

11. Metodichni vkazivky do orhanizatsii praktychnykh zaniat u spetsialnykh medychnykh hrupakh z dystsypliny "Fyzichne vykhovannia". (2009). [Methodological instructions for the organization of practical classes in special medical groups on discipline "Physical education"]. Senko A.V. editor. Sumy: Vyd-vo SumDU; 57 p. (in Ukrainian).
12. Nikolaiev SU. & Poliukhovych VS. (2009). Rozvytok sylovykh zdibnostei v uchniv starshykh klasiv zasobamy atletychnoi himnastyky. [Development of Power Capabilities of Students of Higher Forms by Facilities of Athletics Gymnastics.] V: Molodizhnyi naukovyi visnyk Skhidnoevropeiskoho natsionalnoho universytetu imeni Lesi Ukrainky: zb. nauk. prats. Lutsk, [Youth Scientific Journal Lesya Ukrainka Eastern European National University]. Physical Education and Sport: 9–12. (in Ukrainian).
13. Ohar HO, Sanzharov VA, Lasytsia VI. Ohar YeH. (2011). Vplyv prohram sylovoho trenuvannia z navantazhenniamy riznoi spriamovanosti na fizychnyi rozvytok i rukhovu pidhotovlenist yunakiv 15–17 rokiv [Influence of the power training with loadings of different orientation on physical development and physical preparedness of youths 15–17 years]. Teoriia ta metodyka fizychnoho vykhovannia [Theory and methods of the physical education]; 10: 37–42. (in Ukrainian).
14. Favorytov VM, Ponomarov VA. Papucha VM. (2009). Rozvytok sylovykh yakosteï yunakiv zasobamy atletychnoi himnastyky [Development of the youth power by means of sports gymnastica]. Visnyk Zaporizkoho natsionalnoho universytetu: zb. nauk. prats. Zaporizhzhia [Visnyk of Zaporizhzhya National University]; 1: 144–152. (in Ukrainian).
15. Khanikiants O. Maksym V. (2012). Atletychna himnastyka yak zasib profilaktyky porushen postavy studentskoi molodi [Athletic Gymnastics as Means of Prevention of Fault in Posture Among Student Youth] V: Fyzichne vykhovannia, sport i kultura zdorovia u suchasnomu suspilstvi: zb. nauk. prats. Lutsk [Physical Education, Sports and the Culture of Public Health in Modern Society]; 1(17): 108–112. (in Ukrainian).
16. Shyian O. Zhmur D. (2015). Atletychna himnastyka u systemi fizychnoho vykhovannia studentskoi molodi [Athletic gymnastics in the system of physical education of students] Sportyvnyi visnyk Prydniprovia [Sports Bulletin Dnieper: nauk. and practical. Zh.]; 1: 80–84. (in Ukrainian).

Цитування на цю статтю:

Ханікянц ОВ. Поширеність, мотиви та особливості занять атлетичною гімнастикою серед осіб різного віку і статі. Вісник Прикарпатського університету. Серія: Фізична культура. 2019 Лют 26; 32: 149–158.

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УДК 796.035:615.825
doi: 10.15330/fcult.32.158-163

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PERCEPTION OF MUSCULOSKELETAL PAIN IN ATHLETES

Враховуючи всю важливість, яку тренери приділяють болю у всіх його проявах, ми прагнули оцінити прояви болю у молодих спортсменів. Наше дослідження було проведено на 118 спортсменах як чоловічої, так і жіночої статей, які заповнили анкету, в котрій містилась інформація про відчуття в опорно-руховому апараті, а також основні фактори, які можуть впливати на чутливість до болю. Результати показують, що найбільша інтенсивність опорно-рухового болю фіксується відразу після тривалих фізичних зусиль, а найменша – під час спортивних ігор. Це дозволяє зробити висновок, що ця невідповідність може бути викликана значним виділенням ендогенних опіоїдів під час гри. З іншого боку, дисбаланс кортизолу в плазмі, застосування анальгетиків або добавок суттєво не впливають на сприйняття болю. Факторами, що сприяють підвищенню сприйняття болю, є стать спортсмена, велика кількість щотижневих тренувань, тривалість спортивної кар'єри спортсмена, кількість важких травм, яких він / вона зазнали.

Ключові слова: м'язовий біль, атлети.

Given the importance that coaches give to algia in all its manifestations, we aim to evaluate the perception of pain in young athletes. The study was conducted on 118 both male and female athletes who completed a questionnaire collecting information on the perception of musculoskeletal algia along with the main factors that may influence algia sensitivity. The questionnaire gathered complex information on age, the particular sport they practiced, age when they started practicing it, total number of weekly training sessions, number of competitions attended by the subject, number of injuries suffered, their location, if hospitalization was needed, duration of recovery, the possibility the subject ever had to give up sports and / or suffered from overtraining syndrome, their participation to psychological training programs, their assessment of the intensity of pain both at rest and during exercise, during and immediately after competitions (using a scale from 1 to 10, with 1 corresponding to minimum pain and 10 to maximum), the use of supplements.

The results show that the highest intensity of musculoskeletal pain is recorded immediately after sustained physical effort and the lowest during sports games, leading to the conclusion that this discrepancy could be caused by a significant discharge of endogenous opioids during games. On the other hand, plasma cortisol imbalances, the use of analgesics or supplements do not significantly affect the perception of pain. The factors contributing to the increased algia perception are the athlete's gender, the high number of weekly workouts, the duration of the athlete's sports career, the number of major injuries he/she suffered.

Key words: muscular algia, athletes.

Introduction

Medicine does not have a monopoly on describing and analysing pain in sports, since it has been recorded a significant transition from physical to bio-psycho-social approaches [6]. While specialists in ergo-physiology have made efforts to discover the effects of sports injuries, the study of pain psychology has shown that it is perceived differently by athletes and by the non-practitioners [1]. Given the importance that coaches have to attribute to pain and the risk of injury in sports [7], our paper aims to evaluate the intensity of pain felt by young athletes in correlation with the various factors that may influence algia sensitivity. Considering that pain perception is related to stress and incongruences in plasma cortisol levels [2], the participants to our study were also questioned about the use of cortisone based products. It seems that supplementation of vitamin D in subjects with a demonstrated deficiency results in reduced perception of pain [3], and supplementation with vitamins C and E reduces aerobic-induced muscle damage [8]. The effect of vitamin C and supplementation on muscle damage and oxidative stress in female athletes: a clinical trial. As a result, the participating athletes were questioned whether and what type of supplements they use.

Materials and methods

The subjects of our study were 118 professional athletes, 51 male and 67 female. The questionnaire gathered complex information on age, the particular sport they practiced, age when they started practicing it, total number of weekly training sessions (to appreciate the influence of systematic effort on algal sensitivity), number of competitions attended by the subject, number of injuries suffered, their location, if hospitalization was needed, duration of recovery, the possibility the subject ever had to give up sports and / or suffered from overtraining syndrome, if the subject was ever diagnosed with high cortisol plasma levels, been treated with hydrocortisone or similar medication, if they ever experienced chronic musculoskeletal pain and where is it located, their use of cortisone-based or other analgesic medications, their participation to psychological training programs, their assessment of the intensity of pain both at rest and during exercise, during and immediately after competitions (using a scale from 1 to 10, with 1 corresponding to minimum pain and 10 to maximum), the use of supplements.

Results

The emerging data, following the application of the questionnaire, was gathered in Table 1. The numbers are between extreme values.

Table 1

The results as recorded after the application of the questionnaire to athletes

Gender	51 M / 67 F
Age	18–24
Which sport do you practise?	Handball, Basketball, Volleyball, Athletics, Sports Dance, Rugby, Wrestling, Bodybuilding, Cycling, Karate
Since when?	4–16 years
Total number of weekly training sessions	4–20 hours
Number of sports competitions you attended	20–300 competitions
How many major injuries did you suffer from?	0–5
The location of your injuries (upper limbs, lower limbs, trunk, pelvic area, neck, head)	upper limbs 80%, lower limbs 20 %
Did your injuries require hospitalization?	5% YES, 95% NO
How long was your recovery?	4 months – 6 months
Have you ever had to give up sports and / or been treated for suffering from the overtraining syndrome?	0,84% YES, 99,16% NO
Have you ever been diagnosed with high cortisol levels?	100% NO
Are you currently suffering from chronic musculoskeletal pain? If affirmative, please specify location (upper limbs, lower limbs, back – upper / lower, trunk, shoulders, pelvic area, neck)	YES lower limbs 4%, NO 96%
Have you ever been treated with hydrocortisone or similar medication?	100% NO
On a scale from 1 to 10, measure pain intensity (10 being maximum and 1 minimum)	a) While resting; 1–10 b) During training sessions; 1–9 c) During games; 1–10 d) Immediately after physical effort; 1–10
Did you follow or are you currently following a psychological training program?	100% NO
Did you use analgesics other than cortisone? Specify the name of the medicine (s)	ibuprofen, other anti-inflammatory drugs
Do you use supplements? Specify type (for recovery purposes, stress support), trade name and give as many details as possible about the composition of the product (amino acids, vitamins, etc.):	Isoton Energy Activ 3, Vitamax, Vitamin C, Calcium, Magnesium, ON 100% Whey gold Standard – relocation, + ON Amino Energy, Sargenor, Glutamine, Aspirin, Food Glucose, My Protein Creatine Monohydrate, My Protein BCA Amino Acids, Supradyn

Table 2

Pain while resting

Rating scale for evaluating pain (1–10)	Number of answers	%
1	28	52,83%
2	7	13,20%
3	5	9,43%
4	3	5,66%
5	3	5,66%
6	2	3,77%
7	2	3,77%
8	0	0%
9	2	3,77%
10	1	1,88%
Total: 53		

The analysis of the responses revealed that the intensity of pain is higher for the female athletes, with a number of 18–20 weekly training hours, aged 21–25 years, with 13–16 years of sports practice, with 3 to 5 major injuries. Overall, the results show that the perception of pain in the participating subjects was not influenced by cortisol plasma level imbalances. In the case of the responding athletes, the percentage of athletes who have suffered from the overtraining syndrome is too low to establish a correlation with pain perception, while the use of analgesics or supplements has no influence upon algia perception.

Tables 2, 3, 4 and 5 detail the responses to pain perception.

Table 3

Pain during training sessions

Rating scale for evaluating pain (1–10)	Number of answers	%
1	7	13,46%
2	7	13,46%
3	8	15,38%
4	4	7,69%
5	12	23,07%
6	2	3,84%
7	8	15,38%
8	2	3,84%
9	2	3,84%
10	0	0%
Total: 52		

Table 4

Pain during sports games

Rating scale for evaluating pain (1-10)	Number of answers	%
1	11	23,91%
2	10	21,73%
3	2	4,34%
4	5	10,86%
5	7	15,21%
6	5	10,86%
7	5	10,86%
8	0	0%
9	0	0%
10	1	2,17%
Total: 46		

Table 5

Pain immediately after physical effort

Rating scale for evaluating pain (1-10)	Perceived pain intensity (number of answers)	%
1	8	17,02%
2	8	17,02%
3	8	17,02%
4	6	12,76%
5	4	8,51%
6	1	2,12%
7	7	14,89%
8	2	4,25%
9	0	0%
10	3	6,38%
Total: 47		

Discussions

When analyzing tables 2, 3, 4 and 5, the results show that the highest percentage of musculoskeletal pain intensity 1 was recorded while resting (52.83%). The highest percentage for intensity 10 (6.38%, corresponding to 3 subjects, all female) was recorded immediately after the effort. It is noteworthy that none of those subjects mentioned the maximum pain as present during the training sessions. The percentages corresponding to intensities 8, 9 and 10 are 5.65% for rest time, 7.68% during training, 2.17% during sports and 10.63% immediately after the exercise. It is well known that endogenous opioids are released into the blood stream both during sports training and as a consequence of acute exercise [4] and that these substances relieve pain [5]. This probably explains the relatively small percentage of subjects experiencing intense pain during games. It is possible that in some young athletes, experiencing pain during rest could be triggered or exacerbated by late-onset muscle pain, and the increase in pain intensity immediately after exercise is the result of immediate muscle fever. In fact, given the small number of subjects suffering from chronic musculoskeletal pain, it can be inferred that pain was generally inherent to muscle fever. Since none of the subjects followed a psychological training program, we cannot appreciate the influence of this particular factor on the perception of pain.

Conclusions

1. Pain was perceived more intensely by female subjects who followed a training program with many weekly hours, whom have been practicing sports for a long period of time (and consequently the chronological age is correspondingly higher) as well as by subjects who have suffered a relatively large number of major injuries.

2. Apparently, cortisol plasma levels, use of analgesics or supplements do not significantly influence the perception of pain in the participants to our study.

3. In performance athletes, the highest intensity of musculoskeletal pain is recorded immediately after physical exercise and the smallest intensity during games.

4. A plausible cause for feeling less pain during games than during sports training could be the discharge of endogenous opioids.

References

1. Addison T, Kremer J, Bell R. Understanding the psychology of pain in sport. *The Irish Journal of Psychology*. 1998; 19(4): 485-503.
2. Hannibal KE, Bishop MD. Chronic stress, cortisol dysfunction, and pain: a psychoneuroendocrine rationale for stress management in pain rehabilitation. *Phys Ther*. 2014; 94(12):1816-25.
3. Helde-Frankling M, Björkhem-Bergman L. Vitamin D in Pain Management. *Int J Mol Sci*. 2017; 18(10): 2170.
4. Harber VJ, Sutton JR. Endorphins and exercise. *Sports Med*. 1984; 1(2): 154-71.
5. Holden JE, Jeong Y, Forrest JM. The endogenous opioid system and clinical pain management. *AACN Clin Issues*. 2005; 16(3): 291-301.
6. Milne C. Pain and injury in sport: social and ethical analysis. *Br J Sports Med*. 2006; 40(11): 950-951.
7. Nixon HL. Coaches' Views of Risk, Pain and Injury in Sport, with Special Reference to Gender Differences, *Human kinetics journals* 1994; 11(1): 79-87.
8. Taghiyar M, Darvishi L, Askari G, Feizi A, Hariri M, Mashhadi N.S, et al. The effect of vitamin C and supplementation on muscle damage and oxidative stress in female athletes: a clinical trial. *International Journal of Preventive Medicine*. 2013; 4(Suppl 1): 16-22.

Цитування на цю статтю:

Hagiu Bogdan-Alexandru, Puni Rareş Alexandru, Iacob Radu Mihai. Perception of musculoskeletal pain in athletes. *Вісник Прикарпатського університету. Серія: Фізична культура*. 2019 Лют 26; 32: 158-163.

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УДК 376.24:612.76
doi: 10.15330/fcult.32.163-168

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PREVENTION OF OBESITY AND BALANCE PROBLEMS THROUGH ADAPTED PHYSICAL EXERCISES IN PERSONS WITH DOWN SYNDROME

Синдром Дауна є захворюванням, викликаним наявністю додаткової хромосоми в генетичній конструкції людини. Це захворювання супроводжується серцево-судинними недугами, легневими розладами, порушення функції щитоподібної залози, дисфункцією кишечника, судом, ожирінням, схильністю до інфекцій, імуннодефіцитними станами, лейкемією та розладами центральної нервової системи. Мета. Виявити вплив кінезітерапевтичних засобів і методів на покращення стану здоров'я пацієнтів з синдромом Дауна. У дослідженні взяли участь вісім пацієнтів одного віку та статі у яких було діагностовано синдром Дауна та пов'язані з ним стани. Місцем проведення дослідження був зал гімнастики факультету фізичного виховання і спорту Іасі. Процедури проводилися з 15.01. по 15.06.2018 р. з частотою 3 рази протягом тижня. Під час дослідження використовували таке обладнання: подограф, сантиметровастрічка, медична вага, мати, дзеркала, гімнастичний кулі та кола. При виконанні вправ застосовували ігровий метод, що підвищувало ефективність реалізації завдань і полегшувало перебіг адаптаційних процесів до фізичних навантажень. Результати. Одним із проявів ефективності застосованих засобів і методів кінезітерапії було зменшення індексу ваги тіла. Водночас вірогідно, порівняно з вихідним станом, покращилися функціональні показники серцево-судинної системи, а також зростає величина екскурсії грудної клітки.

Ключові слова: синдром Дауна, ожиріння, серцево-судинна система, кінезітерапія.

Down syndrome is a medical condition caused by the presence of an additional chromosome in the genetic (genome) construction of the affected. Down syndromes are cardiovascular diseases, pulmonary disorders, thyroid disorders, intestinal dysfunction, seizures, obesity, susceptibility to infections, immune system diseases, leukemia, and central nervous system disorders. The underlying hypothesis was to verify whether the proposed recovery programs are tolerated by the subjects, improving the symptomatology and to what extent kinetherapeutic methods and techniques have made progress in their health condition. In the research, eight subjects of age and gender, all diagnosed with Down's syndrome and associated conditions, took part in the research. The place of the action is represented by the gymnastics hall of the Faculty of Physical Education and Sport Iasi, between 15.01.2018 – 15.06.2018 with a frequency 3 times x week. Materials used in the research were: podograph, metric band, scales, mattresses, mirrors, gymnastics bank, balls and circles. We involved the use of application trails and exercises in the form of games, which included the performance of various tasks and the adaptation to new conditions. The calculation of the final body mass index reveals an improvement in obesity symptoms by decreasing the number of kilograms. We can also see the contribution of physiotherapy to this progression by weight loss gradually, avoiding over-training, a harmful phenomenon for people with Down's syndrome and heart disease. As a result of the interpretation of the data obtained about the chest perimeter in the inspiration, there was a slight increase in the values, indicating an improvement of the respiratory act and a slight adaptation to the effort.

Key words: Down Syndrome, obesity, cardiovascular system, kinesitherapy.

Introduction. Down syndrome is a medical condition caused by the presence of an additional chromosome in the genetic (genome) construction of the affected. On average, it was estimated that one in every 800-900 children was born with this condition, making it the most common known genetic anomaly (Mureșan M. D., 2011).