-ray. During the X-ray, the patient had acrylic FPDs in 3.3-3.2-4.2-4.3, and 4.4-4.5, which are radiotransparent.

The patient had good oral hygiene, and the last treatments were performed about 15 years before.

Results

The treatment plan

The therapeutic scheme did not include dental implant placement because of the patient's limited financial resources.

The following were performed:

1. Cleaning of the oral cavity: scaling, removal of old FPDs, extractions of teeth 3.6, 3.2, 4.2, 4.3.
2. Filling of the crown of tooth 4.5 with glass ionomer filling material (Ketac).
3. Endodontic treatment for teeth 3.3; 3.5; restoration of endodontic treatment for tooth 3.4 (Gafar & Iliescu, 2005).

Unlike the great majority of elderly persons, in this case the patient had no problems tolerating the rubber dam, which caused no respiratory difficulties; the endodontic obturation was performed using the cold vertical-lateral condensation technique.

4. Teeth 3.5; 3.4; 3.3; 4.4 were reinforced with glass fiber posts luted with a dual-cure resin-based cement, from which the prosthetic stumps were made, without biological width being affected (Gligor & Gligor, 2012; Dinu, 2010) (Fig. 2).

Fig. 2 – Photo image following reconstruction of prosthetic stumps by reinforcement of glass fiber posts in teeth 3.5; 3.4; 3.3.

Observation

The crown destruction of the teeth that were maintained did not extend subgingivally; residual supragingival tooth margins were more than three millimeters (Dinu, 2010).

We emphasize the fact that residual teeth did not show mobility following FPD ablation (except for 3.2) or probing depth – "a clinical value of up to 2 mm on probing is considered physiological".

Prosthetic treatment included:

- *Fixed denture restoration*

In residual teeth, metal-ceramic FPDs joined at the point of contact, which also play a role in additional tooth stabilization, were made.

It is extremely important in such cases to protect the marginal periodontium and to create cervical embrasures for adequate cleaning, as well as to strictly follow all details and stages of the fabrication of metal-ceramic FPDs.

A Cr-Co alloy was chosen due to its hardness, and ceramic was selected for its chromatic, mechanical, dimensional stability and also, for its structure, which does not undergo changes in time.

- *Removable denture restoration*

It consisted of two classic removable dentures with a Flexite base and ceramic teeth. The mandibular removable partial denture was anchored by the residual teeth restored using a metal-ceramic FPD by means of wings, which are extensions of the Flexite denture base and establish dentomucosal contacts with the tissues, and at the same time protect the marginal periodontium due to foliation performed at this level (Fig. 3a,b).

Flexite used as a base for removable partial dentures provides clearly superior resistance and reliability compared to acrylic resins, the risk of fracture and porosity being much lower. At the same time, color is much more stable in time and thickness can be significantly more reduced.

The ceramic teeth of the denture had the same dimensional and chromatic characteristics as those of the fixed denture prosthesis.

a **b**

Fig. 3 – Photo images taken at the end of treatments. Image **b** shows a normal color of the marginal gingiva in 3.3; 4.4-4.5, with the anchored removable denture.

The periodontal status accompanied only by senescent involution, considering the absence of tooth mobility after FPD ablation, is due to a healthy lifestyle maintained through individualized oral hygiene, physical exercise, balneoclimatic treatments, dietary antioxidant intake; unlike other periodontal disorders, it appears as a factor favorable to prosthetic restoration under optimal local treatment conditions, when the general health status allows it.

The absence of periodontal pockets in this case is due to individualized oral hygiene, as well as to antioxidant effects resulting from moderate-intensity physical exercise, diet established by the nutritionist, and balneoclimatic procedures.

Additional reinforcement of residual teeth covered with metal-ceramic FPDs provides adequate additional support for the stabilization of a removable partial denture under optimal conditions.

Discussions

The 78-year-old patient had gum-bone recession in the residual teeth, and gingival inflammation proved to be clinically occult (Roman et al., 2008). The patient maintained adequate oral hygiene, which reduced many other risks caused by periodontopathogenic bacteria, such as: arterial stiffness, coronary heart disease, chronic obstructive pneumonia, etc. (Ueno et al., 2012; Si et al., 2012; Kapellas et al., 2014; Cueto et al., 2005; Wood & Johnson, 2005; Eberhard et al., 2014).

The patient's favorable periodontal status was due to individualized local hygiene, dietary antioxidant intake, physical exercise, and balneoclimatic procedures. There are studies demonstrating the presence of salivary antioxidants in elderly patients who perform physical exercise (Mendoza-Núñez et al., 2014; Hayashida et al., 2009) and also, studies that demonstrate the association of periodontal disease with a low level of physical activity and inadequate nutrition (Bawadi et al., 2011).

The presence of teeth with senescent periodontal involution that allowed periodontal, endodontic and prosthetic treatments provided a real support for the mandibular removable partial denture, significantly improving the quality of life of this patient (Ravald & Johansson, 2012).

The availability of mandibular periodontal support, as well as the favorable anatomical structure of the palate enabled complex oral rehabilitation close to the initial esthetic appearance of the patient's physiognomy (Fig. 4) (Armean & Rotaru, 2014).

Senescent involution did not require extraction, because the teeth were not mobile, representing a very important support for the mandibular denture. It is known that removable dentures in the mandible most frequently have precarious stability because of the reduced supporting surfaces and not least, the fact that the mandible is a mobile bone should be taken into account.

Regarding the maintenance of local periodontal status, the patient was aware of the need for long-term maintenance sessions for prevention of periodontal disease and early identification of problems, as well as for immediate initiation of antiinflammatory and biomechanical treatment if needed. The patient's visits to the dental office every six months will maximize the possibility of maintaining her natural teeth under optimal conditions of health, comfort, esthetic appearance and functionality during the entire course of her life.

a b

Fig. 4 – Comparison of initial physiognomic appearance with the final therapeutic result.

This periodontal status enabled composite restoration, performed after surgical, endodontic and dental treatments (Waszkiewicz et al., 2013; D'Agostini et al., 2013; Lung, 2007). Elderly persons who do not meet these quality of life requirements most frequently have periodontal pockets, bleeding on probing and tooth mobility.

Conclusions

1. Preserving the biological space of the marginal periodontium, by correctly positioning the limits of FPD and the margins of the removable partial denture, as well as correctly placing the points of contact allows to maintain a healthy periodontium.

2. The patient's adequate lifestyle in terms of dietary antioxidant intake, regular moderate-intensity physical exercise, balneoclimatic procedures, avoidance of vicious habits, appropriate hygienic means significantly improved the patient's chances of a favorable periodontal prognosis.

3. Providing additional support by immobilization of teeth with senescent periodontal involution, through a metal-ceramic FPD in this case, ensures much stronger periodontal support for a composite restoration treatment plan.

4. Endodontic treatments in the case of the patient's teeth with senescent periodontal involution add to the therapeutic results with an impact on periodontal structures, given the terminal vascularization of the teeth.

Conflicts of interests

There are no conflicts of interests.

Acknowledgments

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Assessment of an anterior mandibular protruding dental device in treating obstructive sleep apnea

Evaluarea unui aparat dentar de avansare anterioară mandibulară în tratarea apneei în somn de tip obstructiv

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Abstract

Background. Upper airway narrowing is implicated in the development of obstructive sleep apnea syndrome (OSAS). The facial appearance is influenced by breathing and multiple craniofacial factors. The use of a mandibular protruding device (MPD) during sleep is one method of establishing a wider air space in the pharynx and improving breathing during sleep.

Aims. The aim of this study was to manage the changes in the physical condition of a young male patient suffering from mild obstructive sleep apnea, after maxillary expansion and mandibular protrusion device treatment.

Methods. The patient presented to the dental office for complex oral rehabilitation. After clinical exams, a comprehensive analysis of dental casts, cephalometric and anteroposterior radiographs, the orthodontist indicated the opinion of a sleep medicine specialist. A cardiorespiratory polygraphy analysis was performed pre- and post-mandibular protrusion device treatment.

Results. Transverse skeletal measurements were not significantly affected. The measurement for maxillary lateral inclination was significant because of the active transverse force applied once a week through an expansion screw. During the treatment time of 13 months of wearing the mandibular protruding device, AHI decreased significantly from 4.6 to 1.6 events per hour of sleep.

Conclusions. The findings of this case indicate that anterior mandibular protruding dental appliances improve nocturnal breathing in adolescents, their physical and school performance. Functional oral appliances have a direct effect on tongue posture during sleep and help to stabilize the mandible in a more forward position. We cannot induce bone growth as the literature confirms, but a myofunctional appliance opens the pharyngeal airway space, posturing the mandible forwards and improving the respiratory parameters. The success of our orthodontic appliance in improving nocturnal breathing, school performance and the exercise capacity in OSAS patients has been attributed to enlarging the airway, by forward positioning of the mandible and reduced collapsibility of the pharyngeal structures.

Key words: obstructive sleep apnea, cardiorespiratory polygraphy, mandibular advancement, cephalometric measurements, dental appliance, exercise

Rezumat

Premize. Îngustarea căilor aeriene superioare este implicată în dezvoltarea sindromului de apnee obstructivă în somn (SAOS). Aspectul facial este influenţat de respiraţie şi de multipli factori craniofaciali. Folosirea unui dispozitiv de avansare mandibulară (MAD) în timpul somnului este o metodă de lărgire a spaţiului aerian la nivelul faringelui şi de îmbunătăţire a respiraţiei în timpul somnului.

Obiective. Scopul acestui studiu a fost acela de a evidenția schimbările în condiția fizică pentru un tânăr pacient de sex masculin, care suferă de apnee obstructivă în somn forma ușoară, după tratamentul de dilatare a maxilarului și avansare a mandibulei.

Metode. Pacientul s-a prezentat la cabinetul stomatologic pentru reabilitare orală complexă, iar după examene clinice, o analiză cuprinzătoare a modelelor dentare, radiografiilor cefalometrice și antero- posterioare, medicul ortodont a solicitat opinia unui specialist în medicina somnului, astfel efectuându-se o analiză cardio-respiratorie poligrafică înainte și după tratamentul

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cu aparatul dentar de avansare mandibulară.

Rezultate. Măsurătorile de la nivelul scheletului osos în sens transversal nu au evidenţiat modificări semnificative, dar măsurătoarea dilatării în zona laterală maxilară prin înclinare dentară a fost semnificativă datorită forţei active în sens transversal realizată prin intermediul şurubului de dilatare montat central şi rotat odată pe săptămână. Pe parcursul celor 13 luni de tratament, AHI a scăzut în mod semnificativ de la 4,6 la 1,6 evenimente pe oră de somn datorită purtării aparatului de avansare mandibulară.

Concluzii. Constatările acestui caz indică faptul că aparatul dentar de avansare mandibulară îmbunătăţeşte respiraţia nocturnă la adolescenţi, performanţele fizice cât şi şcolare în timpul orelor de curs. Aparatele orale funcţionale au efect direct asupra posturii limbii în timpul somnului şi ajută la stabilizarea mandibulei într-o poziţie anterioară.

Nu putem induce creşterea osului aşa cum confirmă literatura de specialitate, dar aparatul funcţional ajută la mărirea spaţiului faringian prin avansarea mandibulei, îmbunătăţind astfel parametrii respiratori.

Aparatul dentar aplicat a îmbunătăţit respiraţia nocturnă, performanţele şcolare, precum şi capacitatea de efort fizic în cazul subiectului tratat de apnee obstructivă forma uşoară, mărind căile aeriene superioare prin avansarea mandibulei, reducând astfel micşorarea structurilor faringiene.

Cuvinte cheie: apnee obstructivă de somn, poligrafie cardio-respiratorie, avansare mandibulară, măsurători cefalometrice, aparat dentar, efort fizic.

Introduction

Upper airway narrowing is implicated in the development of obstructive sleep apnea syndrome (OSAS) (Guilleminault & Chan, 2005). The importance of obstructive sleep apnea during growth is increasingly recognized and much attention has been paid to the influence of maxillofacial form on respiratory function during growth (Iwasaki et al., 2011; Iwasaki et al., 2013; Iwasaki et al., 2014; Warren, 1991). Other authors believe that facial appearance is influenced by breathing and multiple craniofacial factors (Linder-Aronson, 1970; Solow & Kreiborg, 1977), such as retrognathism of the maxilla and mandible, a narrow high-arched palate, increased lower facial height, elongated soft palate, macroglossia, temporomandibular joint abnormalities, decreased posterior airway space and inferiorly positioned hyoid bone (Backer, 2010; Lowe et al., 1986; Reily et al., 1983; Tangugsorn et al., 1995a; Tangugsorn et al., 1995b). Clinical consequences include excessive daytime sleepiness related to sleep disruption, daytime fatigue, behavioral and cognitive impairment or poor school performance (Bradley, 2009; Chan, 2008).

Pharyngeal airway obstruction is expected to improve with forward jaw movement by surgical maxillomandibular advancement or the use of mandibular advancement oral appliances. The use of a mandibular protruding device (MPD) during sleep is a method to establish a wider air space in the pharynx (Gale et al., 2000; Liu et al., 2000) and improve breathing during sleep. The MPD is a non-invasive method frequently used to treat obstructive sleep apnea syndrome (OSAS) or disturbing snoring (Fransson et al., 2001; Wilhelmsson et al., 1999).

The aim of this study was to manage the changes in physical fitness for a young male patient suffering from mild obstructive sleep apnea, after maxillary expansion and mandibular protrusion device treatment.

Hypothesis

Does a mandibular protrusion dental device have a major effect on upper airway structures, improving respiratory function and increasing quality of life in growing children?

Material and methods

This case study was approved by the Ethics Committee of the "Iuliu Haţieganu" University of Medicine and Pharmacy Cluj-Napoca, and the subject's written informed consent was obtained from the legal parent before enrollment in the study.

Research protocol

a) Period and place of the research

On 19.12.2013, the patient presented to the dental office for complex oral rehabilitation, which was carried out until 12.03.2015.

b) Subject

We analyzed the case of a 10-year-old male with transverse dentoalveolar deficiency, maxillary protrusion, a large overjet, lip incompetence, an Angle class I skeletal pattern, a mouth breather with long face syndrome, who had been transferred from a school office, because of symptomatic upper airway obstruction, with request for an orthodontic opinion (Fig. 1 a-f).

His sport teacher noticed he had difficulties in performing physical effort, in class he was not paying attention and he could not concentrate on school lessons.

A standard cephalometric radiograph was obtained for the subject, with the teeth in maximum intercuspation position and the Frankfort horizontal plane parallel to the floor, at the end of the treatment phase. The mandibular protruding dental device was produced at the Orthodontics and Dentofacial Orthopedics Clinic of the "Iuliu Haţieganu" University of Medicine and Pharmacy in Cluj-Napoca, Romania.

The oral device used was a custom-made, two-piece mandibular advancement appliance, and bite opening was adapted for the patient according to a wax constructed occlusion; in the sagittal plane, functional protraction of the mandible was in an edge-to-edge incisal position and in the vertical plane, a height of 5-6 mm was reached.

The appliance was fabricated in the orthodontic research laboratory from heat cured diacrylic resin, with an anterior bow for the correction of the frontal teeth, two expansion screws for transversal movement and four Adams retention clasps for maximum anchorage. The patient wore the functional oral appliance for 14 months, at the end of which cardiorespiratory polygraphy tests were repeated.

c) Tests applied

After clinical exams, a comprehensive analysis of dental casts, cephalometric and anteroposterior radiographs (Fig. 2 a,b), the orthodontist indicated the opinion of a sleep medicine specialist.

Fig. 1 (a-f) – Pre-treatment facial and intraoral photographs.

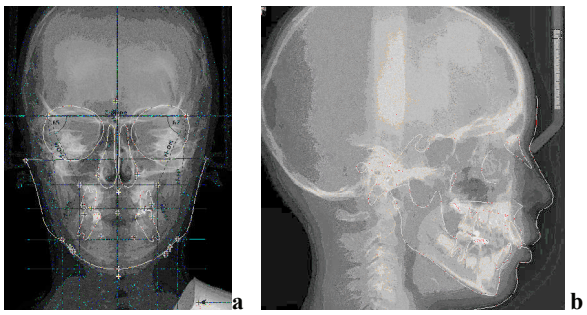

Fig. 2 (a, b) – Pre-treatment anteroposterior and lateral cephalometric head film provides information for diagnostic records and planning of orthodontic treatment.

In the Sleep Laboratory of the "Iuliu Hatieganu" University of Medicine and Pharmacy Cluj-Napoca, the standard protocol for clinical assessment was performed and subsequently, the 9-year-old boy underwent overnight cardiorespiratory polygraphy tests. A first time was registered as T1 – before and a second time T2 – after mandibular protrusion device treatment.

The Stardust Sleep Recorder manufactured by Philips/ Respironis (Andover, United States) was the diagnostic sleep device which included recording of nasal flow, thoracoabdominal movements, pulse oximetry and snoring. The entire record was manually scored for cardiorespiratory events. Total sleep time, the number and duration of complete upper airway obstructions, partial upper airway obstructions, and central and mixed apneas were scored. The apnea-hypopnea index (AHI) was calculated as the number of apneas and hypopneas per hour of sleep. According to the AHI, the severity of sleep apnea is as follows: no OSAS (AHI<5 events/hour), mild OSAS (5≤AHI<15 events/hour), moderate OSAS (15≤AHI<30 events/hour), severe OSAS (AHI≥30 events/hour).

The cephalometric landmarks and analysis depend on the methods of Tweed, Steiner and Munster. All cephalometric landmarks were located and digitized by the same observer (DOR). The digital cephalometric imaging system was PaX-Reve3D from Vatech 3D Global, ranked No. 5 (Russelsheim, Germany).

Results

Skeletal relations

Transverse skeletal measurements were not significantly affected.

Our device moved the mandible forward and had a restraining effect on the maxilla, as seen in Table I. The mandibular position in relation to the skull base, the SNB angle, was reduced on average by 1.35° and the SNA angle decreased by -1.55°, moving the maxilla back.

Dental relations

Inclination of the lower incisors according to the reference line ML mandibular plane angle increased from 86.56° initially (ILi/ML) to 88°. The inclination of the upper incisors according to the reference line NL (ILs/NL) was affected by 3.55°, from 22.89° to 19.34°.

Only the measurement of maxillary lateral inclination was significant because of the active transverse force applied through the expansion screw once a week (Fig. 3 a-f).

Fig. 3 (a-f) – Post-treatment facial and intraoral photographs.

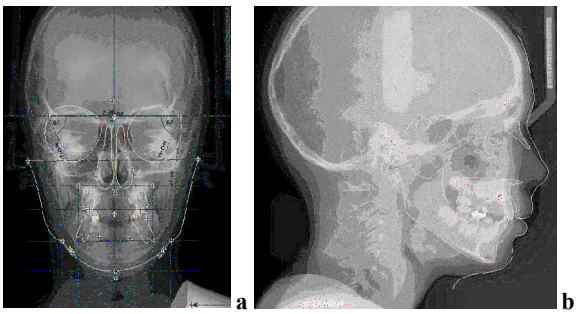

Fig. 4 (a, b) – Post-treatment anteroposterior and lateral cephalometric head film provides information about treatment outcome and maxillofacial alteration.

Table I

The results of the patient's cardiorespiratory polygraphy variables at the initial time (T1) and the final time (T2).

B.O.	Pre-treatment (T1)	Post-treatment (T2)
Age (years)	10	11
Weight (kg)	33	34
Height (m²)	1.47	1.48
Body mass index (kg/ m²)	15.3	15.5
Total sleep time (min)	546	546
Total number of complete airway obstruction events	37	13
Apnea/hypopnea index (events/hour)	4.6	1.6
Mean oxygen saturation (%)	97	97
Minimum oxygen saturation (%)	85	86

Respiratory parameters

During the treatment period of 13 months of wearing the mandibular protruding device, AHI decreased significantly from 4.6 to 1.6 events per hour of sleep. The initial pre-treatment rate of apneas-hypopneas was 37 events/hour of sleep and decreased to 13 events during the 546 minutes of sleep time when the appliance was worn. An improvement in the mean and minimum oxygen saturation after mandibular protruding device treatment T2 was observed compared with T1 (Table I).

Discussion

Some studies reported that the decrease of nasal resistance values after expansion resulted in a more nasal respiratory pattern, reducing mouth breathing (Gray, 1987; White & Cole, 1989).

Obstructive apnea is the cessation of airflow in the presence of breathing effort. Central apnea represents the cessation of both airflow and breathing effort. Mixed apnea is defined as no respiratory effort for at least 10 seconds, followed by at least three unsuccessful attempts to inspire before breaking the obstruction (Bjork & Skieller, 1972).

In this clinical case, the patient changed his respiratory pattern due to wearing the protruding device, but the measurement did not verify whether the increase of the nasal cavity and active growth of the maxillary structures (Bjork & Skieller, 1972) and growth of the nose (Scott, 1953) had some influence on the width of the nasomaxillary region.

Another study "*The effect of rapid maxillary expansion on nasal airway resistance"* reported that most patients found that their nasal breathing was improved after expansion, and those who perceived no change were

generally patients whose (nasal airway resistance) NAR was initially nearer to normal, and the change was small (Timms, 1986).

Taking into consideration the results of this study, it is suggested that in the evaluation of the relationship between transverse skeletal and dental effects after expansion, correction of lateral axial inclination was evidenced, without a significant change in skeletal parameters, as seen in Table II.

Table II

Cephalometric and posteroanterior radiographic variables before and after functional treatment indicate positive changes in maxillofacial structures.

Results	Unit	Minimum	Maximum	Before	After
FMA	°	16.00	35.00	16.06	20.75
IMPA	°	84.00	92.00	119.22	107.97
SNA	°	80.00	84.00	83.13	81.58
SNB	°	78.00	82.00	78.35	79.70
ANB	°	1.00	5.00	7.64	5.87
SN-OcP	°	14.00	14.00	14.72	14.41
SN-GoGn	°	30.00	30.00	24.94	24.40
Max1-NA	°	22.00	22.00	25.41	18.55
Mand1-NB	°	25.00	25.00	42.19	32.57
Wits	mm	0.00	4.00	6.61	4.88
ZR - ZL	mm	116	+/- 3	112	113
JR – JL	mm	62	+/- 3	61	62
NR – NL	mm	27	+/- 3	22	23
R1UpMb/6A-L1UpMb/A6	mm	50	+/- 3	44	49
R1LoM6/6B-L1LoM6/B6	mm	48	+/- 3	44	46
Go R/L	mm	76	+/- 3	69	70

Cephalometric analysis

The measured variables defined below are represented graphically in Table II.

1. FMA: When FMA<25, it indicates a horizontal growth pattern. When FMA>25, it indicates a vertical growth pattern.

2. Dental: Incisor – IMPA (incisor mandibular plane angle) • It indicates that the upright position of the mandibular incisor is normal • Balance and harmony of the lower facial profile • Mean: 87 degrees profile

3. Skeletal: SNA: The angle formed by the lines connecting the sella, nasion, and A point

4. Skeletal: SNB: The angle formed by the lines connecting the sella, nasion, and B point

5. Skeletal: The ANB angle indicates the magnitude of the discrepancy between the maxilla and the mandible. ANB is affected by the following factors other than anteroposterior discrepancy of jaws.

6. Skeletal: occlusal plane angle (SN - occlusal plane). The mean reading for normal occlusion is 14°.

7. Skeletal: SN-GOGN - mandibular plane angle (30). The anterior angle formed by the intersection of SN and GoGn is measured.

8. Max-NA - angle between the upper incisors to line NA

9. Mand-NB - angle between the lower incisors to line NB

10. The Wits appraisal is a measure of the extent to which the maxilla and the mandible are related to each other in the anterior-posterior (sagittal) plane.

11. ZR - ZL Zygomatic point - the most lateral aspect of the right and left zygomatic arch

12. NR – NL Nasal cavity - the most lateral aspect on the curvature of the nasal cavity

13. JR – JL Jugal point - deepest point on the curve of the molar process of the maxilla

14. R1UpMb/6A – right maxillary first molar – midpoint of the buccal surface of the maxillary first molar

15. L1UpMb/A6 – left maxillary first molar – midpoint of the buccal surface of the maxillary first molar

16. R1LoM6/6B - right mandibular first molar – midpoint of the buccal surface of the mandibular first molar

17. L1LoM6/B6 - left mandibular first molar – midpoint of the buccal surface of the mandibular first molar

18. Go R/L - Gonion – midpoint on curvature at angle of mandible, right and left

Krogman (1979) has mentioned that growth in width of both jaws, including the width of the dental arches, tends to be completed before the adolescent growth spurt and is minimally affected by adolescent growth changes.

This finding is according to the main mechanism of action with a MAS - the protrusion of the mandible and associated soft tissues (Fig. 4) improves the caliber of the upper airway (Chan et al., 2010) (Table I). It appears that the occlusal changes are not only predominantly dental as many authors have suggested. Our results align with those of Marklund (2006), who reported on the progression of occlusal changes in a subset of 51 patients treated for at least 5 years with a mono-block style of MAS. Marklund found overall that dental side effects increased with treatment time as well as more frequent use of the device; he also stated that overjet decreased continuously, but mandibular posturing and maxillary setback were also seen (Table II).

Schooling problems have been repeatedly reported in case series of children with OSAS, and in fact may underlie more extensive behavioral disturbances such as restlessness, aggressive behavior, excessive daytime sleepiness (EDS) and poor test performance. After improving the sleep quality for our subject, his school and physical performance increased, similarly to the results of the studies of some researchers (Ali & Stradling, 1996; Kheirandish-Gozal et al., 2010; Owens et al., 1998; Urschitz et al., 2004).

The body mass index predicts OSAS in older children and youth, especially in those who are overweight or obese (Daar et al., 2016), but our subject had a normal BMI and no significant weight changes were found.

Moreover, exercise could be helpful in improving numerous sequelae of OSA and vigorous physical activity was shown to be associated with a decrease in the OSA prevalence rate and subjective well-being (Ueno et al., 2009).

Conclusions

The findings of this case indicate that an anterior mandibular protrusion dental appliance improves nocturnal breathing and school performance in adolescents.

1. Improvement of sleep apnea may be attributed to the effect of the appliance on the oropharyngeal structures.

2. Oral appliances seem to work by enlarging upper airway patency at multiple levels and by improving muscle airway tone, and thus decreasing upper airway

collapsibility.

3. We cannot induce bone growth, as confirmed by the literature, but the myofunctional appliance opens the airway, posturing the mandible forward.

4. Functional oral appliances have a direct effect on tongue posture during sleep and help to stabilize the mandible in a more forward position.

5. Our mandibular advancement dental device changed the lower jaw position, improving respiratory functions, quality of sleep and exercise capacity in patients with mild to moderate OSAS.

Conflicts of interests

There are no conflicts of interests.

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REVIEWS
ARTICOLE DE SINTEZĂ

Protein food and amino acid supplements in athletes' diet
Hrana proteică şi suplimentele cu aminoacizi în dieta sportivilor

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Abstract

Good nutrition and strenuous exercise are the two pillars of sports performance. Feeding stimulates protein synthesis and, in combination with resistance exercise, induces muscle hypertrophy and strength. A very important macronutrient of this equation is protein. Athletes need high protein doses to stimulate muscle protein synthesis over muscle protein breakdown, and therefore, a positive muscle protein balance. A well-chosen nutrition plan should be based on ingredients made from whole foods and provide the needed protein. But, there are times when athletes choose to use protein supplements. High-quality supplemental protein, such as milk-based protein, whey and casein, help in maintenance or building of muscle mass, and the recovery process after effort. This article will discuss the need for high amounts of protein in enhancing muscle mass and performance, the quality of protein, the most used amino acid supplements, and the security for athletes in using increased quantities of protein and amino acids. The latest information found in scientific journals was analyzed, and the results of this paper will be helpful for athletes and sport specialists regarding optimal protein and amino acid intake in order to enhance sports performance and maintain the athletes' health.

Key words: athletes' diet, protein food, amino acids, protein supplements, creatine, citrulline.

Rezumat

Nutriţia adecvată şi antrenamentele fizice sunt cei doi piloni ai performanţei sportive. Hrana stimulează sinteza proteică şi, în combinaţie cu exerciţiile de rezistenţă, induce creşterea masei musculare şi a forţei musculare. Un macronutrient foarte important este în această ecuaţie proteina. Atleţii au nevoie de un aport crescut de proteine pentru stimularea sintezei proteinelor musculare peste catabolismul proteic şi, astfel, pentru a avea o balanţă pozitivă a proteinelor musculare. Un plan nutriţional bine ales trebuie să cuprindă alimente integrale, care să furnizeze toate proteinele necesare, calitativ şi cantitativ, dependent de particularităţile metabolice ale fiecărui sportiv şi de tipul de sport practicat. În anumite situaţii este necesară şi se recomandă utilizarea de suplimente proteice. Astfel de suplimente de înaltă calitate, cum ar fi proteinele din lapte, zer şi cazeină, ajută la menţinerea sau la construirea masei musculare în perioadele de efort fizic intens şi facilitează recuperarea după efort. În acest articol se va discuta şi sublinia necesitatea unui aport ridicat de proteine pentru creşterea masei musculare şi a performanţei sportive, calitatea proteinelor furnizate, dar şi suplimentele de aminoacizi recomandate, care pot fi utilizate în siguranţă de către sportivi. Acest articol sumarizează cele mai recente informaţii furnizate de articolele ştiinţifice din domeniu şi oferă date importante sportivilor şi specialiştilor din sport cu privire la aportul optim de proteine şi aminoacizi, în vederea creşterii performanţei sportive, asigurând totodată menţinerea sănătăţii sportivilor.

Cuvinte cheie: dieta sportivilor, proteine alimentare, aminoacizi, suplimente proteice, creatina, citrulina.

Introduction

Good nutrition and strenuous exercise are the two pillars of sports performance. The paramount nutritional recommendation for athletes should be to consume a well-balanced diet, based on ingredients made from whole foods. The athletes' body mass and body composition, part of the success in various sports, can be affected by nutrition science. The diet content should be precisely determined and deficiencies of energy, protein and other nutrients should be avoided. Feeding stimulates protein synthesis and, in combination with resistance exercise, induces muscle hypertrophy and strength. A very important macronutrient of this equation is protein. For athletes, nitrogen is balanced (the difference between protein intake and protein degradation) when protein intake reaches 1.2 g/kg body weight/day compared to 0.8 g/kg body weight/day in resting individuals (Poortmans et al., 2012). The latest data recommend ingesting 0.3 g/kg protein after workout and the rest of the amount every 3-5 hours over

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several meals (Moore et al., 2009; Phillips, 2014a). A well-chosen nutrition plan should provide the needed protein. However, there are times when athletes choose to use protein supplements. Reasons to use supplements include increasing performance, speeding up recovery, increasing energy, immune support, improving nutrition, and changing the body composition (Braun et al., 2009). Supplements should always augment a balanced nutrition plan; they should not be used separately. Athletes' supplementation should be guided by sport science professionals and dietitians, and not by family, friends or coaches (Braun et al., 2009).

Protein requirements, balanced with the right amino acid supplements, need to be personalized to the individual athlete and the energy availability. An effective eating plan associated with the right supplements can contribute to and positively impact sports performance (Thomas et al., 2016).

This article will discuss the need for high amounts of protein in enhancing muscle mass and performance, the quality of protein, the most used amino acid supplements, and the security for athletes in using increased amounts of protein and amino acids. The latest information found in scientific journals was analyzed, and the results of this paper will be helpful for athletes and sport specialists.

Protein food

Research demonstrates higher protein demands for athletes. The Recommended Dietary Allowance (RDA) for adults is 0.8 g/kg body weight/d, but athletes need to stay well above this recommendation and ingest quality protein food. Slow appearance of amino acids in the portal vein and subsequently in the systemic circulation after protein meals can raise nitrogen retention and diminish urea production (Moore & Soeters, 2015).

The need for protein depends on the sporting event. Endurance athletes seem to necessitate lower doses than weightlifters in search of muscle mass. Nevertheless, all athletes will benefit from a supply of 1.3-1.8 g/kg body weight taken in 3-4 meals daily (Phillips & Van Loon, 2011). Studies suggest that gain in muscle mass and strength is greatest with immediate post-workout supply of protein (Josse et al., 2010). Protein synthesis is optimal by the intake of 0.25-0.3 g/kg body weight of high biological value protein in the early recovery phase, less than 2 hours after exercise (Belen et al., 2010; Phillips, 2012). Post-workout protein diets should have higher leucine and other easily digestible amino acid content, thus optimizing muscle protein synthesis (Murphy et al., 2015; Helms et al., 2014). Research showed even better results for muscle mass and strength if the protein dose taken in the evening before bedtime was slightly higher (Snijders et al., 2015). Gains in muscle mass and strength are positively associated with total protein intake more than the timing (≤ 1 hour) of protein consumption (Schoenfeld et al., 2013).

More and more master athletes participate in endurance events such as long distance running and triathlon. Given the physical costs of endurance training sessions, the recovery methods are of utmost importance. Research proves that after these high energy demanding activities, physical recovery takes longer in master athletes than in younger, similarly fit athletes. Post-exercise protein feeding needed for muscle glycogen and protein resynthesis is constantly recognized. In this age group, dietary protein doses are even higher than 0.25 g/kg/meal, considering 4 meals daily, with attention to the leucine content (Doering et al., 2016).

There are times when athletes need to lose weight. For performance protection, this should be done in the training period, well before competition (Garthe et al., 2011), with hypocaloric diets that maximize loss of body fat and retain lean body mass (Mettler et al., 2010). In a hypocaloric diet, the aim is to lose weight, but not skeletal muscle and strength. Because protein has a thermic effect that exceeds both fat and carbohydrate and has the ability to preserve lean mass, it is recommended to increase the protein intake to 1.8-2.0 g/kg/day (Bosse & Dixon, 2012). There are results suggesting that whey protein may have a greater thermic effect than soy (Rubin et al., 2012). In order to have a negative energy balance the increase in protein consumption should come with a decrease in another macronutrient: fat. Athletes need carbohydrate to achieve performance (Churchward-Venne et al., 2013; Phillips, 2014a).

Protein source seems to be very important. In a study on isonitrogenous and isocaloric diets, two protein sources were evaluated: the first group consumed leucine from whey, while the second group consumed lysine and leucine from wheat. Total caloric intake was divided 16/54/30 between protein/carbohydrate/fat. After 11 weeks of study, the first group had 9.7% body fat, and energy was deposited 30% in adipose tissue, 70% in skeletal muscle. The second group had 12.4%, 55%, 45% body fat, respectively. The results are much more beneficial for the first group, which had leucine from whey (Moulton et al., 2010). Likewise, a research on weightlifters with isocaloric and isonitrogenous diets from two sources – whey and soy, showed the best outcome for the whey diet (Volek et al., 2013).

Two frequent methods to determine the overall quality of protein are net protein utilization (NPU) and protein digestibility corrected amino acid scores (PDCAAS). Based on these methods, the best protein source is whey. It contains a multitude of biologically active proteins and peptides (b-lactoglobulin, a-lactalbumin, glycomacropeptide, lactoferrin, lactoperoxidase, immunoglobulins, IGF/ insulin-like growth factor). Whey protein contains more essential amino acids per weight than other sources, it is a rich source of branched-chain amino acids, and a rich and balanced source of sulphur amino acids (methionine, cysteine - precursors to the potent intracellular antioxidant glutathione). Thus, whey is considered a better protein source than casein, soy, eggs, meat or fish (Smithers, 2008; Devries & Phillips, 2015; McLain et al., 2015). Whey protein alone or a blended protein supplement containing all the essential amino acids, with a longer aminoacidemia period and several digestion rates, clearly enhances muscle protein synthesis with respect to the ingestion of an iso-energetic equivalent carbohydrate or non-whey protein supplement in resistance-training individuals (Reidy et al., 2013; Naclerio & Larumbe-Zabala, 2016).

A higher protein diet could be beneficial for optimal immune function and recovery from intense periods

of training. It reduces excessive inflammation and immunosuppression, it helps in oxidative stress, muscle fatigue and muscle injury (Cruzat et al., 2014).

Studies demonstrate that higher protein diets, despite a widespread belief, will not compromise renal function (Tipton, 2011; Phillips, 2014b). Consuming moderately high-protein (1.0 to 1.2 g/kg/day) or even high-protein (>1.2 g/kg/day) diets does not disrupt calcium homeostasis and is not detrimental to skeletal integrity. Protein may help preserve bone mass during weight loss by stimulating insulin-like growth factor and increasing intestinal calcium absorption (Jesudason et al., 2013; Cao et al., 2014; Tang et al., 2014). In another study, male and female weightlifters combined anaerobic exercise and a very high protein diet, 3.4 g/kg/day, which is over four times the recommended dietary allowance. After 4 months there were no side effects, no harmful consequences on blood lipids, hepatic or renal function (Antonio et al., 2015; Antonio et al., 2016).

Amino acid supplements

Protein augmentation can be achieved with the use of dietary protein supplements. This is a convenient way to reach the target level of protein intake when access to quality food is restricted or there is no time for elaborate meals. Protein supplementation pre/post-workout or competition can enhance muscle mass and performance if the training stimulus is consistent and the dietary intake is adequate (Pasiakos et al., 2015). High quality protein or amino acid supplements can be comfortable, time-saving, and an adequate synchronicity between ingestion and competition can bring benefits in many anaerobic or aerobic sport events (Kreider & Campbell, 2009). Because gastrointestinal complaints frequently manifest in young athletes before competitions, when they are advised to avoid high-carbohydrate, high-fat foods at least 2-3 hours before events (Orasan et al., 2014), the importance of adding protein supplements to improve performance is even higher.

Citrulline, a non-essential amino acid found mostly in watermelon, whose name is derived from the Latin word Citrullus, is used as a sports performance and cardiovascular health supplement. Citrulline supplementation can raise energy levels, improve endurance in aerobic and anaerobic exercise, and stimulate muscle protein synthesis (Cynober et al., 2013). In the kidneys, after ingestion, citrulline is converted to arginine, a substrate for NO synthase. Citrulline is better absorbed in the intestines than arginine itself (Schwedhelm et al., 2008). Nitric oxide is a modulator of mitochondrial respiration and muscle energy metabolism during exercise.

Research confirms that both forms used in products, L-citrulline and citrulline malate, provide increases in exercise performance. Supplementation with citrulline malate can be beneficial for moderately trained athletes (Sureda & Pons, 2012), and also for highly trained athletes. Supplementation with 8 g citrulline malate before workout may be beneficial for improving exercise performance in advanced resistance-trained men. Blood pressure, heart rate, and blood lactate were comparable between placebo and citrulline malate groups (Wax et al., 2015). L-citrulline supplementation significantly raised plasma L-arginine levels, improved the athletes' muscle fatigue and concentration immediately after exercise (Suzuki et al., 2016). In a controlled laboratory environment, by consuming a blend of 8 g citrulline malate and 12 g dextrose one hour before test, a group of female athletes aged over 40 improved their aerobic and anaerobic performance (Glenn et al., 2016).

One study showed that 8 g citrulline malate supplementation can increase athletic performance in high-intensity anaerobic exercises with short rest times, and muscle soreness was also relieved (Perez-Guisado & Jakeman, 2010). In another study, trained cyclists were randomly assigned to one of two groups: control or supplemented with 6 g citrulline malate, 2 hours prior to a 137-km cycling stage. Plasma growth hormone concentration, which increases with exercise (Lencu et al., 2016), was higher in the citrulline malate supplemented group, which also showed an increase in the use of amino acids, especially branched-chain amino acids (Sureda et al., 2010).

Adding reduced glutathione (GSH) to L-citrulline may protect against the rapid oxidative destruction of nitric oxide. A small human trial was conducted, where resistance-trained males were randomly assigned to orally ingest a placebo, L-citrulline (2 g/day), GSH (1 g/day), or L-citrulline (2 g/day) + GSH (200 mg/day) for 7 days, followed by a resistance exercise session. Athletes taking L-citrulline along with GSH had significantly higher nitrite and nitric oxide levels compared to placebo or L-citrulline alone (McKinley-Barnard et al., 2015).

Short-term citrulline administration less than 10 g appears to be safe and well-tolerated in humans (Moinard et al., 2008).

Beta-alanine, a modified form of alanine, is a non-proteinogenic amino acid produced endogenously in the liver and found mostly in meat. The mechanism by which beta-alanine supplementation could have an ergogenic effect is still debated; the common view is that beta-alanine supplementation significantly raises muscle carnosine concentration, better than carnosine itself (Derave et al., 2007; Everaert et al., 2013). Carnosine, synthesized in skeletal muscle from beta-alanine, plays a significant role in muscle pH regulation and apparently has anti-aging actions (Hipkiss, 2009). Having muscle buffer capacity, carnosine delays the onset of muscular fatigue. Supplementation with beta-alanine, best done with a sustained-release formulation to avoid urinary spillover and paresthesia symptoms, is used by athletes to improve their high-intensity anaerobic performance, increase resistance training performance and training volume in team sports (Artioli et al., 2010; Harris & Stellingwerff, 2013; Bellinger, 2014). Beta-alanine supplementation with 4 to 6 g daily for at least 2 to 4 weeks had a positive effect on physical performance, muscle relaxation speed, and neuromuscular fatigue (Hannah et al., 2015; Trexler et al., 2015). When beta-alanine supplementation was taken with meals, muscle carnosine increased more (+64%) than when it was ingested between meals (+41%). In this 5-week study, with daily 4.8 g beta-alanine supplementation, slow-release and pure beta-alanine appeared equally effective

(Stegen et al., 2013).

However, extended cellular exposure to beta-alanine may reduce circulating and cardiac levels of taurine, which leads to functional and structural cardiac changes and an increase in oxidative stress in deficient animals (Parildar et al., 2008; Pansani et al., 2012). Hence, until there is sufficient evidence confirming the safety of beta-alanine supplementation and its side effects in humans, caution is advised in using beta-alanine as an ergogenic aid (Quesnele et al., 2014).

Creatine, a nitrogenous organic acid, is produced endogenously from glycine and arginine, mostly in the liver and kidneys, at an amount of about 1 g/day. 95% of the body creatine stores are found in skeletal muscle. It increases phosphocreatine muscle stores, boosting, in higher energy demands, the ability to resynthesize ATP, more and more recognized for its pleiotropic effects (Wallimann et al., 2011).

The antioxidant activity of creatine appears as an additional non-energy related mechanism with valuable effects in a wide number of human degenerative diseases and conditions (Sestili et al., 2011). Also, it can act as a blood antioxidant, protecting cells from oxidative damage, genotoxicity, and can potentially expand their lifespan (Qasim & Mahmood, 2015). Creatine has been found to enhance cognition; it acts as a neuroprotectant and improves mitochondrial efficiency (Rae & Broer, 2015; Rahimi et al., 2015; Cunha et al., 2016).

Supplementation with creatine increased muscle strength in athletes, but did not affect explosive performance (Wang et al., 2016). The results on body composition and muscle strength were superior when taking 5 g creatine immediately post-workout compared to pre-workout (Antonio & Ciccone, 2013). Two creatine monohydrate supplementation protocols demonstrated efficiency: one protocol with supplements in the amount of 0.1 g/kg/day for 28 days; another protocol with supplements of 0.3 g/kg/day for at least 3 days and subsequently, 3-5 g daily for 28 days (Cooper et al., 2012). The sports rehabilitation field could benefit from creatine supplements considering that creatine may be useful in preventing muscle damage from high-intensity exercise and aiding in the recovery process. Further research is needed to find out how creatine does that (Kim et al., 2015). Because creatine has the ability to take water from the bloodstream into skeletal muscle, adequate fluid intake is recommended (Munoz et al., 2015).

Several studies showed that 5 g/day creatine supplementation, together with a normal or high-protein diet, proved to be safe for kidney function either in healthy resistance-trained individuals or in type-2 diabetic patients (Gualano et al., 2011; Lugaresi et al., 2013). However, the cytotoxic effects of creatine supplementation should always be considered on an individual level.

Branched-chain amino acids (BCAAs) - leucine, isoleucine, and valine - are essential amino acids metabolized directly in muscles. BCAAs appear to increase protein synthesis in muscle, positively influence muscle fatigue, and participate in the homeostasis of glucose. As no minimum or maximum limits of BCAAs have been set, in a 2/1/1 ratio of leucine/isoleucine/valine, daily proposal is 40/20/20 mg/kg body weight. To keep a constant ratio of BCAAs in the body, the use of this mixture is advised, rather than individual leucine. No toxicity of BCAAs has been observed even at high doses (Brestensky et al., 2015).

A serum drop in BCAAs appears during exercise, thus BCAAs supplementation might be necessary. A serum decline would normally cause a tryptophan influx into the brain, followed by serotonin production, which causes fatigue. Branched-chain amino acids (BCAA) compete with tryptophan and tyrosine for transporters at the blood-brain barrier. For example, raising blood tyrosine or tryptophan levels raises their uptake into the brain; thus, conversion of tyrosine and tryptophan to catecholamines and serotonin respectively, while raising blood BCAAs levels, raises their uptake into the brain. One study showed that administration of BCAAs with tyrosine, a mixture that brings a drop in serotonin but prevents a fall in dopamine, is an effective way to improve physical performance (Fernstrom, 2013).

A very recent study reported that BCAA supplementation in athletes on a hypocaloric diet can maintain lean mass and preserve skeletal muscle performance while reducing fat mass (Dudgeon, 2016). Dieter et al. (2016) agreed in general with the aforementioned study, but argued that there were small statistical flaws in the study.

Carnitine, an amino acid involved in lipid metabolism, is synthesized in the liver and kidneys from the amino acids lysine and methionine. It transports long-chain acyl groups from fatty acids into the mitochondrial matrix, so they can be broken down through beta-oxidation to acetyl CoA to obtain usable energy via the citric acid cycle. L-carnitine, the biologically active form, has also been found to increase nitric oxide production when combined with aerobic exercise (Bloomer et al., 2009). This relaxes the smooth muscles of the blood vessels, causing them to widen, allowing more blood to flow through. It can further promote muscle endurance through better delivery of nutrients and oxygen to working muscles, along with helping to improve recovery after exercise (Huang & Owen, 2012). Supplementation with 2 g L-carnitine for 3 weeks had a positive effect on muscle tissue damage and soreness after exercise, on free radical formation, and on muscle tissue repair. However, muscle power and strength were not affected by supplementation (Ho et al., 2010). A dose of 1.5 g/day glycine propionyl-L-carnitine supplementation for a 28-day period raised sport performance and anaerobic work capacity more than 3.0 g or 4.5 g doses (Jacobs & Goldstein, 2010).

Increased carnitine content can speed up energy expenditure during low-intensity exercise and prevent an increase in adipose tissue (Stephens et al., 2013). L-carnitine supplementation in conjunction with a carbohydrate beverage, which elevates circulating insulin, can increase retention of carnitine in the body (Stephens et al., 2007). Adding whey protein to a carbohydrate beverage reduced carnitine accumulation; thus a mixture of carbohydrate and protein beverage could inhibit chronic muscle carnitine accretion (Shannon et al., 2016).

It is worth mentioning that two contradictory research outcomes exist. One supports that dietary L-carnitine, abundant in red meat, might contribute to the link between high levels of red meat consumption and cardiovascular

disease risk (Koeth et al., 2013). The other one, based on two meta-analyses, concludes that supplementation with L-carnitine is effective in the secondary prevention of cardiovascular disease (DiNicolantonio et al., 2013; Shang et al., 2014). Further studies are needed to determine the safety of carnitine in athletes under all conditions.

Conclusions

1. Athletes need high protein doses to stimulate muscle protein synthesis over muscle protein breakdown, and therefore, a positive muscle protein balance.

2. Optimal doses depend on the end scope or the sport event, can be higher than 1.0-1.2 g/kg/day, and should come from nutritious animal and plant protein sources. High-quality supplemental protein, such as milk, whey and casein-based protein, helps in maintenance or building of muscle mass, and the recovery process after effort. The added convenience may be of interest for athletes.

3. Ideal health and performance can be achieved through optimal variety, quantity, quality, and timing of consumption of nutrients and amino acid supplements.

Conflicts of interest

The authors declare that there are no conflicts of interest.

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Vasile Mureșan, the man, the coach and the professor
Vasile Mureșan, omul, antrenorul și cadrul didactic

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Abstract

The 50th anniversary of the winning of the first title of the National Junior Men's Basketball Champion by the Student Sports School team trained by Professor Vasile Mureșan was an occasion for us to write a paper presenting the most significant moments and results of the activity of this iconic specialist of juvenile male basketball in Cluj-Napoca.

In the first part, the authors refer to the period of his early professional training, his activity and the results obtained by the Student Sports School teams during his first years as a coach. Then, the main achievements in national school competitions, national student sports school competitions and national junior championships are reviewed. The paper also presents the results of the national junior basketball teams in the Balkan Championships and the Friendship Competition in the period when Vasile Mureșan was a member of the technical staff in charge of their training. The final part highlights his activity and results as a pre-university teacher and a professor at the Polytechnic Institute in Cluj-Napoca.

Key words: coach, junior basketball, sports history, Vasile Mureșan

Rezumat

Aniversarea a cincizeci de ani de la cucerirea primului titlu de campioană națională de juniori la baschet masculin de către echipa Școlii Sportive de Elevi, antrenată de profesorul Vasile Mureșan, ne-a determinat să elaborăm o lucrare care să prezinte momentele și rezultatele cele mai semnificative ale acivității acestui specialist emblematic pentru baschetul masculin juvenil din Cluj-Napoca.

În prima parte, autorii se referă la perioada sa de formare profesională inițială, activitatea și rezultatele obținute de echipele Școlii Sportive de Elevi în primii săi ani ca antrenor. Apoi, sunt trecute în revistă principalele realizări la concursurile republicane școlare, cele ale școlilor sportive de elevi și campionatele naționale de juniori. De asemenea, lucrarea prezintă rezultatele echipelor naționale de juniori ale României la Campionatele Balcanice și Concursul Prietenia în perioada când Vasile Mureșan a făcut parte din colectivul tehnic care a asigurat pregătirea acestora. Partea finală se referă la acivitatea și rezultatele sale în calitate de cadru didactic în învățământul preuniversitar și la Institutul Politehnic din Cluj-Napoca.

Cuvinte cheie: antrenor, baschet juniori, istorie sportivă, Vasile Mureșan.

Introduction

This paper continues the series of articles that present the activity of representative athletes and coaches of Cluj sports movement (Maroti et al., 2014; Doboși et al., 2013; Manasses et al., 2016).

In Cluj-Napoca city, basketball has gained a place of honor in the history of Romanian sport through the results obtained during the course of years both by senior and junior players (Cacoveanu, 1991). Alongside athletes, coaches, through their vocation, through the way in which they use their professional competence, their psycho-pedagogical, moral and socio-relational skills in the selection, training and education of athletes, are at the head of the entire activity, being responsible for the quality and efficiency of work carried out to obtain sports performance. Vasile Mureșan, along with Horia Pop, Voicu Moldovan, Liviu Moraru, Elena Popescu, is a coach with a recognized contribution to the best achievements of junior basketball players in Cluj (Radu et al., 1993).

Today, half a century after the Student Sports School team trained by Vasile Mureșan won the first title of National Junior Champion for Cluj basketball, we consider that this anniversary is an occasion to write a paper recalling and revealing the activity of one of the most representative specialists who worked in Romanian juvenile basketball in the 1970's.

We believe that the elaboration of papers related to such subjects is of interest to many sport lovers. Also, the presentation of the work and achievements of sports

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personalities is a homage to the top representatives of this field of activity and contributes to the knowledge and promotion of sports history in our city.

The years of childhood and early professional training

Vasile Mureșan was born on 22 November 1939, in Bădești, Cluj county. Ever since his childhood and adolescent years, he demonstrated a special aptitude for sport. After he graduated the Boys Middle School no.1 in Turda in 1956 (***, 1956), he attended the Institute of Physical Culture and Sport in Bucharest, the most prestigious higher education institution in Romania, which trained physical education teachers and coaches in various sports branches (Mureșan, 1967). In order to meet the specific requirements of the faculty, he worked hard both intellectually, by participating in courses and seminars and by individual study, and physically, in practical classes, training programs and competitions. His tenacity, his wish to acquire professional knowledge and skills, his seriousness and diligence throughout the study years, his determination in pursuing his goal to become a good physical education teacher and coach helped him cope with the demands of student life and obtain good results. In the summer of 1961, Vasile Mureșan was one of those who started with confidence and youthful enthusiasm on the difficult road of the profession for which they had trained for four years in the Institute of Physical Culture (***, 1961).

The first years of training as a basketball coach

Although following an administrative error he had to work in a different specialty than that for which he had trained during the study years, Vasile Mureșan started his coach career with confidence, with a wish to prove that he could successfully fulfill his task, showing a great work capacity.

Ever since the first months, he realized that in order to meet the exigencies of performance he had to study, to make efforts to measure up to the requirements. In addition to individual efforts for a better knowledge of the basketball game, for improving the specific skills of this sport, he attended the training courses organized by the College of Coaches of the Union of Physical Culture and Sport of the Cluj Region (***, 1962b) and the training courses for a second specialization, basketball, at the Institute of Physical Culture (***, 1962a). Following their graduation, in 1963, he obtained a 3rd category basketball coach license (***, 1963).

Since the first days, the training sessions run by Vasile Mureșan were characterized by a thorough preparation, a high methodical level, punctuality, discipline, high requirements, and personal example. Although in the years over which he worked with the first generation of players he did not obtain remarkable performance, this apprenticeship period was beneficial for his evolution as a basketball coach, because it allowed him to optimize his work methodology and to gain experience, laying the foundations of future performance. One of the aspects of his activity in this period, appreciated by the best Romanian basketball specialists, was the way in which he achieved primary selection, particularly from an anthropological and genetic point of view (Stănculescu, 1966).

His recognition as a coach

Over the following years, the coach's work, professionalism and high demands, as well as the players' wish to progress and prove themselves led to a qualitative leap. A first remarkable result for coach Vasile Mureșan was the winning of the first place by the team of the Student Sports School Cluj in the final of the National Student Sports School Competition that took place in the summer of 1965, in Gheorgheni (***, 1965). This was the first confirmation of the quality of his work, of his coaching skills.

Being a skillful and ambitious coach aiming at high performance, he created a homogeneous team slowly and consistently, he optimized training, so that in 1966 the Cluj team won the first place in all national school and junior finals. The team of "Nicolae Bălcescu" High School no. 8 ranked first in the National School Competition in Timişoara (Alexe & Stama, 1967). In Mediaş, Professor Mureșan's students won the National Student Sports School Competition (***, 1966). The Student Sports School team, formed by Gheorghe Roman, Tiberiu Bartha, Stelian Scurei, Petru Aştilean, Radu Vana, Lucian Andreiţiu, Viorel Moisin, Dan Roman, Dan Nicolau, Ion Munteanu and Ștefan Maroti, won the gold medals in the finals of the National Junior Championships in Bacău (Stănculescu, 1966).

Fig. 1 – The team of the Student Sports School in Cluj-Napoca, ranking first in the 1966 final of the National Junior Championships. Back row: Viorel Moisin, Stelian Scurei, Lucian Andreiţiu (team captain), Vasile Mureșan (coach), Gheorghe Roman, Dan Roman, Tiberiu Bartha. Front row: Radu Vana, Petru Aştilean, Dan Nicolau, Ion Munteanu, Ștefan Maroti (Source: ***, 1966)

Vasile Mureșan proved to be a valuable coach, skillfully managing the transition between generations, relying on athletes gifted for basketball, committed to hard work and performance. His work was rewarded by the winning in 1967 of a new National Junior I Champion title by Lucian Andreiţiu, Viorel Moisin, Dan Roman, Marius Buleu, Radu Vana, Ștefan Maroti, Ion Munteanu, Miklos Szekely, Bebe Leventi, Mircea Săvuţ, Nicolae Coroianu, Octavian Teușan

(***, 1967). In 1971, the team of the School Sports Club Cluj-Napoca trained by Vasile Mureşan, which included Alexandru Vidican, team captain, Marius Crăciun, Ştefan Mathe, Marinelli Banu, George Coadă, Tudor Ursache, Sorin Vidican, Andrei Ganea-Roth, Dan Sălăgean, Liviu Simplăceanu, ranked second in the final of the National Junior I Championships in Sibiu (Radu, 1993).

Table I

Results in national school and junior competitions

Year	Competition	Place of the competition	Ranking
1965	National School Competition	Mediaş	I
1965	National Student Sports School Competition	Georgheni	I
1966	National Student Sports School Competition	Mediaş	I
1966	National School Competition	Timişoara	I
1966	National Junior Championships	Bacău	I
1969	National Junior II Championships	Constanţa	I
1967	National Junior Championships	Cluj	I
1971	National Junior Championships	Sibiu	II
1972	National Junior Championships	Ploieşti	II
1972	National Junior II Championships	Bacău	III

Fig. 2 – The team of the Student Sports School in Cluj-Napoca, ranking second in the 1971 final of the National Junior I Championships. Back row: George Coada, Tudor Ursache, Marius Crăciun, Ştefan Mathe, Marinelli Banu. Front row: Andrei Ganea-Roth, Sorin Vidican, Vasile Mureşan (coach), Dan Sălăgean, Liviu Simplăceanu (Source: Vana, 1966-1971).

In the period of their club team training by coach Vasile Mureşan, the following were members of the national junior teams: Gheorghe Oţelac, Viorel Moisin, Radu Vana, Marius Buleu, Gheorghe Roman, Alexandru Vidican, Sorin Vidican, Marius Crăciun, Tudor Ursache, Cornel Voicu, Romeo Ţimbuli. The representative senior team of Romania included Gheorghe Roman, Gheorghe Oţelac, Marius Crăciun, Marineli Banu (Mureşan, 1992).

In the period 1966-1972, Vasile Mureşan was a member of the coaching staff who trained the Romanian national junior teams and led them to several editions of the Balkan Championships and the Friendship Cup. As such, he contributed to the achievement of valuable performance in official international competitions. The Balkan Championships: 3rd place, Izmir, 1966; 4th place, Hunedoara, 1967; 2nd place, Ankara, 1970; 2nd place Izmir, 1971. The Friendship Cup: 2nd place, Bucharest, 1971; 2nd palce, Plovdiv, 1972 (Mureşan, 1992).

For his work and the results obtained by the teams trained by him, the National Council for Physical Education and Sport awarded him the distinctions Merits in Sports and Special Merits in Sports (***, 1960).

Vasile Mureşan's work over several decades demonstrated that in order to use their full potential, the players of a basketball team must have, in addition to talent, work and motivation, group cohesion; they must have a coach who, besides a good selection and training process, educates them in a certain spirit, supports them morally and stimulates them. The 1960's generations of basketball players at the Student Sports School in Cluj had the chance to work with a special man, an accomplished pedagogue and a highly respected coach. The players trained by him learned that in order to obtain sports performance they had to work. During the training hours, as well as outside the sports ground, they were infused with the conviction that without work, without the wish to surpass themselves, they could easily get lost in mediocrity. Vasile Mureşan's team players were characterized by a great work capacity, fair play and tenacity in defending their chances, as well as a team spirit reaching its highest form of manifestation, which generated the feeling that the team was a second family for each player.

Teaching positions

In addition to his coaching activity, Vasile Mureşan fulfilled a number of teaching positions both in pre-university education, as a teacher at High School no. 10, and in higher education, at the Department of Physical Education and Sport of the Polytechnic Institute in Cluj-Napoca. In carrying out specific didactic duties, in addition to teaching he studied, making efforts to acquire knowledge, to gain experience, to acquire and optimize methodical skills ensuring his professional progress. He followed the stages for obtaining his teaching degrees: permanent teacher certification (***, 1964), second degree (***, 1968) and first degree (***, 1980). In his university career, he promoted step by step, becoming an instructor in 1970, assistant professor in 1979, and associate professor in 1992 (***, 1960).

As a university professor, he channeled a large part of his efforts towards the goal of committing to his profession; he had a passion for his work, obtaining good results in teaching and education. The value of his didactic activity, his achievements in research and publication – elaboration of a course, of a methodical guidebook on teaching physical education and sport, participation as a member in research teams for optimization of the design, teaching and evaluation of physical education programs in higher education, publication of 29 works – established him as a good teacher, highly praised by students, and an authority among his colleagues (Mureşan, 1989).

Vasile Mureşan understood as few of our professors did that the work of an educator is largely validated by the professional, ethical and social evolution of his disciples. Trained in this spirit, his team players achieved, in addition to their sports results, professional performance. Their great majority attended university studies, becoming teachers, doctors, engineers, psychologists, lawyers, etc., while others are skilled workmen. All are highly respected citizens in the communities where they live and work.

Vasile Mureșan is a servant of physical education and sport who by his work, results, pedagogical tact, relationships with his collaborators, his prestige and recognition among his students, athletes, colleagues and the entire community has established himself as a model. He is loved, respected and appreciated by his students and players both for their achievements in their common work in physical education classes and sports competitions, and for the lessons of life learned from this special man.

Conclusions

1. During the first years of activity, his ambition and continuous training, his wish to form teams capable of obtaining high performance helped him optimize his work methodology, acquire professional experience, and lay the foundations of future performance obtained by the basketball teams of the Student Sports School in Cluj.

2. In the period 1965-1972 the players trained by Vasile Mureșan won two National Champion titles and two silver medals at the National Junior I Basketball Championships, in 1965 and 1966 they won the National Student Sports School Competition, and in 1965 and 1966 they won the gold medals in the National School Competition.

3. As a member of the coaching staff who trained the Romanian national junior teams in the period 1966-1971, he contributed to the winning of three medals at the Balkan Championships and two medals in the Friendship Competition.

4. In recognition of his professional value and merits in the development of junior men's basketball, following the proposal of the Romanian Basketball Federation, he was awarded the distinctions Merits in Sports and Special Merits in Sports.

5. Through his valuable expertise, he contributed to the training of several generations of students at High School no. 10 in Cluj-Napoca. As a professor at the Polytechnic Institute, he channeled his efforts towards committing to his profession; he had a passion for his work, obtaining good results in teaching and education.

6. For all these reasons, professor and coach Vasile Mureșan is loved, respected and appreciated by his students and players, both for their common achievements in physical education classes and sports competitions, and for the lessons of life learned from this special man.

Conflicts of interest

Nothing to declare.

Acknowledgements

Through this approach, we aimed to make known to present generations the activity and results of coach and Professor Vasile Mureșan, to pay him homage on behalf of the generations of basketball players and students trained under his guidance.

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Palestrica of the third millennium – Civilization and Sport
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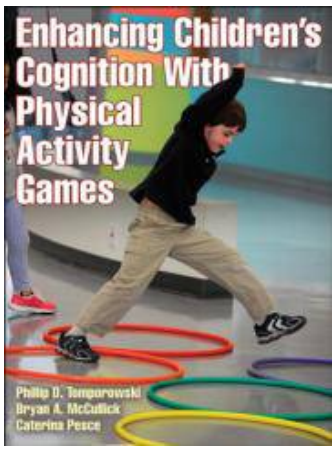
Enhancing children's cognition with physical activity games
(Îmbunătăţirea cogniţiei copiilor prin jocuri fizice)
Autori: Phillip Tomporowski, Bryan McCullick, Caterina Pesce
Editura: Human Kinetics, 2015
256 pagini; Preţ: £29,99 (tipărită), £14,16 (eBook - pdf)



A spune că efortul fizic are efecte benefice asupra sănătăţii, la toate vârstele, şi asupra dezvoltării somatice a copiilor şi adolescenţilor, este de multă vreme un lucru comun, un adevăr acceptat ca având valabilitate maximă, inclusiv de către cei cărora nu le place sportul şi/sau îl refuză în mod sistematic, mai mult sau mai puţin motivat. Că exerciţiul fizic are un semnificativ impact pozitiv şi asupra funcţiilor creierului, în general, şi asupra funcţiilor cognitive, în special, reprezintă însă un adevăr mai recent evidenţiat, mult mai puţin cunoscut şi, pe cale de consecinţă, un argument la care, din păcate, apelează prea rar chiar şi cei care pledează insistent pentru sport, şi care văd în acesta un tip de activitate ce nu trebuie să lipsească, cu nici un chip, din „agenda" diurnă a oricui, şi mai cu seamă a copiilor. Această diiscrepanţă între atenţia şi interesul de care se bucură cele două categorii de efecte, deşi explicabilă, este indubitabil nu doar nedreaptă, ci şi păguboasă, din perspectiva formării şi educării noilor generaţii, motiv pentru care orice material şi argument care analizează, explică şi arată cum, prin ce mijloace concrete, poate fi generat acest impact favorabil al exerciţiului fizic asupra cogniţiei copiilor, trebuie imediat salutat şi intens promovat. Ceea ce vom încerca să facem şi noi în cele ce urmează, vis-a-vis de lucrarea selectată pentru recenzia de faţă.

Dacă ar trebui să ne rezumăm la doar câteva rânduri de atenţionare, ar fi suficient să preluăm descrierea fugitivă (short description) afişată pe site-ul editurii. Unde se spune că această carte *„te ajută să creezi experienţe de învăţare, bazate pe mişcare, care dezvoltă corpul şi mintea copiilor cu vârste cuprinse între 3 şi 12 ani, învăţându-te cum să concepi activităţi fizice care să vizeze dezvoltarea cognitivă şi îmbunătăţirea performanţelor şcolare ale copiilor respectivi"*. Întrucât, din fericire, spaţiul tipografic pus la dispoziţia rubricii noastre, nu ne constrânge totuşi la prezentări atât de concentrate - simple enunţuri de natură pur publicitară, de fapt, care urmăresc doar să capteze atenţia potenţialilor cumpărători, fără a le spune însă mai multe, în ideea de a-i ajuta să decidă achiziţionarea lucrării în deplină cunoştinţă de cauză -, în cele ce urmează vom arăta şi cum, practic prin ce metodologie, şi cu ajutorul căror informaţii şi exemplificări, cei cărora li se adresează cartea vor putea atinge obiective atât de promiţătoare, cum sunt cele enumerate mai sus.

În condiţiile în care există o pletoră de lucrări, care ne ajută să utilizăm, sau să creăm, jocuri prin care se dezvoltă prioritar deprinderile fizice, aceasta ar fi prima carte care ne arată cum să concepem jocuri fizice care să vizeze în mod specific îmbunătăţirea abilităţilor cognitive ale copiilor. Iar întrucât este scrisă de trei autorităţi în domeniul formării educatorilor, al fiziologiei exerciţiului fizic şi al ştiinţelor sportului, ea ne arată cum trebuie folosite conceptele moderne referitoare la dezvoltarea copiilor, la ştiinţele cognitive, la educaţia fizică şi la educarea educatorilor, pentru a crea experienţe de învăţare bazate pe mişcare, în aşa fel încât copiii să beneficieze atât în planul dezvoltării somato-motorii cât şi în cel al dezvoltării mentale. Asta ne asigură că, parcurgând aprofundat şi aplicat textul cărţii, profesioniştii ce lucrează cu asemenea vârste vor fi eficient ghidaţi în crearea acelui tip de ambianţe care vor favoriza dezvoltarea cognitivă şi vor genera îmbunătăţiri semnificative ale performanţelor intelectuale; concret ale rezultatelor şcolare. Mai mult însă, dat fiind că simpla ofertă de recomandări şi reţete îndeamnă la un comportament aplicativ mecanicist, lipsit de preocuparea şi de capacitatea de a adapta în mod adecvat, creativ cunoştinţele la situaţii şi populaţii specifice, autorii şi-au propus, şi au reuşit, să ofere un material care să-i ajute pe respectivii profesionişti nu doar să conceapă asemenea jocuri, ci şi să-i facă să înţeleagă ***de ce*** aceste jocuri, şi numai ele, pot conduce la rezultatele dorite şi aşteptate; rezultate care să merite investiţia de timp şi imaginaţie necesare structurării şi perfecţionării jocurilor în cauză, respectiv investiţia de timp, energie şi speranţă, în aplicarea lor la copiii avuţi în grijă.

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Înainte de a prezenta structura propriu-zisă a cărţii, mai precizăm că atât mostrele de jocuri, de preluat ca atare, cât şi ghidurile şi îndrumările privind tehnica creării de jocuri noi, originale, au în vedere cele două subcategorii de vârste, identificabile în plaja de vârste avută în vedere, cuprinse între 3 şi 12 ani; copiii de 3-7 ani, respectiv cei de 7-12 ani. Pe de altă parte, dată fiind utilitatea lui efectivă, demn de menţionat este şi glosarul cu care lucrarea este prevăzută, glosar absolut necesar într-o situaţie ca aceasta, în care precizia maximă privind înţelesul şi semnificaţia termenilor reprezintă o condiţie *sine qua non.* Cu atât mai mult cu cât autorii au în vedere nu doar prezentul domeniului jocurilor fizice, ei referindu-se şi la aspecte ce ţin de modelele învăţării în secolul XXI, în general. Modele în care, din foarte multe şi bine documentate considerente, jocurile fizice vor trebui să aibă un rol clar definit şi deloc minor, pentru a se putea spera cu îndreptăţire că generaţiile ce vin vor beneficia de o educaţie comprehensivă în adevăratul înţeles al conceptului.

Materialul este prezentat în trei părţi, prima dintre ele având rolul de a-l familiariza pe cititor cu rezultatele cercetărilor şi dovezile ştiinţifice care explică modul în care activitatea fizică influenţează în bine dezvoltarea mentală a copiilor. Mai pe larg spus, în această parte de început, după prezentarea problemelor generale ale devoltării mentale a copiilor (cap. 1) se vorbeşte despre beneficiile dovedite ale activităţii fizice, în planul cognitiv şi în cel al rezultatelor şcolare (cap. 2), despre mecanismele prin care jocurile de mişcare îi ajută pe copii să gândească şi să înveţe (cap. 3), precum şi despre felul în care, prin aceste jocuri, poate fi creată şi menţinută acea ambianţă motivaţională ideală, în care copiii ajung să vrea efectiv, să-şi dorească ei să înveţe (cap. 4). Iar dat fiind că, după cum o arată şi titlul său, funcţiile cognitive reprezintă elementul central al cărţii, precum şi ca urmare a faptului că editura oferă acces liber la textul în cauză – http://www.humankinetics.com/excerpts/excerpts/how-physical-activity-and-exercise-enhance-childrens-cognition - atragem şi noi atenţia asupra subcapitolului intitulat *„Cum îmbunătăţesc exerciţiile fizice cogniţia copiilor ?*", din cel de-al doilea capitol. Este vorba de o secvenţă esenţială a cărţii, care deşi mai greu accesibilă - întrucât face apel la cunoştinţe privind structura şi fiziologia intimă a creierului - se impune a fi parcursă cu toată atenţia, fiindcă ea ne aduce informaţii din categoria celor rar incluse în cărţile dedicate practicienilor din domeniul activităţilor fizice şi sportului, dar şi pentru că tocmai acest tip de informaţii probează irefutabil că beneficiile de care am amintit nu sunt simple găselniţe, fără suport ştiinţific, ale adepţilor sportului, ci fenomene cât se poate de reale, clar probate de către neuroştiinţă. Astfel, din păcate abia în ultimele două decenii, s-a putut demonstra că activitatea fizică poate produce modificări la nivelul anumitor structuri ale creierului (cerebel, cortexul motor, cortexul prefrontal şi hipocampus), pentru ca în continuare, aceste modificări să influenţeze favorabil gândirea şi comportamentul copiilor.

Următoarele 5 capitole alcătuiesc partea a II-a, care are drept obiectiv să-i înveţe pe practicieni să transleze, să facă trecerea de la teorie la practică. Parcurgând capitolele respective, aceşti practicieni vor înţelege felul în care mişcările creează adevărate hărţi mentale (cap. 5) şi vor fi sfătuiţi şi ghidaţi cum să facă să-i angreneze pe copii în învăţarea prin joc (cap. 6). Ce calităţi şi cunoştinţe speciale trebuie să-i caracterizeze pe profesorii care-şi propun să îmbunătăţească performanţele cognitive şi şcolare ale copiilor, cu ajutorul acestor jocuri, aflăm din cap. 7, iar cum trebuie evaluaţi copiii în acest gen de activităţi, din cap. 8. Ultima secvenţă a părţii secunde abordează problematica integrării jocurilor de mişcare în formarea/educarea generaţiilor acestui prim secol al celui de-al III-lea mileniu; altfel spus, cum pot şi trebuie să fie ele incluse în programa şcolară, în activităţile de timp liber de acasă, şi în programele special concepute şi oferite copiilor de către comunitate.

Partea a III-a are doar două capitole şi conţine numeroase mostre de jocuri, pentru copiii de grădiniţă (cap. 10), respectiv pentru cei din primii ani de şcoală (cap.11). Conţinutul diferă, desigur, dar structura celor două capitole este identică, întrucât după jocurile din primul subcapitol, care „pun la încercare" funcţiile executive ale copiilor, urmează „grosul" jocurilor, împărţite însă în funcţie de principiile ce stau la baza structurării lor; jocuri care au în vedere în primul rând interferenţa contextuală, jocuri ce plasează accentul pe controlul mental şi jocuri care-i pun pe cei care le practică în situaţia de a descoperi lucruri şi fenomene noi.

În încheiere, înainte de a reţine câteva lucruri despre cei care au făcut posibilă apariţia acestei binevenite lucrări, remarcăm faptul că, spre deosebire de cum se întâmplă lucrurile de regulă în cazul cărţilor cu mai mulţi contributori - când la redactarea unui capitol sau altul colaborează de obicei doar o parte dintre ei - de data aceasta, fără nici o excepţie, fiecare capitol este scris/semnat/asumat împreună de către cei trei autori. Toţi, personalităţi ştiinţifice cu suficientă expertiză încât să se califice pentru a-şi exprima punctul de vedere în problematicile abordate de lucrare. Astfel, Tomporowski, profesor de kinesiologie la Universitatea din Georgia (SUA), este un psiholog experimentalist de marcă, implicat de patru decenii în studiul învăţării şi al efectelor exerciţiului fizic asupra funcţiilor creierului, în timp ce Caterina Pesce, profesor al Universităţii de Sport şi Mişcare din Roma, dublu licenţiată - în ştiinţele sportului şi în psihologie experimentală - şi-a focalizat cercetările exact pe impactul benefic al activităţii fizice asupra cogniţiei copiilor. Bryan McCullick, de la aceeaşi universitate ca Tomporowski, profesor de educaţie fizică la bază, dar din 1997 educator/formator de profesori de educaţie fizică, vine să întregească în mod fericit această redutabilă şi prolifică echipă de autori.

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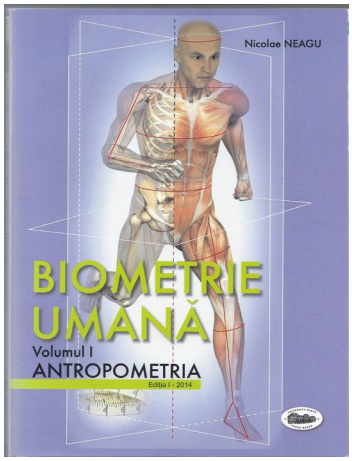
Human biometry, Vol. I - Anthropometry
(Biometrie umană, Vol. I – Antropometria)
Author: Nicolae Neagu
University Press Publishing House, Târgu-Mureş, Romania, 2014
Academic format (18/25 cm), 262 pp.



A reference treatise on anthropology and biomedicine

The book of our distinguished colleague is in fact a monumental treatise – designed to include 3 (three) volumes – with a multi- and interdisciplinary view, which integrates anthropology, biomedicine, functional and movement anatomy, kinesitherapy, sanogenesis, physical education and sport.

In volume I, *Human biometry* deals with *Anthropometry*, integrated and focused on physical (biological) anthropology. Volume I is already a scientific success in biomedicine, artistic anatomy and sports medicine. It comprises 262 pages; it is structured in a preface and 6 chapters with 30 subchapters, 7 tables and 270 figures, 1 addendum, exhaustive and up-to-date bibliography: 72 titles of treatises, encyclopedias, journal articles, web sites.

The first edition was published by the *University Press* Publishing House, University of Medicine and Pharmacy Târgu Mureş, © Copyright 2014.

In the *Preface*, the author shows that human biometry is a real developing field, with multiple interconnections in human corporeality, anthropomorphism, somatic variability and morphofunctionality of the human system.

Chapter I reveals *anthropology as a human study science:* concepts and paradigms; historical synthesis, theories and trends; Quaternary and Anthropocene humans; human phylogenesis - anthropogenesis; the place of humans in the animal kingdom; main research directions and branches of anthropology; bio-anthropological variability.

Chapter II presents the *evolution of anthropometry:* anthropometry as a sub-branch of biological anthropology; a short history and topological anthropometry (human constitutional homotype).

Chapter III synthesizes concepts of *posturology*: posturology – the concept and a short history; posture, balance and movement; postural control and the intrinsic oscillation cone; the standing position and human bipedalism; body and segment positions; fundamental positions and their derivatives used in anthropometry.

Chapter IV characterizes *measurements in anthropometry:* landmarks (classification, designations, explanations); references and anthropometric measurements (planes, regions, dimensions).

Chapter V deals with *applied anthropometry*: functions and areas of applicability; categories of measurements; lengths, diameters, circumferences of the body and limbs; gamma-, flexo-, dynamo- and gravimetry; barometry and the center of gravity of the body; adipometry.

Chapter VI elaborates on *qualitative analytical anthropometry:* concepts (introspective, diagnostic and predictive functions); stages of analytical anthropometry; indicators and variables; deontology of anthropometric assessment; body-segment relations/proportions; human constitutional morphotypes; equipment used in anthropometry.

The addendum presents anthropometric measurement tools.

Bibliography is substantial, updated and highly diverse.

Human biometry is a theoretical treatise that is symbiotically linked to the practical-application field of static-dynamic, morphological-functional, posture-movement complementarity. Through normality, the norm in relation to sanogenesis, health and performance is set. Through deviation from normality, dysfunctional and pathological conditions occur.

It is absolutely obvious that the *fields of application of human biometry – anthropometry* overlap life sciences, many medical specialties and life itself: medical, sports, evolutionary, racial, sexual, artistic, social, occupational, industrial, military, aeronautical anthropometry.

Morphotypes (somatotypes, biomorphotypes) - Chapter 6.6. reveals the truth that human beings – in their individual variability – are the result of intrinsic-extrinsic interactions, which model in a factorial manner the shape and structure of the body and the functions of the body systems. Hereditary determinism (*constitutional genotype*) is "adapted" through environmental causality (*constitutional phenotype*). In terms of taxonomies of human constitutional morphotypes, the following *classifications* are presented comparatively: *Sigaud, Kretschmer, Pende, Sheldon, Martiny*. Essentially, a biometric - anthropometric approach to etiology ® pathogeny, in a cause ® effect relationship is established: each biomorphotype shows certain *particular pathological predispositions and vulnerabilities* (Millon, 2004). This approach outlines in its turn prevention-prophylaxis, therapeutic-curative, rehabilitation-recovery strategies.

This is why an exceptional merit of the book is that it defines a multifactorial normality system at biometric – anthropometric level, in terms of magnitudes, weights, proportions, ratios, typologies, such as mobility, motricity, movement, physical effort, as an anatomical ideal - motor, functional, artistic, esthetic.

The value of this book also appears in the context of the global population situation, in which over 1 billion people are malnourished, and more than 1.5 billion are overweight (obese). This means that the *human biometric standard, within the limits of normality and health,* is severely altered in more than 2.5 billion people, with detrimental consequences on human pathology and a reduction of the mean survival time and life expectancy.

This is why our review is necessary and its publication in the *Palestrica of the Third Millennium – Civilization and Sport* journal is mandatory.

The book *Human biometry,* vol. I *Anthropometry* by Prof. Dr. Nicolae Neagu – head of the Department of Motricity Sciences at the University of Medicine and Pharmacy Târgu Mureş, is a national first. It has a particular scientific value and is extremely necessary in medicine, biology, anthropology, physical education and sport, in etiopathogenic and prophylactic intervention – therapy – rehabilitation.

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File din istoria poloului orădean.
Echipe în prima divizie a țării 1947-2014
(Pages of history of Oradea water polo.
Romanian first division teams 1947-2014)
Authors: Ştefan Maroti, Mihaela Goina
University of Oradea Publishing House, 2015
No. of pages: 251, No. of illustrations: 41

Not long ago, the publication of a new sports history book was brought to the attention of our editorial office: *File din istoria poloului orădean. Echipe* în *prima divizie a* țării *1947-2014 (Pages of history of Oradea water polo. Romanian first division teams 1947-2014)*. We consider that this area of physical education and sport has become richer through the publication of this book, which adds to our knowledge about the past of the water polo game in the city of Oradea. The authors of the book are Ștefan Maroti, who authored and co-authored several books and many articles on the sports history of Bihor area, and Mihaela Ana Goina, who is also known as the author of a number of articles on Bihor sports history.

It is known that Oradea can take pride in the evolution of sport in this region of the country, in the results of its athletes who, during the course of time, have achieved performance that has lived up to the reputation of the city and have made it visible at national and international level. Among sports in which special results have been achieved, water polo stands out. Of all team sports games, in more than one hundred years that it has been played in Oradea, water polo has obtained the best results in national and international competitions, many players being promoted to the Olympic and national senior and junior teams. Despite this glorious past, curiously but true, no book on the history of Oradea water polo has so far been published, and there are few studies addressing different aspects related to the history of this sport representative of Oradea.

Viewed from this perspective, as well as in terms of quality of their achievement, the authors' approach is a praiseworthy initiative, through which they have traced in the pages of this book the history of almost seven decades of participation of Oradea teams in the most prestigious domestic water polo competition, the National Championships.

Connoisseurs know that to write such a book is not easy at all and that such an approach requires extensive knowledge of the field, thorough documentation, a lot of experience, perseverance and creativity. Given the long time period that it spans, the richness of facts and events, the multitude of results and the great number of participants, this is a bold and at the same time difficult, but topical and useful approach.

A praiseworthy initiative, an approach to admire due to the special efforts made for laborious documentation from the most diverse sources (archive documents, articles on water polo from sports newspaper pages, sports columns of local daily papers, photographs kept in albums, documents of sports organizations, statistics, records of participants or supporters, etc.). As the authors state in the introduction, one of the motives that guided them was to uncover as much information as possible, so that it would not be lost in oblivion, which would be sad and undesirable.

The richness of data and the long time period to which they refer make impossible their condensation in the available space, which is why we propose to review the table of contents, whose chapters synthesize through their titles the content of the book: The first years of participation in the National Championships; Results leading to the visibility of Oradea water polo at national level; Crișul Oradea, continuing to be among the top teams of Division A Championships; Difficult years for Oradea water polo; Crișul Oradea in the second value group of Romanian water polo; Back to the first division; Oradea water polo in obvious progress; A dream coming true, Crișul Oradea, a national champion; Medal winning years in the domestic championships for Oradea water polo; A difficult transition period; Years of building a competitive team; The period

of national dominance of the Oradea team. At the end of the volume, the authors trace through photo images the history of the Oradea water polo teams having played in the first division. In this way, the book allows the reader to learn about this wonderful world of water polo in Oradea, opening a comprehensive view and offering a useful tool that meets the requirements of specialists as well as those of lovers of this sport, who wish to keep informed. The book is one of the few in the Romanian literature that succeeds in presenting a history segment of a sport in an almost exhaustive manner.

The presentation of a book can refer to many aspects. Even if our approach was not an extensive one, we believe that we provided enough arguments to arouse the interest of potential readers.

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Cum să ne menţinem sănătoşi, indiferent de vârstă
(How to stay healthy, regardless of age)
Author: Liana Monica Deac
Ecou Transilvan Publishing House, April 2016
271 pages

Doctor Liana Monica Deac is an Associate Professor at the Faculty of Biology and Geology of UBB Cluj. She has many papers published in Romania and abroad, she has attended training courses, she is a member of 11 professional associations, she has published 7 medical books and a course of Microbiology for students, and she has participated with papers as an invited speaker in a number of congresses.

This is a remarkable book because it refers to the entire spectrum of health issues. As a researcher in the field of stress, I was pleasantly impressed by the way in which the author summarized in only 6 pages the problems of the complex relations between stress and health. The book is structured in the following 12 chapters: Definirea noţiunii de sănătate (Definition of the concept of health), Comportamentele cu risc (Risk behaviors), Alimentaţia, nutriţia şi dieta (Food, nutrition and diet), Comportamentul sexual normal şi pathologic (Normal and pathological sexual behavior), Rolul activităţii fizice în menţinerea sănătăţii noastre (The role of physical exercise in the maintenance of our health), Locuinţa, ca factor de menţinere a sănătăţii (The living place as a health maintenance factor), Vestimentaţia şi igiena individuală (Clothing and individual hygiene), Somnul ca efect asupra sănătăţii (The effect of sleep on health), Gândirea pozitivă şi viaţa sănătoasă (Positive thinking and a healthy lifestyle), Familia sănătoasă (A healthy family), Educaţia pentru sănătate (Health education), Asigurarea cu servicii de sănătate (Health care service provision).

Here I reproduce the conclusions of the book (edited on the last cover). "Health is an ideal, as well as a fundamental requirement of life; consequently, it is a concern for each of us as it has an individual nature. All health dimensions are influenced by several factors that can be grouped into health care system factors, environmental factors, genetic factors and lifestyle factors, which interact in the maintenance of the population's health".

I congratulate the author on this book and I wish her new professional achievements materializing in new volumes.

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SCIENTIFIC MEETINGS
MANIFESTĂRI ŞTIINŢIFICE

MINISTERUL EDUCAȚIEI ȘI CERCETĂRII ȘTIINȚIFICE
INSPECTORATUL ȘCOLAR JUDEȚEAN CLUJ

Adapted physical activities as a tool for social inclusion
Activitățile fizice adaptate ca instrument de incluziune socială

On Friday 15 April 2016, the Romanian Medical Society of Physical Education and Sport in partnership with the Cluj County School Inspectorate organized a workshop on *Adapted physical activities as a tool for social inclusion* in Gilău, Cluj county.

The aim of the workshop was the social inclusion of disabled pupils integrated in the mass education system, who need an individualized approach by the teaching staff.

The organizer of the workshop was the Cluj County School Inspectorate, School Inspector Prof. Drd. Cristian Potora for physical education and sport, and School Inspector Prof. Laura Ionescu for special education.

The invited speakers on this topic were: Assoc. Prof. Dr. Viorel Lupu, "Iuliu Haţieganu" UMPh Cluj-Napoca, psychiatrist, Dr. Ramona Lupu, speech therapist, Prof. Dr. Vasile Bogdan, Dean of the Faculty of Physical Education and Sport of UBB Cluj-Napoca. The SMREFS was represented by Professor Dr. Simona Tache and Prof. Dr. Traian Bocu, Vice-President and Editor-in-Chief of the "Palestrica of the Third Millennium – civilization and sport" journal.

A great number of pre-university education teachers participated in the workshop proceedings.

The following presentations were delivered in the plenary session:

1. Social inclusion and the characteristics of an inclusive environment – School Inspector Prof. Laura Ionescu, Cluj County School Inspectorate.
2. Methodological guidelines in designing inclusive physical activities – School Inspector Prof. Drd. Cristian Potora, Cluj County School Inspectorate.
3. Children with special educational needs also have the right to be educated – Dr. Ramona Lupu, PhD psychologist, speech therapist, CJRAE Cluj – "Iuliu Haţieganu" School, and Assoc. Prof. Dr. Viorel Lupu, MD PhD, Department of Neuroscience, Discipline of Psychiatry and Pediatric Psychiatry, "Iuliu Haţieganu" UMPh Cluj-Napoca, Romania.

Children with special educational needs (SEN) have the right and must be educated like all the other children. Teachers need help and support in order to optimally educate children with and without SEN. Regarding the particularities of each disorder that a child with SEN integrated in the mass education system may present, a close collaboration between the child's parents and treating doctor is required in order to establish the amount of effort that the child can make. Thus, although in the majority of the disorders movement is recommended, in some situations certain precautions must be taken.

4. Adapted physical activities as a tool for social inclusion – Maniu Dragoș Adrian – Babeș-Bolyai University Cluj-Napoca, Faculty of Physical Education and Sport, Department of Theoretical Disciplines and Physical Therapy; Maniu Emese Agnes - Special School for Visually Impaired Children, Cluj-Napoca.

The presentations were followed by discussions.

* * *

Vineri 15 aprilie 2016, Societatea Medicală Română de Educaţie Fizică si Sport în parteneriat cu Inspectoratul Şcolar Judeţean Cluj a organizat în localitatea Gilău judeţul Cluj, workshopul cu tema *Activităţile fizice adaptate ca instrument de incluziune socială*.

Scopul workshopului a fost incluziunea socială a elevilor cu dizabilităţi, care sunt cuprinşi în reţeaua de masă şi care au nevoie de tratare individualizată din partea cadrelor didactice.

Organizatorul workshopului a fost Inspectoratul Şcolar Judeţean Cluj-Napoca, inspector şcolar Prof. Drd. Cristian Potora pentru educaţie fizică şi sport şi inspector şcolar Prof. Laura Ionescu pentru învăţământul special.

Invitaţi pentru a conferenţia pe această temă au fost: Conf. Dr. Viorel Lupu, UMF Iuliu Haţieganu Cluj-Napoca, medic psihiatru, Dr. Ramona Lupu, logoped, Prof. Dr. Vasile Bogdan, Decanul Facultăţii de Educaţie Fizică şi Sport din cadrul UBB Cluj-Napoca. Din partea SMREFS, Profesor Dr. Simona Tache şi Prof. Dr. Traian Bocu, vicepreşedinte şi redactor şef al revistei Palestrica mileniului III - civilizaţie şi sport.

Au participat numeroşi profesori din învăţământul preuniversitar.

Prezentări în plen au avut următorii:

1. Incluziunea socială şi caracteristicile mediului incluziv – Inspector şcolar Prof. Laura Ionescu, ISJ

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2. Repere metodice în proiectarea activităţilor fizice incluzive – Inspector şcolar Prof. Drd. Cristian Potora, ISJ

3. Şi copiii cu CES sunt educabili - Psih. Dr. Ramona Lupu, profesor logoped, CJRAE Cluj - Şcoala ”Iuliu Haţieganu” şi Conf. Dr. Viorel Lupu, Departamentul de Neuroştiinţe, Disciplina de Psihiatrie şi Psihiatrie pediatrică, UMF Iuliu Haţieganu Cluj-Napoca, Romania.

Copiii cu cerinţe educaţionale speciale (CES) au dreptul şi trebuie să fie educaţi ca şi ceilalţi copii. Desigur că şi cadrele didactice au nevoie de sprijin pentru a putea forma cât mai bine atât copiii fără CES cât şi pe cei cu CES. În ceea ce priveşte particularităţile fiecărei tulburări de care poate suferi un copil cu CES integrat în învăţământul de masă, este nevoie să fie o colaborare strânsă între părinţii copilului şi medicul curant al acestuia, care poate specifica modul şi gradul de efort pe care copilul îl poate depune. Astfel că, deşi în majoritatea tulburărilor mişcarea este recomandată, în unele situaţii aceasta impune anumite precauţii.

4. Activităţile fizice adaptate ca instrument de incluziune socială – Maniu Dragos Adrian - Universitatea Babeş-Bolyai Cluj-Napoca, Facultatea de Educaţie Fizică şi Sport, Departamentul de Discipline Teoretice şi Kinetoterapie; Maniu Emese Agnes - Şcoala specială pentru copii cu deficienţe de vedere

Prezentările au fost urmate de discuţii.

Cristian Potora, Laura Ionescu
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School Inspector Cristian Potora introducing the guests: School Inspector Prof. Laura Ionescu, Prof. Dr. Traian Bocu, Prof. Dr. Simona Tache, Prof. Dr. Vasile Bogdan, Assoc. Prof. Dr. Viorel Lupu.

School Inspectors Cristian Potora and Laura Ionescu, alongside the invited speakers, Assoc. Prof. Dr. Viorel Lupu and Dr. Ramona Lupu, speech therapist.

Teachers participating in the workshop proceedings.

Aspects during the workshop proceedings.

Prof. Maniu Emeşe during her presentation.

Group picture at the end of the workshop proceedings.

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EVENTS
EVENIMENTE

MINISTERUL EDUCAȚIEI ȘI CERCETĂRII ȘTIINȚIFICE
INSPECTORATUL ȘCOLAR JUDEȚEAN CLUJ

The 2016 spring school sports list of prize winners
Palmaresul sportiv şcolar de primăvară, 2016

The series of sports and scientific events in which the Romanian Medical Society of Physical Education and Sport has decided to get involved in partnership with the Cluj County School Inspectorate includes the events that will be briefly presented in the following lines. The aim of this involvement is to stimulate the participation of a great number of pupils from rural and urban areas in physical activities that are important for prevention in health care, health promotion and lifelong maintenance of health in the population.

* * *

Din suita evenimentelor sportive şi ştiinţifice în care Societatea Medicală Română de Educaţie Fizică şi Sport, a hotărât să se implice, în parteneriat cu Inspectoratul Şcolar Judeţean Cluj, fac parte şi cele pe care le vom prezenta pe scurt în randurile următoare. Scopul acestor implicări este stimularea angrenării unui număr cât mai mare de elevi din mediile rural şi urban, în activităţile fizice importante pentru prevenţia în sănătate, promovarea sănătăţii şi menţinerea stării de sănătate în populaţie, pe durata vieţii.

Athletics tetrathlon competitions for middle schools in Borşa (1)

Concursuri de atletism-tetratlon pentru Gimnaziu, la Borşa (1)

On Saturday 9 April 2016, in Borşa commune, Cluj county, the first edition of a school athletics competition for middle schools took place, which was organized in the form of combined events (50 m sprint, running long jump, rounders ball throw, tug of war by teams). The following 10 communes participated in the competition: Cămărașu, Bonţida, Mociu, Panticeu, Apahida, Borşa (the organizing commune), Aşchileu Mare, Vultureni, Dăbâca, and Răscruci. The competition took place on the new stadium of the Borşa commune, built with European funds, thanks to the Mayor Maria Secară. European funds were also used for the achievement of other objectives of local interest, such as the construction of the two community centers (a large one and a small one), which will host various, particularly cultural events, the renovation of the general school, the foundation of an after school care center, the construction of side roads for the transport of children to school.

* * *

În ziua de sâmbătă 9 aprilie 2016, în comuna Borşa judeţul Cluj, s-a desfăşurat prima ediţie a unei competiţii şcolare de atletism, pentru şcolile gimnaziale, organizată sub formă de probe combinate (alergare pe distanţa de 50 m, săritura în lungime cu elan, aruncarea mingii de oină, trasul frânghiei pe echipe). La competiţie au participat următoarele 10 comune: Cămărașu, Bonţida, Mociu, Panticeu, Apahida, Borşa (comuna organizatoare), Aşchileu Mare, Vultureni, Dăbâca, Răscruci. Competiţia s-a desfăşurat pe noul stadion al comunei Borşa, realizat din fonduri europene, prin grija Primarului Maria Secară. Din fonduri europene au mai fost realizate şi alte obiective de interes comunal cum ar fi cele două cămine culturale (unul mare şi unul mic), care vor servi organizării unor evenimente polivalente, dar în special cu caracter cultural, renovarea şcolii generale, înfiinţarea unui centru de asistenţă after school, construirea unor drumuri laterale necesare pentru transportarea copiilor la şcoală.

Results: Borşa -Tetrathlon 1st edition - 9 April 2016
(50 m sprint, running long jump, rounders ball throw, tug of war - teams)

Place	Girls 11-12 years	Boys 11-12 years	Girls 13-14 years	Boys 13-14 years
	50 m sprint			
1	Corici Ana-Apahida	Sănuţă Ionuţ-Bonţida	Cheţan Daniela-Borşa	Morar Alexandru-Bonţida
2	Balas Andrada-Răscruci	Mocian Marian-Cămărașu	Cioca Susana-Cămărașu	Crăciun Ştefan-Panticeu
3	Coăcean Pop Samira-Răscruci	Hrişcă David-Panticeu	Giloan Loredana-Aşchileu	Dascăl Alexandru-Panticeu
	Long jump			
1	Mândruşcă Amanda-Cămărașu	Bănuţă Ioonuţ-Bonţida	Cioca Susana-Cămărașu	Gliga Laurenţiu-Mociu
2	Mureşan Antonia-Cămărașu	Hrişcă David-Panticeu	Ciocan Dacia-Panticeu	Morar Alexandru-Bonţida
3	Chirilă Alexandra-Borşa	Mocian Marian-Cămărașu	Crăciun Anamaria-Panticeu	Crăciun Ştefan-Panticeu
	Rounders ball throw			
1	Felecan Andreea-Aşchileu	Hrişcă David-Panticeu	Szakacs Denisa-Dăbâca	Dascăl Alexandru-Panticeu
2	Kolbasz Casiana-Bonţida	Mocian Marian-Cămărașu	Horvath Sorina-Cămărașu	Morar Alexandru-Bonţida
3	Boancă Denisa-Vultureni	Cicru Cătălin-Borşa	Ciocia Susana-Cămărașu	Pop Iosif-Cămărașu

Place	Tug of war	General ranking
1	Cămărașu	General School, Cămărașu
2	Borşa	General School, Bonţida
3	Aşchileu	General School, Mociu

Physical education teacher: Prof. Nicolae Pop; Director: Prof. Paul Ciprian Varga; Mayor: Maria Secară

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The technical staff of the Cluj County School Inspectorate – School Inspector Laura Ionescu and School Inspector Cristian Potora, joined by Prof. Dr. Gheorghe Monea.

The Mayor of the Borşa commune, Maria Secară, speaking to the participants.

Preparation of the cups and awards: The Mayor of the Borşa commune, Maria Secară, and School Inspector Cristian Potora.

Start of the sprint event.

The tug of war event.

Winner of the 1st place – Cămărașu School. Physical education teacher: Ovidiu Chira and Director: Prof. Felician Ştefan Prunean-Bogoşi.

Prize award ceremony by Mayor Maria Secară.

Teachers on the podium: I-Cămărașu School, II-Bonţida School, III-Mociu School.

Teacher Ovidiu Chira and the Cămărașu team.

The Annual County School Cup in Athletics (3)

Cupa anuală a Inspectoratului Şcolar Judeţean la atletism (3)

Founded three years ago, the annual competition entitled the Annual County School Cup in Athletics, held on 21 April 2016, gathered this year 300 participants from rural and urban areas, as many as in the previous years. The 200-600 m endurance running events took place on the Cluj Arena Stadium. We mention that the competition had two stages, with points accumulation, the endurance events being decisive. The distribution of competitors by age, gender and rural-urban environment was as follows: RURAL: Grades III-IV 56 pupils; Grades V-VI 56 pupils; Grades VII-VIII 44 pupils – Total 156 pupils; URBAN: Grades III-IV 40 pupils; Grades V-VI 56 pupils; Grades VII-VIII 48 pupils – Total 144 pupils.

As a novelty this year, in the opening of the athletic events, a demonstrative rounders match was played between the team of the General School of Chiuieşti commune, Cluj county, trained and run by Prof. Mihaela Hango, and the junior team of the Polytechnic Sports Club Cluj.

The general ranking is presented in the tables below.

* * *

Înfiinţată cu trei ani în urmă, competiţia anuală intitulată Cupa anuală a Inspectoratului Şcolar Judeţean la atletism (Annual County School Cup in athletics), desfăşurată în ziua de 21 aprilie 2016, a reunit în acest an un număr total de 300 de participanţi, din mediile rural şi urban, la fel de mare ca şi în anii precedenţi. Competiţia s-a desfăşurat pe stadionul municipal Cluj Arena la probe de rezistenţă între 200-600 m. Menţionăm că întrecerile s-au desfăşurat în două etape, cu acumulare de puncte, întrecerile de rezistenţă fiind şi cele decisive. Repartizarea efectivelor concurenţilor pe categorii de vârstă, gen şi pe mediul rural-urban, a fost următoarea: RURAL: Clasele III -IV 56 elevi; Clasele V -VI 56 elevi; Clasele VII - VIII 44 elevi- Total 156 elevi; URBAN: Clasele III - IV 40 elevi; Clasele V - VI 56 elevi; Clasele VII - VIII 48 elevi- Total 144 elevi.

Ca o noutate, în acest an, în deschiderea întrecerilor atletice, s-a desfăşurat un meci demonstrativ de oină între echipele Şcolii Generale din comuna Chiuieşti judeţul Cluj formată şi condusă de Prof. Mihaela Hango şi echipa de juniori a Clubului Sportiv Politehnica Cluj.

Redăm sub formă de tabele, clasamentul general.

Rural grades III-IV

Place	School	Points stage I	Endurance stage II	Total points
1	”Ion Bujor” Middle School, Petreştii de Jos	730	198	928
2	Primary School, Fizeşu Gherlii	660	161	821
3	Middle School, Frata	660	148	808

Rural grades V-VI

Place	School	Points stage I	Endurance stage II	Total points
1	Middle School, Frata	730	295	1025
2	”Ion Bujor” Middle School, Petreştii de Jos	770	241	1011
3	Middle School, Tureni	590	309	899

Rural grades VII-VIII

Place	School	Points stage I	Endurance stage II	Total points
1	Middle School, Frata	790	198	988
2	Middle School, Răchiţele	800	187	987
3	”Ion Bujor” Middle School, Petreştii de Jos	820	109	929

Urban grades III-IV

Place	School	Points stage I	Endurance stage II	Total points
1	”Avram Iancu” Middle School, Dej	830	286	1116
2	”Octavian Goga” Middle School, Cluj-Napoca	740	238	978
3	”Iuliu Haţieganu” Middle School, Cluj-Napoca	790	127	917

Urban grades V-VI

Place	School	Points stage I	Endurance stage II	Total points
1	”Constantin Brâncuşi” Middle School, Cluj-Napoca	750	326	1076
2	”Ion Bob” Middle School, Cluj-Napoca	790	254	1044
3	”Avram Iancu” Middle School, Dej	820	201	1021

Urban grades VII-VIII

Place	School	Points stage I	Endurance stage II	Total points
1	”Nicolae Titulescu” Middle School, Cluj-Napoca	950	110	1060
2	”Ioan Opriş” Middle School, Turda	860	163	1023
3	”Constantin Brâncuşi” Middle School, Cluj-Napoca	850	145	995

In what follows, we present images of the demonstrative rounders match played between the Polytechnic Sports Club Cluj and Izvorul Chiuieşti, as well as of the athletics competition on the Cluj Arena Stadium.

Sports competitions in Cămărașu (5)
Întrecerile sportive de la Cămărașu (5)

The 5th edition of the sports competition in Cămărașu was scheduled as part of the Cluj county educational activities calendar on 7 May 2016, and was held under optimal conditions, through the educational project entitled ”Sports competitions in Cămărașu”. The competition program included 4 athletics events: 40 m, 50 m and 60 m sprint; long jump; rounders ball throw; unconventional 100 m, 150 m and 200 m relay; and tug of war by teams. The following 12 localities of Cluj county, most of which neighboring communes, participated: Frata, Mociu, Apahida, Geaca, Palatca, Răscruci, Sânpaul, Buza, Cojocna, Sic, Căşeiu, Cămărașu (the organizing commune). In addition to these, Sărmașu commune of Mureş county was invited as a special guest.

* * *

Aflată la a V-a ediţie, competiţia sportivă de la Cămărașu a fost programată în cadrul Calendarului activităţilor educative judeţene în data de 7 mai 2016 şi s-a desfăşurat în condiţii optime, prin intermediul Proiectului educativ intitulat „Întrecerile sportive de la Cămărașu”. Programul competiţiei a cuprins 4 probe de atletism: alergare pe distanţele de 40

The rounders teams in a group picture. To the right, the Cluj county sports school inspector, next to Prof. Mihaela Hango.

Presentation of the teams before the beginning of the match. Left: the Chiuieşti School team; Right: the Polytechnic Sports Club junior team.

The Chiuieşti School team on the award podium.

Start of a girls endurance race.

The awards are given by General School Inspector of Cluj county Valentin Cuibus (left), Deputy General School Inspector Mariana Pop, and Sports School Inspector Cristian Potora (right).

On the award podium, teachers next to the pupils they have trained. General School Inspector of Cluj county Valentin Cuibus (left), Deputy General School Inspector Mariana Pop (right).

m, 50 m şi 60 m; săritura în lungime, aruncarea mingii de oină, ştafete neclasice pe distanţele de 100 m, 150 m şi 200 m, la care s-a adăugat trasul frînghiei pe echipe. Au participat următoarele 12 localităţi din Judeţul Cluj, în majoritate comune din zona limitrofă: Frata, Mociu, Apahida, Geaca, Palatca, Răscruci, Sânpaul, Buza, Cojocna, Sic, Căşeiu, Cămăraşu (comuna organizatoare). La acestea s-a adăugat ca invitat special, comuna Sărmaşu din judeţul Mureş.

Place	Tug of war	General ranking
1	Frata	Middle School, Cămăraşu
2	Geaca	Middle School, Frata
3	Căşeiu	Middle School, Mociu

Physical education teacher: Ovidiu Chira; Director: Prof. Felician Ştefan Prunean-Bogoşi; Mayor: Marcel Iancu Mocean

Results:
(40 m, 50 m, 60 m sprint, running long jump, rounders ball throw, tug of war - teams)

Place	Girls 9-10 years	Boys 9-10 years	Girls 11-12 years	Boys 11-12 years	Girls 13-14 years	Boys 13-14 years
	40 m sprint		*50 m sprint*		*60 m sprint*	
1	Gaşpar Raluca-Cămăraşu	Cherteş Felician-Apahida	Cocean Pop Samira-Răscruci	Mocian Marian-Cămăraşu	Bucur Beatrice-Frata	Lumperdean Rafael-Sărmaş
2	Szekely Diana-Mociu	Pop Adrian-Răscruci	Leoca Diana-Frata	Pop Damian-Frata	Cioca Susana-Cămăraşu	Gaşpar Cristian-Sărmaş
3	Bândula Adela-Sărmaşu	Herfas Paul-Mociu	Moldovan Didica-Frata	Vereş Cristian-Mociu	Mocian Andrada-Cămăraşu	Căucean Laurenţiu-Frata
Long jump						
1	Szekely Diana-Mociu	Macarie Alehandro-Cămăraşu	Buchei Denisa-Căşeiu	Mocian Marian-Cămăraşu	Cioca Susana-Cămăraşu	Gliga Laurenţiu-Mociu
2	Gaşpar Raluca-Cămăraşu	Cherteş Felician-Apahida	Chereches Andreea-Apahida	Vereş Cristian-Mociu	Bucur Beatrice-Frata	Morariu Simion-Cămăraşu
3	Tămăşan Alicia-Frata	Pop Adrian-Răscruci	Mândruşcă Amanda-Cămăraşu	Pop Damian-Frata	Sipos Margit-Sic	Clujan Lucian-Apahida
Rounders ball throw						
1	Gaşpar Raluca-Cămăraşu	Vlăduţiu Daniel-Sărmaşu	Leoca Diana-Frata	Moldovan Sergiu-Frata	Cioca Susana-Cămăraşu	Lumperdean Rafael-Sărmaş
2	Szekely Diana-Mociu	Cherteş Felician-Apahida	Moldovan Didica-Frata	Mocian Marian-Cămăraşu	Nagy Edina Dorottya-Sic	Gaşpar Cristian-Sărmaş
3	Cioca Miruna-Cămăraşu	Săplăcan Alin-Căşeiu	Chereches Andreea-Apahida	Păşcaş Adrian-Cojocna-Cara	Bucur Ana Maria-Frata	Căucean Laurenţiu-Frata
4x100 mixed relay			*4x150 mixed relay*		*4x200 mixed relay*	
1	Middle School, Frata		Middle School, Cămăraşu		Middle School, Cămăraşu	
2	Middle School, Cămăraşu		”Ştefan Pascu” Technological High School, Apahida		Middle School, Frata	
3	Middle School, Mociu		Middle School, Mociu		”Samuil Micu” Theoretical High School, Sărmaş	

Opening ceremony

Image during the sprint race.

Competitors during the long jump event.

Rounders ball throw

Prize award ceremony. The winners - Cămăraşu School - Prof. Felician Ştefan Prunean-Bogoşi

Opening speech to the participants by the Mayor of Cămăraşu commune, Marcel Iancu Mocean

Cristian Potora, Traian Bocu
cristipotora@gmail.com

FOR THE ATTENTION OF CONTRIBUTORS

The subject of the Journal

The journal has a multidisciplinary nature oriented toward biomedical, health, exercise, social sciences fields, applicable in activities of physical training and sport, so that the dealt subjects and the authors belong to several disciplines in these fields. The main rubrics are: "Original studies" and "Reviews".

Regarding "Reviews" the main subjects that are presented are: oxidative stress in physical effort; mental training; psychoneuroendocrinology of sport effort; physical culture in the practice of the family doctor; extreme sports and risks; emotional determinatives of performance; the recovery of patients with spinal column disorders; stress syndromes and psychosomatics; olympic education, legal aspects of sport; physical effort in the elderly; psychomotricity disorders; high altitude sportive training; fitness; biomechanics of movements; EUROFIT tests and other evaluation methods of physical effort; adverse reactions of physical effort; sport endocrinology; depression in sportsmen/women; classical and genetic drug usage; Olympic Games etc.

Among articles devoted to original studies and researches we are particularly interested in the following: the methodology in physical education and sport; influence of some ions on effort capacity; psychological profiles of students regarding physical education; methodology in sport gymnastics; the selection of performance sportsmen.

Other articles approach particular subjects regarding different sports: swimming, rhythmic and artistic gymnastics, handball, volleyball, basketball, athletics, ski, football, field and table tennis, wrestling, sumo.

The authors of the two rubrics are doctors, professors and educators, from universities and preuniversity education, trainers, scientific researchers etc.

Other rubrics of the journal are: the editorial, editorial news, reviews of the latest books in the field and others that are presented rarely (inventions and innovations, universitaria, preuniversitaria, forum, memories, competition calendar, portraits, scientific events).

We highlight the rubric "The memory of the photographic eye", where photos, some very rare, of sportsmen in the past and present are presented.

Articles signed by authors from the Republic of Moldova regarding the organization of sport education, variability of the cardiac rhythm, the stages of effort adaptability and articles by some authors from France, Portugal, Canada must also be mentioned.

The main objective of the journal is highlighting the results of research activities as well as the permanent and actual dissemination of information for specialists in the field. The journal assumes an important role regarding the achievement of necessary scores of the teaching staff in the university and preuniversity education as well as of doctors in the medical network (by recognizing the journal by the Romanian College of Physicians), regarding didactic and professional promotion.

Another merit of the journal is the obligatory publication of the table of contents and an English summary for all articles. Frequently articles are published in extenso in a language with international circulation (English, French).

The journal is published quarterly and the works are accepted for publication in the Romanian and English language. The journal is sent by e-mail or on a floppy disk (or CD-ROM) and printed, by mail at the address of the editorial staff. The works of contributors that are resident abroad and of Romanian authors must be mailed to the Editorial staff at the following address:

„Palestrica of the third millennium – Civilization and sport"
Chief Editor: Prof. dr. Traian Bocu
Contact address: palestrica@gmail.com or traian_bocu@yahoo.com
Mail address: Clinicilor street no. 1 postal code 400006, Cluj-Napoca, România
Telephone:0264-598575
Website: www.pm3.ro

Objectives

Our intention is that the journal continues to be a route to highlight the research results of its contributors, especially by stimulating their participation in project competitions. Articles that are published in this journal are considered as part of the process of promotion in one's university career (accreditation that is obtained after consultation with the National Council for Attestation of Universitary Titles and Diplomas).

We also intend to encourage the publication of studies and research, that include original relevant elements especially from young people. All articles must bring a minimum of personal contribution (theoretical or practical), that will be highlighted in the article.

In the future we propose to accomplish criteria that would allow the promotion of the journal to superior levels according international recognition.

THE STRUCTURE AND SUBMISSION OF ARTICLES

The manuscript must be prepared according to the stipulations of the International Committee of Medical Journal Editors (http://www.icmjee.org).

The number of words for the electronic format:

– 4000 words for original articles;

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– 2000 words for case studies;
– 5000-6000 words for review articles.

Format of the page: edited in WORD format, A4. Printed pages of the article will be numbered successively from 1 to the final page.

Font: Times New Roman, size 11 pt.; it should be edited on a full page, with diacritical marks, double spaced, respecting equal margins of 2 cm.

Illustrations:

The images (graphics, photos etc.) should be numbered consecutively in the text, with arabic numbers. They should be edited with EXCEL or SPSS programs, and sent as distinct files: „figure 1.tif", „figure 2. jpg", and at the editors demanding in original also. Every graphic should have a legend, written **under** the image.

The tables should be numbered consecutively in the text, with roman numbers, and sent as distinct files, accompanied by a legend that will be put **above** the table.

PREPARATION OF THE ARTICLES

1. Title page: – includes the title of article (maximum 45 characters), the name of authors followed by surname, work place, mail address of the institute and mail adress and e-mail address of the first author. It will follow the name of article in the English language.

2. Summary: For original articles a summary structured like this is necessary: (Premize-Background, Obiective-Aims, Metode-Methods, Resultate-Results, Concluzii-Conclusions), in the Romanian language, of maximum 250 words, followed by 3-8 key words (if its possible from the list of established terms). All articles will have a summary in the English language. Within the summary (abstract) abbreviations, footnotes or bibliographic references should not be used.

Premises and objectives. Description of the importance of the study and explanation of premises and research objectives.

Methods. Include the following aspects of the study:

Description of the basic category of the study: of orientation and applicative.

Localization and the period of study. Description and size of groups, sex (gender), age and other socio-demographic variables should be given.

Methods and instruments of investigation that are used.

Results. The descriptive and inferential statistical data (with specification of the used statistical tests): the differences between the initial and the final measurement, for the investigated parameters, the significance of correlation coefficients are necessary. The specification of the level of significance (the value ***p*** or the dimension of effect ***d***) and the type of the used statistical test etc are obligatory.

Conclusions. Conclusions that have a direct link with the presented study should be given.

Orientation articles and case studies should have an unstructured summary (without respecting the structure of experimental articles) to a limit of 150 words.

3. Text

Original articles should include the following chapters which will not be identical with the summary titles: Introduction (General considerations), Hypothesis, Materials and methods (including ethical and statistical informations), Results, Discussing results, Conclusions and suggestions. Other type of articles, as orientation articles, case studies, Editorials, do not have an obligatory format. Excessive abbreviations are not recommended. The first abbreviation in the text is represented first *in extenso*, having its abbreviation in parenthesis, and thereafter the short form should be used.

Authors must undertake the responsibility for the correctness of published materials.

4. Bibliography

The bibliography should include the following data:

For articles from journals or other periodical publications the international Vancouver Reference Style should be used: the name of all authors as initials and the surname, the year of publication, the title of the article in its original language, the title of the journal in its international abbreviation (italic characters), number of volume, pages.

Articles: Pop M, Albu VR, Vişan D et al. Probleme de pedagogie în sport. Educaţie Fizică şi Sport 2000; 25(4):2-8.

Books: Drăgan I (coord.). Medicina sportivă, Editura Medicală, 2002, Bucureşti, 2002, 272-275.

Chapters from books: Hăulică I, Bălţatu O. Fiziologia senescenţei. In: Hăulică I. (sub red.) Fiziologia umană, Ed. Medicală, Bucureşti, 1996, 931-947.

Starting with issue 4/2010, every article should include a minimum of 15 bibliographic references and a maximum of 100, mostly journals articles published in the last 10 years. Only a limited number of references (1-3) older than 10 years will be allowed. At least 20% of the cited resources should be from recent international literature (not older than 10 years).

Peer-review process

In the final stage all materials will be closely reviewed by at least two competent referees in the field (Professors, and Docent doctors) so as to correspond in content and form with the requirements of an international journal. After this stage, the materials will be sent to the journal's referees, according to their profiles. After receiving the observations from the referees, the editorial staff shall inform the authors of necessary corrections and the publishing requirements of the journal. This process (from receiving the article to transmitting the observations) should last about 4 weeks. The author will be informed if the article was accepted for publication or not. If it is accepted, the period of correction by the author will follow in order to correspond to the publishing requirements.

Conflict of interest

The authors must mention all possible conflicts of interest including financial and other types. If you are sure that there is no conflict of interest we ask you to mention this. The financing sources should be mentioned in your work too.

Specifications

The specifications must be made only linked to the people outside the study but which have had a substantial contribution, such as some statistical processing or review of the text in the English language. The authors have the responsibility to obtain the written permission from the mentioned persons with the name written within the respective chapter, in case the readers refer to the interpretation of results and conclusions of these persons. Also it should be specified if the article uses some partial results from certain projects or if these are based on master or doctoral theses sustained by the author.

Ethical criteria

The Editors will notify authors in due time, whether their article is accepted or not or whether there is a need to modify texts. Also the Editors reserve the right to edit articles accordingly. Papers that have been printed or sent for publication to other journals will not be accepted. All authors should send a separate letter containing a written statement proposing the article for submission, pledging to observe the ethics of citation of sources used (bibliographic references, figures, tables, questionnaires).

For original papers, according to the requirements of the Helsinki Declaration, the Amsterdam Protocol, Directive 86/609/EEC, and the regulations of the Bioethical Committees from the locations where the studies were performed, the authors must provide the following:

- the informed consent of the family, for studies in children and juniors;
- the informed consent of adult subjects, patients and athletes, for their participation;
- malpractice insurance certificate for doctors, for studies in human subjects;
- certificate from the Bioethical Committees, for human study protocols;
- certificate from the Bioethical Committees, for animal study protocols.

The data will be mentioned in the paper, in the section Materials and Methods. The documents will be obtained before the beginning of the study. Will be mentioned also the registration number of the certificate from the Bioethical Committees.

Editorial submissions will be not returned to authors, whether published or not.

FOR THE ATTENTION OF THE SPONSORS

Requests for advertising space should be sent to the Editors of the "Palestrica of the Third Millennium" journal, 1, Clinicilor St., 400006, Cluj-Napoca, Romania. The price of an A4 full colour page of advertising for 2012 will be EUR 250 and EUR 800 for an advert in all 4 issues. The costs of publication of a logo on the cover will be determined according to its size. Payment should be made to the Romanian Medical Society of Physical Education and Sports, CIF 26198743. Banca Transilvania, Cluj branch, IBAN: RO32 BTRL 0130 1205 S623 12XX (RON).

SUBSCRIPTION COSTS

The "Palestrica of the Third Millennium" journal is printed quarterly. The subscription price is 100 EUR for institutions abroad and 50 EUR for individual subscribers outside Romania. For Romanian institutions, the subscription price is 120 RON, and for individual subscribers the price is 100 RON. Note that distribution fees are included in the postal costs.

Payment of subscriptions should be made by bank transfer to the Romanian Medical Society of Physical Education and Sports, CIF 26198743. Banca Transilvania, Cluj branch, IBAN: RO32 BTRL 0130 1205 S623 12XX (RON), RO07 BTRL 01,304,205 S623 12XX (EUR), RO56 BTRL 01,302,205 S623 12XX (USD). SWIFT: BTRLRO 22

Please note that in 2010 a tax for each article submitted was introduced. Consequently, all authors of articles will pay the sum of 150 RON to the Romanian Medical Society of Physical Education and Sport published above. Authors who have paid the subscription fee will be exempt from this tax. Other information can be obtained online at www.pm3.ro "Instructions for Authors", at our e-mail address palestrica@gmail.com or at the postal address: 1, Clinicilor St., 400006, Cluj-Napoca, Romania, phone: +40264-598575.

INDEXING

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ÎN ATENŢIA COLABORATORILOR

Tematica revistei

Ca tematică, revista are un caracter multidisciplinar orientat pe domeniile biomedical, sănătate, efort fizic, ştiinţe sociale, aplicate la activităţile de educaţie fizică şi sport, astfel încât subiectele tratate şi autorii aparţin mai multor specialităţi din aceste domenii. Principalele rubrici sunt: „Articole originale" şi „Articole de sinteză".

Exemplificăm rubrica „Articole de sinteză" prin temele importante expuse: stresul oxidativ în efortul fizic; antrenamentul mintal; psihoneuroendocrinologia efortului sportiv; cultura fizică în practica medicului de familie; sporturi extreme şi riscuri; determinanţi emoţionali ai performanţei; recuperarea pacienţilor cu suferinţe ale coloanei vertebrale; sindroame de stres şi psihosomatică; educaţia olimpică, aspecte juridice ale sportului; efortul fizic la vârstnici; tulburări ale psihomotricităţii; pregătirea sportivă la altitudine; fitness; biomecanica mişcărilor; testele EUROFIT şi alte metode de evaluare a efortului fizic; reacţii adverse ale eforturilor; endocrinologie sportivă; depresia la sportivi; dopajul clasic şi genetic; Jocurile Olimpice etc.

Dintre articolele consacrate studiilor şi cercetărilor experimentale notăm pe cele care vizează: metodica educaţiei fizice şi sportului; influenţa unor ioni asupra capacităţii de efort; profilul psihologic al studentului la educaţie fizică; metodica în gimnastica sportivă; selecţia sportivilor de performanţă.

Alte articole tratează teme particulare vizând diferite sporturi: înotul, gimnastica ritmică şi artistică, handbalul, voleiul, baschetul, atletismul, schiul, fotbalul, tenisul de masă şi câmp, luptele libere, sumo.

Autorii celor două rubrici de mai sus sunt medici, profesori şi educatori din învăţământul universitar şi preuniversitar, antrenori, cercetători ştiinţifici etc.

Alte rubrici ale revistei sunt: editorialul, actualităţile editoriale, recenziile unor cărţi - ultimele publicate în domeniu, la care se adaugă şi altele prezentate mai rar (invenţii şi inovaţii, universitaria, preuniversitaria, forum, remember, calendar competiţional, portrete, evenimente ştiinţifice).

Subliniem rubrica "Memoria ochiului fotografic", unde se prezintă fotografii, unele foarte rare, ale sportivilor din trecut şi prezent.

De menţionat articolele semnate de autori din Republica Moldova privind organizarea învăţământului sportiv, variabilitatea ritmului cardiac, etapele adaptării la efort, articole ale unor autori din Franţa, Portugalia, Canada.

Scopul principal al revistei îl constituie valorificarea rezultatelor activităţilor de cercetare precum şi informarea permanentă şi actuală a specialiştilor din domeniile amintite. Revista îşi asumă şi un rol important în îndeplinirea punctajelor necesare cadrelor didactice din învăţământul universitar şi preuniversitar precum şi medicilor din reţeaua medicală (prin recunoaşterea revistei de către Colegiul Medicilor din România), în avansarea didactică şi profesională.

Un alt merit al revistei este publicarea obligatorie a cuprinsului şi a câte unui rezumat în limba engleză, pentru toate articolele. Frecvent sunt publicate articole în extenso într-o limbă de circulaţie internaţională (engleză, franceză).

Revista este publicată trimestrial iar lucrările sunt acceptate pentru publicare în limba română şi engleză. Articolele vor fi redactate în format WORD (nu se acceptă articole în format PDF). Expedierea se face prin e-mail sau pe dischetă (sau CD-ROM) şi listate, prin poştă pe adresa redacţiei. Lucrările colaboratorilor rezidenţi în străinătate şi ale autorilor români trebuie expediate pe adresa redacţiei:

Revista «Palestrica Mileniului III»
Redactor şef: Prof. dr. Traian Bocu
Adresa de contact: palestrica@gmail.com sau traian_bocu@yahoo.com
Adresa poştală: Str. Clinicilor nr.1 cod 400006, Cluj-Napoca, România
Telefon:0264-598575
Website: www.pm3.ro

Obiective

Ne propunem ca revista să continue a fi o formă de valorificare a rezultatelor activităţii de cercetare a colaboratorilor săi, în special prin stimularea participării acestora la competiţii de proiecte. Menţionăm că articolele publicate în cadrul revistei sunt luate în considerare în procesul de promovare în cariera universitară (acreditare obţinută în urma consultării Consiliului Naţional de Atestare a Titlurilor şi Diplomelor Universitare).

Ne propunem de asemenea să încurajăm publicarea de studii şi cercetări, care să cuprindă elemente originale relevante mai ales de către tineri. Toate articolele vor trebui să aducă un minimum de contribuţie personală (teoretică sau practică), care să fie evidenţiată în cadrul articolului.

În perspectivă ne propunem îndeplinirea criteriilor care să permită promovarea revistei la niveluri superioare cu recunoaştere internaţională.

STRUCTURA ŞI TRIMITEREA ARTICOLELOR

Manuscrisul trebuie pregătit în acord cu prevederile Comitetului Internaţional al Editurilor Revistelor Medicale (http://www.icmjee.org).

Numărul cuvintelor pentru formatul electronic:

– 4000 cuvinte pentru articolele originale,
– 2000 de cuvinte pentru studiile de caz,
– 5000–6000 cuvinte pentru articolele de sinteză.

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Format pagină: redactarea va fi realizată în format A4. Paginile listate ale articolului vor fi numerotate succesiv de la 1 până la pagina finală.

Font: Times New Roman, mărime 11 pt.; redactarea se va face pe pagina întreagă, cu diacritice, la două rânduri, respectând margini egale de 2 cm pe toate laturile.

Ilustraţiile:

Figurile (grafice, fotografii etc.) vor fi numerotate consecutiv în text, cu cifre arabe. Vor fi editate cu programul EXCEL sau SPSS, şi vor fi trimise ca fişiere separate: „figura 1.tif", „figura 2. jpg", iar la solicitarea redacţiei şi în original. Fiecare grafic va avea o legendă care se trece **sub** figura respectivă.

Tabelele vor fi numerotate consecutiv în text, cu cifre romane, şi vor fi trimise ca fişiere separate, însoţite de o legendă ce se plasează **deasupra** tabelului.

PREGĂTIREA ARTICOLELOR

1. Pagina de titlu: – cuprinde titlul articolului (maxim 45 caractere), numele autorilor urmat de prenume, locul de muncă, adresa postală a instituţiei, adresa poştală şi adresa e-mail a primului autor. Va fi urmat de titlul articolului în limba engleză.

2. Rezumatul: Pentru articolele experimentale este necesar un rezumat structurat (Premize-Background, Obiective-Aims, Metode-Methods, Rezultate-Results, Concluzii-Conclusions), în limba română, de maxim 250 cuvinte (20 de rânduri, font Times New Roman, font size 11), urmat de 3–5 cuvinte cheie (dacă este posibil din lista de termeni consacraţi). Toate articolele vor avea un rezumat în limba engleză. Nu se vor folosi prescurtări, note de subsol sau referinţe.

Premize şi obiective: descrierea importanţei studiului şi precizarea premizelor şi obiectivelor cercetării.

Metodele: includ următoarele aspecte ale studiului:

Descrierea categoriei de bază a studiului: de orientare sau aplicativ.

Localizarea şi perioada de desfăşurare a studiului. Colaboratorii vor prezenta descrierea şi mărimea loturilor, sexul (genul), vârsta şi alte variabile socio-demografice.

Metodele şi instrumentele de investigaţie folosite.

Rezultatele vor prezenta datele statistice descriptive şi inferenţiale obţinute (cu precizarea testelor statistice folosite): diferenţele dintre măsurătoarea iniţială şi cea finală, pentru parametri investigaţi, semnificaţia coeficienţilor de corelaţie. Este obligatorie precizarea nivelului de semnificaţie (valoarea ***p*** sau mărimea efectului ***d***) şi a testului statistic folosit etc.

Concluziile care au directă legătură cu studiul prezentat.

Articolele de orientare şi studiile de caz vor avea un rezumat nestructurat (fără a respecta structura articolelor experimentale) în limita a 150 cuvinte (maxim 12 rânduri, font Times New Roman, font size 11).

3. Textul

Articolele experimentale vor cuprinde următoarele capitole: Introducere, Ipoteză, Materiale şi Metode (inclusiv informaţiile etice şi statistice), Rezultate, Discutarea rezultatelor, Concluzii (şi propuneri). Celelalte tipuri de articole, cum ar fi articolele de orientare, studiile de caz, editorialele, nu au un format impus.

Răspunderea pentru corectitudinea materialelor publicate revine în întregime autorilor.

4. Bibliografia

Bibliografia va cuprinde:

Pentru articole din reviste sau alte periodice se va menţiona: numele tuturor autorilor şi iniţialele prenumelui, anul apariţiei, titlul articolului în limba originală, titlul revistei în prescurtare internaţională (caractere italice), numărul volumului, paginile

Articole: Pop M, Albu VR, Vişan D et al. Probleme de pedagogie în sport. Educaţia Fizică şi Sportul 2000; 25(4):2-8.

Cărţi: Drăgan I (coord.). Medicina sportivă aplicată. Ed. Editis, Bucureşti 1994, 372-375.

Capitole din cărţi: Hăulică I, Bălţatu O. Fiziologia senescenţei. În: Hăulică I. (sub red.) Fiziologia umană. Ed. Medicală, Bucureşti 1996, 931-947.

Începând cu revista 4/2010, fiecare articol va trebui să se bazeze pe un minimum de 15 şi un maximum de 100 referinţe bibliografice, în majoritate articole nu mai vechi de 10 ani. Sunt admise un număr limitat de cărţi şi articole de referinţă (1-3), cu o vechime mai mare de 10 ani. Un procent de 20% din referinţele bibliografice citate trebuie să menţioneze literatură străină studiată, cu respectarea criteriului actualităţii acesteia (nu mai vechi de 10 ani).

Procesul de recenzare (peer-review)

Într-o primă etapă toate materialele sunt revizuite riguros de cel puţin doi referenţi competenţi în domeniu respectiv (profesori universitari doctori şi doctori docenţi) pentru ca textele să corespundă ca fond şi formă de prezentare cerinţelor unei reviste serioase. După această etapă materialele sunt expediate referenţilor revistei, în funcţie de profilul materialelor. În urma observaţiilor primite din partea referenţilor, redacţia comunică observaţiile autorilor în vederea corectării acestora şi încadrării în cerinţele de publicare impuse de revistă. Acest proces (de la primirea articolului până la transmiterea observaţiilor) durează aproximativ 4 săptămâni. Cu această ocazie se comunică autorului daca articolul a fost acceptat spre publicare sau nu. În situaţia acceptării, urmează perioada de corectare a articolului de către autor în vederea încadrării în criteriile de publicare.

Conflicte de interese

Se cere autorilor să menţioneze toate posibilele conflicte de interese incluzând relaţiile financiare şi de alte tipuri. Dacă sunteţi siguri că nu există nici un conflict de interese vă rugăm să menţionaţi acest lucru. Sursele de finanţare ar trebui să

fie menţionate în lucrarea dumneavoastră.

Precizări

Precizările trebuie făcute doar în legătură cu persoanele din afara studiului, care au avut o contribuţie substanţială la studiul respectiv, cum ar fi anumite prelucrări statistice sau revizuirea textului în limba engleză. Autorii au responsabilitatea de a obţine permisiunea scrisă din partea persoanelor menţionate cu numele în cadrul acestui capitol, în caz că cititorii se referă la interpretarea rezultatelor şi concluziilor acestor persoane. De asemenea, la acest capitol se vor face precizări în cazul în care articolul valorifică rezultate parţiale din anumite proiecte sau dacă acesta se bazează pe teze de masterat sau doctorat susţinute de autor, alte precizări.

Criterii deontologice

Redacţia va răspunde în timp util autorilor privind acceptarea, neacceptarea sau necesitatea modificării textului şi îşi rezervă dreptul de a opera modificări care vizează forma lucrărilor.

Nu se acceptă lucrări care au mai fost tipărite sau trimise spre publicare la alte reviste. Autorii vor trimite redacţiei odată cu articolul propus spre publicare, într-un fişier word separat, o declaraţie scrisă în acest sens, cu angajamentul respectării normelor deontologice referitoare la citarea surselor pentru materialele folosite (referinţe bibliografice, figuri, tabele, chestionare).

Pentru articolele originale, în conformitate cu îndeplinirea condiţiilor Declaraţiei de la Helsinki, a Protocolului de la Amsterdam, a Directivei 86/609/EEC şi a reglementărilor Comisiilor de Bioetică din locaţiile unde s-au efectuat studiile, autorii trebuie să prezinte:

- acordul informat din partea familiei, pentru studiile pe copii şi juniori;
- acordul informat din partea subiecţilor adulţi, pacienţi şi sportivi, pentru participare;
- adeverinţă de Malpraxis pentru medici, pentru cercetările/studiile pe subiecţi umani;
- adeverinţă din partea Comisiilor de Etică, pentru protocolul de studiu pe subiecţi umani;
- adeverinţă din partea Comisiilor de Bioetică, pentru protocolul de studiu pe animale.

Datele vor fi menţionate în articol la secţiunea Material şi metodă. Documentele vot fi obţinute înainte de începerea studiului. Se va menţiona şi numărul de înregistrare al adeverinţei din partea Comisiilor de Etică.

Materialele trimise la redacţie nu se restituie autorilor, indiferent dacă sunt publicate sau nu.

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Solicitările pentru spaţiile de reclamă, vor fi adresate redacţiei revistei "Palestrica Mileniului III", Str. Clinicilor nr. 1, cod 400006 Cluj-Napoca, România. Preţul unei pagini de reclamă full color A4 pentru anul 2012 va fi de 250 EURO pentru o apariţie şi 800 EURO pentru 4 apariţii. Costurile publicării unui Logo pe coperţile revistei, vor fi stabilite în funcţie de spaţiul ocupat. Plata se va face în contul Societăţii Medicale Române de Educaţie Fizică şi Sport, CIF 26198743. Banca Transilvania, sucursala Cluj Cod IBAN: RO32 BTRL 0130 1205 S623 12XX (LEI).

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Autorii care au abonament vor fi scutiţi de această taxă de articol.

Alte informaţii se pot obţine online de pe www.pm3.ro „Pentru autori" sau pe adresa de mail a redacţiei palestrica@gmail.com sau pe adresa poştală: Str. Clinicilor nr.1 cod 400006, Cluj-Napoca, România, Telefon:0264-598575.

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