

THE 15th SPORTS MEDICINE BALKAN CONGRESS

„Health through Physical Exercise, Performance through Sports Medicine“

**BUCHAREST
Hilton Athene Palace
1- 4 October 2008**

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SPORTS MEDICINE REHABILITATION SECTION

NEUROMUSCULAR (PROPRIOCEPTIVE) TRAINING

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Sometimes the proper management of sport injuries can be complex and challenging to sports medicine clinician and team members. In order to prevent athletic injuries and programming the rehabilitation after a joint lesion, understanding the role of proprioception (or as sometimes called neuromuscular properties) is important. Proprioception is one of the main clinical goals and serve to regain functional goals. Therefore, after an injury, proprioception training should be incorporated with all other elements of fitness.

Many researchers have defined proprioception as the afferent input of joint position sense (for example awareness of position or movement). Some others explain proprioception in a broader sense that includes neuromuscular control. Most contemporary authorities define proprioception as a specialized variation of the sensory modality of touch that includes the sensation of joint movement (kinesthesia) and joint position (joint position sense).

During any voluntary movements or perturbations occurring in gait, running or jumping, due to rapid responses of lower and to some extent upper extremities, musculature of these parts play an important role in keeping desirable posture. This is executed with a reflex mechanism to maintain the body's center of mass over the feet (a static or dynamic balance). Any sudden change of the foot or feet position stimulates a sequence of muscle firing that is dependent upon central generators and programs interacting with peripheral reflexes. Afferent information for necessary fine tuning of motor control is provided by proprioceptive, visual, vestibular, and somatosensory receptors. This function altogether is dynamic or so called functional joint stability. Functional stability helps to protect joints from injuries and contribute to performance via mastering certain necessary movements.

Through receptors proprioceptive information is conveyed to upper centers. Proprioception is mediated by peripheral somatosensory receptors in articular, muscular and cutaneous structures. In addition, vestibular and visual organs also serve to send signals related to the body position. Articular structures include nociceptive free-nerve endings and proprioceptive mechanoreceptors consist of Pacinian, Ruffinian corpuscles and GTO. Muscle spindles send messages about the tension of fibres in relation to loading in certain position. Mechanoreceptors do play an important role and a little bit of more pronounced than others. These are specialized neurons translating mechanical deformation (for example during joint rotation) into electrical signals. Mechanoreceptors all appear to contribute to the transmission of peripheral information related to joint position and motion as well as muscle tension. They are involved in regulating muscle activation. Ruffini endings are quick whereas pacinian corpuscle, muscle spindle and golgi tendon organs are slow adapting receptors.

The clinical importance of proprioception is related to functional (dynamic) stability. Functional (dynamic) joint stability can be defined as the ability of appropriately activated muscles to stabilize a joint together with the support of mechanical stabilizers. In essence, dynamic joint stability is the "product" of the proprioceptive system plus mechanical properties. In relation to dynamic (functional) joint stability, cognitive programming plays a role in the neuromuscular control mechanism. This function refers to voluntary movements that are repeated and stored as central commands. The awareness of body position and movement allows various skills to be performed without continuous reference to consciousness. Proprioceptive feedback is crucial in the conscious and unconscious awareness of a joint or limb in motion. Therefore, enhancement of dynamic (functional) joint stability is important both in prevention and rehabilitation of athletic injuries. This requires a constant and appropriate flow of sensory information, integrated with motor output, in a coordinated manner.

Trauma to tissues may result in partial deafferentation by causing mechanoreceptor damage, which can lead to proprioceptive deficits. Consequently, susceptibility to reinjury, may become a possibility because of this decrease in proprioceptive feedback.

If the question is how to train or reeducate proprioception, the key element appears here as "controlled early motion".

There are several advantages of early motion following to injury:

1. There is a decreased disuse effects
2. Stimulation of collagen fiber growth is attained
3. The adhesions (contracture formation) is limited
4. Maintenance of articular cartilage is obtained
5. And better maintenance of joint proprioception is provided.

Following proprioceptive exercises could be involved during a rehabilitation program. These are: Standing; Balancing; Stepping; Walking; Hopping; Jumping. They all should be progressive.

Along with proprioceptive exercises, the program should include a work on strength development of muscles around the involved joint (e.g. in ankle) especially peronealis, gastrosoleus and tibialis anterior muscles.

General training principles: The number of exercises can be around 2-5; The number of repetitions is less in the beginning and more towards later phases; This applies to the number of sets as well; Total duration of a program can be 5 minutes for preventive and up to 15 minutes for rehabilitative purposes; The patients are recommended to do these exercises daily and continue for about 6-10 weeks in order to gain good results.

Evaluation of proprioceptive progression is important. Therefore, objective analysis methods are necessary.

1. Kinesthesia and joint position sense
2. Balance and postural control
3. Muscular latency
4. Non-instrumented methods

Kinesthesia and joint position sensibility are the two major assessment methods of joint proprioception. Kinesthesia is assessed by measuring threshold to detection of passive motion (TTDPM) while joint position sense is assessed by measuring reproduction of passive positioning (RPP) and reproduction of active positioning (RAP). These latter tests are performed at slow angular velocities (0.5 to 2.5 degrees/second) to selectively stimulate Ruffini or Golgi-type mechanoreceptors, and because the test is performed passively, it is believed to maximally stimulate joint receptors while minimally stimulating muscle receptors.

Several researchers utilized PTDs similar in action and design. A device having a moving arm rotating the limb through the axis of the joint is used. A rotational transducer interfaced with a digital microprocessor counter provides the angular displacement values. Pneumatic compression cuffs are placed on each limb distal to the tested joints to reduce cutaneous input. The subjects are blindfolded to eliminate visual cues and headphones with white noise are used to eliminate auditory cues. The subjects are holding an on-off switch to press when they detect the threshold of passive motion or the pre-positioned angle.

TPDPM

The active angle-reproduction test for ankle joint. For the test of active reproduction, an isokinetic dynamometer can be used. The foot is placed in the neutral position. Subjects are blindfolded so that they won't be distracted. The tester passively moves the test limb into the test position and maintains that position for 10s. Then, the ankle is moved back passively to the reference angle. The subject is asked to actively reproduce the previously given test position angle. This is done twice. In case the subject may not bring his ankle back to its test position. This is called subject error and it is recorded. (This can be two to three degrees or more). The average error score is calculated. If the score is high, the subject has proprioception deficit.

The Evaluation of Passive Movement Sense for Ankle joint. A device (simple box) with a movable platform that rotates around a single axis is used. Ankle is placed on the platform. The platform is moved by an electric motor that rotates the foot on an axis at a rate of 0.50/sec. Movement can be stopped any time by a hand-held switch. The subject is blindfolded and wears a headset so that he won't be distracted by sight and sound. The same procedure as the previous test is applied to produce the angle set by the patient himself. Isokinetic devices and KAT 2000 are other methods that help for evaluation of neuromuscular properties.

Noninstrumented, clinically applicable tests to assess neuromuscular and functional deficits are reliable and valid for both research and clinical purposes. Limb matching tasks are examples to evaluate proprioception without utilizing an electromechanical device. Providing different angles joint movements, the patients are asked to reproduce the given angle with the other limb.

Although various hoptests have been used to measure the lower limb power and functional ability of the athletes, they are assumed to be useful in the evaluation of proprioceptive status of the injured athlete at the end of the rehabilitation periods. These tests are performed either for distance or time to evaluate lower extremity symmetry.

SPORTS INJURIES AND REHABILITATION

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Sports Injuries. Overuse injuries and acute injuries

Overuse injuries. Affect skin, nerves, bursae, tendons, muscles, ligaments, joints, cartilage of joints and bones. Overuse injuries are increasing in recent years with increasing demands for higher performance for athletes. An overuse injury occurs when repetitive micro trauma exceed the capacity of the tissue to repair itself.

Acute Injuries. Bruises, lacerations, injuries to muscles, tendons, ligaments, nerves and blood vessels, as also dislocations and fractures are discussed. Factors which pre-dispose to sports injuries are intrinsic and extrinsic.

Rehabilitation of sports injuries. When to start. Aims of rehabilitation and correct way for the athletes to return to their original sport. Return to play only when the athlete is 100% recover and has regained the flexibility of the joints.

DYNAMIC TAPING

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The application of tape is an art. Practice is essential to good taping. Taping refers to the application of some type of adhesive tape that adheres to the skin of a particular joint or to a limb. Tape if applied correctly, will provide support and compression. To maximize the effectiveness of any taping technique, it is important to have a basic understanding of what you are trying to achieve and what taping can and cannot do. To maximize the effectiveness of any taping technique, it is important to have a basic understanding of the anatomy and function of the tissues you are trying to support. In addition, it is extremely important to have knowledge how an injury occurred. The soft tissues sometime affected are muscle, tendon, fascia, cartilage, joint capsule, ligament and skin. These structures are often discussed separately, however, they are all intimately related and, therefore, must be considered together.

The primary aim of taping techniques is to provide support and protection to soft tissues without limiting their function unnecessarily. These techniques can be applied both before an injury and after an injury during both the early, and/or later stages of injury management.

The goals of prophylactic taping are the support of areas from excessive or repeated stresses, and to support joints that have a history of injury.

To provide a measure of soft-tissue (i.e. skin, muscle, tendon, ligament and joint capsule) support by placing injured structures in a position of minimal stress, and to enable the injured athlete to resume activity (often modified) which assists in regaining strength and flexibility of the joint or limb are the goals of the taping that we use in rehabilitation.

With the taping you allow the harmless movement and give Proprioception and Neuromuscular control, this assists with optimal healing and repair, therefore, eliminating the need for total immobilization of minor injuries.

There are many different ways to tape and you must always remember what tape can and cannot do. It is equally important to recognize when an injured limb or joint should not be taped. The beginner should start slowly and after much practice efficiency will be the result.

ROLE OF KINESIOTHERAPY IN INJURY PREVENTION AND PERFORMANCE ENHANCEMENT

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INTRODUCTION. The scientific literature reveals a significant increase of the incidence of injuries related to training competition and sports practice. Considering the negative impact of these injuries in athlete's activity, it is important to understand the mechanism of occurrence and also to apply the available methods of prevention.

CONTENT. The aim of this presentation is to establish the risk elements that generate injuries in sports activities and to determinate the most efficient ways to prevent injuries by using the specific physical therapy techniques and methods. Starting with the general objectives of physical therapy (to increase range of motion, strength and endurance, to avoid maladaptive compensatory movement and patterns etc), we can establish which are the most adequate techniques for injuries prevention. Regarding the enhancement, the major objective of training is to improve performance by facilitating biological adaptation. Taking into account the factors and the principles of training and also the physiological consequences of training, we can estimate an improvement of strength, power, balance and coordination by using kinetological means like plyometrics and stretching. Physiological adaptation to exercise, exercises training principles and prescription, factors that modify human strength, practical application of plyometrics and stretching are also important subjects that we need to focus on.

CONCLUSION. Physical therapy plays an important role in athlete's rehabilitation, injuries prevention and improves sports performance.

PLYOMETRICS, NEUROMUSCULAR BASED, INDICATIONS, CONTRAINDICATIONS

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Plyometrics means specific mechanical and neurological components of muscular system. Mechanical components includes: contractile components, non-contractile elements, interaction of the series elastic component, parallel elastic component and contractile component. Every plyometric exercise includes three aspects: eccentric phase, amortization phase, concentric phase. Indications of plyometric exercise depends on few factors like: flexibility, strength, proprioception, age, weight, surface and goals. Also we need to know the limit of plyometric exercise means contraindications: acute phase of inflammation, postoperative period, joint instability.

ROLE OF FLEXIBILITY IN INJURY PREVENTION

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INTRODUCTION. Injuries in sports activities are acute and overuse cause by intrinsic and extrinsic risk factors. Quality of performance is affected by lack of flexibility.

CONTENT. Musculoskeletal injuries represent a major part of accidents in sports. The flexibility represents the ability to move joints through range of motion (ROM).

Optimal flexibility is difficult to define. Physical therapy techniques are used to reduce risk of injuries in sports activities.

In this presentation we intend to discuss about general principles of flexibility, programs, types of stretching (passive, active, ballistic, dynamic, static, PNF), guidelines of stretching, indications, contraindications, recommendations, evaluation and assessment of flexibility, kinetological factors of flexibility and flexibility exercises.

In sports activities is important to identify flexibility requirements for each sport. Inflexibility or lack of flexibility decreases muscle function and adaptability.

Prevention is the first step in treating injuries.

Frequency of sports injuries has increased simultaneously with the enlargement number of participations in organized sports activities.

Musculoskeletal injuries represent a major part of injuries in sport.

CONCLUSION. Inadequate flexibility joint laxity predisposes to injury without a muscular support.

Prevention of musculoskeletal injuries represents the main goal of individual exercise training.

The prevention guidelines of injuries in sport include proper warm-up (before activity) and cool down (after activity) surface, environmental factors. In this purpose preparticipation physical examination includes evaluation of joints (ROM, flexibility), evaluation of strength, assessment of balance and coordination etc.

BALANCE STRATEGIES IN ADOLESCENT ATHLETES WITH IDIOPATHIC SCOLIOSIS

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INTRODUCTION. Idiopathic scoliosis constitutes 80% of all cases of scoliosis. The idiopathic scoliosis may affect the balance control. The aim of this study was to explore the functional effects of structural spinal deformations like idiopathic scoliosis on the balance strategies used during locomotion.

MATERIALS-METHODS. 15 athletes, 12 women and 3 men, (mean age 15 years and 3 months) with curvature between 10 and 30 degrees and 14 control subjects, 12 women and 2 men (mean age 15 years 1 month) were tested during various locomotor tasks including walking on the ground, walking on a line and walking on a beam. Balance control was examined in terms of rotation about the vertical axis (yaw) and on a frontal plane (roll). Kinematics of foot, pelvis, trunk, shoulder, and head rotations were measured with an automatic optical TV image processor in order to calculate angular dispersions and segmental stabilizations. **RESULTS.** Decreasing the walking speed is the main adaptive strategy used in response to balance problems in control subjects as well as athletes with AIS. However, athletes with AIS performed walking tasks more slowly than normal subjects. Moreover, the pelvic stabilization is preserved, despite the structural changes affecting the spine. The biomechanical defect resulting from idiopathic scoliosis mainly affects the yaw head stabilization during locomotion.

CONCLUSIONS. Athletes with AIS show substantial similarities with control subjects in adaptive strategies relative to balance control based on segmental stabilization. In contrast, the loss of the yaw head stabilization strategies, mainly based on the use of vestibular information, probably reflects the presence of vestibular deficits in the patients with AIS.

KEY WORDS: *balance strategies, adolescents, athletes, idiopathic scoliosis.*

THE EFFECTIVENESS OF TAPING IN THE EDEMA AND PAIN OF ANKLE SPRAINS. A CLINICAL TRIAL

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INTRODUCTION. The sprains are the commonest injury of the ankle. The goals of treating acute ankle sprains are to decrease pain and swelling and to protect ankle ligaments from further injury. The aim of this survey is to study the efficacy of ankle taping for the reduction of the pain and acute edema of ankle sprains.

MATERIALS-METHODS. Seven football and five basketball players, 17 to 32 years old, with acute ankle sprain during a play were treated with ankle taping and bandage for 10 days. Another 10 players were treated only with ankle bandage. For all athletes was applied cryotherapy for the first three days and rest for 10 days. The edema and the pain were evaluated on the 1st, 3rd and 10th day following the injury. A tank was used for the pre and post treatment volumetric measurements. The VAScale was used for the evaluation of the pain.

RESULTS. There were not found significant differences between the two groups ankle edema reduction. The pain was significantly less in the group with ankle taping on the 3rd day following the injury, but not different the 10th day.

CONCLUSION. The ankle taping in acute posttraumatic period cannot decrease the posttraumatic edema of ankle sprain, but has effect on the pain the first 3 days.

THE EFFECTIVENESS OF PHYSIOTHERAPY INTERVENTION IN THE TREATMENT OF TENDINOPATHY.
REVIEW

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Background. Tendinopathy is a degenerative not an inflammatory condition of tendons with a lot of consequent unpleasant symptoms, however it is essential these symptoms be clarified by those of tendinitis. The effectiveness of physiotherapy methods for the treatment of tendinopathy, as a selection of the most suitable has not been defined. **Object.** The effectiveness of physiotherapy intervention in rehabilitation of athletes that suffers from tendinopathies. **Study design.** Systematic review.

Methods. A computerised literature search of the entire Medline and PEDRO (Physiotherapy Evidence Database) for the physiotherapy approach of tendinopathy. Using the terms tendinopathy, physiotherapy, rehabilitation, we found forty two (42) studies. Thirteen (13) clinical trials (663 individuals) and two (2) reviews were included, in that were investigated and analyzed the physiotherapy methods. These were: shock wave therapy (SWT) 4 (n=145), low-intensity pulsed ultrasound (LIPUS) 2 (n=39), low-level laser therapy (LLLT) 2 (n=72), electrotherapy 1 (n=48), therapeutic massage 1 (n=27), thermotherapy 2 (n=47), eccentric exercise 4 (n=184), concentric exercise 1 (n=49) and night splint 2 (n=48).

Results. The analysis show that laser therapy reduces the pain at 95%, increases the strength and the efficacy, eccentric exercise also reduces the pain at 60% and the combination of two methods has likewise spectacular outcomes (reduction of pain at 60%, increase of strength at 45%).

Conclusion. The physiotherapy methods have efficient effect in the symptoms of tendinopathy. Some more and some less. Certainly we should differentiate the physiotherapy approach in tendinopathy versus tendinitis. There is necessity of new studies that will quantify the application of physiotherapy methods.

Keywords: tendinopathy, physiotherapy, rehabilitation.

THE THERAPEUTIC EXERCISE IN THE ANTIQUITY

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The aim of the present work is the value of exercise as well as its beneficial attributes as they are presented on main texts of many known writers of Antiquity. Concretely the work deals with four writers: Plato, Aristotle, Hippocrates and Galino. Two basic and distinguishable significances are met, the *Ipaidotribiki* that in greek means – massage on young people and the gymnastics. Two type of professionals existed: on one hand those who dealt with children as schoolteachers of gymnastics in the sector of education and on the other hand those which undertook the exercise of professional athletes.

As a conclusion of this present work results the existence of a juxtaposition of ideas of all four personalities - authors that are analyzed regarding their thoughts on movement and exercise.

Basic element in all four writers is the importance of measure and balance, in Greek “metro”, regarding the body and the soul. Also gravity is given in the preventive and therapeutic character of exercise. All four agree also that every movement is not exercise. Finally one meets often in texts the need of division of movements in categories depending on the movement and who makes it (energetic - passive etc). Also the obligatory supervision by a professional during the exercise is advised. Naturally the opinion that the exercise is suggested for all ages is common. Finally the usefulness of full recovery (massage etc) is also mentioned as important part of the exercise.

COMPARATIVE STUDY OF RECOVERY AFTER SURGICAL AND NON-SURGICAL TREATMENT OF ACHILLES
TENDON RUPTURE

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The study comprises a number of 25 patients with Achilles tendon total rupture, 22 men and 3 women, aged between 22 and 40. Out of these 15 are sportsmen and 10 practice recreational sports occasionally. All the subjects were allocated either to surgical treatment followed by functional rehabilitation or to non-surgical treatment with eight weeks immobilization, followed by kinetotherapy. The period of follow-up was two years. Evaluation consisted in individual clinical observation, clinical measurements, muscular performance tests and the overall outcome score after the healing of Achilles tendon rupture. Both the patients with surgical treatment as well as those with non-surgical treatment regained a normal functional rehabilitation in an approximately equal interval.

Key words: rupture, Achilles tendon.

THE ROLE OF PHYSIOTHERAPY. WHAT'S THE OPINION OF THE ATHLETIC COMMUNITY IN PREFECTURE OF THESSALONICA?

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The role of Physiotherapy and the attendance of Physiotherapists in athleticism are worldwide established. The lack of relative statistical data in Greece is also acquaintance. So in the frames of Sports medicine of Physiotherapy department of Tehnological Institute of Thessalonica it was decided relative research.

Aim: The statistical recording of attendance of Physiotherapists in the athletic teams in Prefecture of Thessalonica as well as the designation of opinions from all the participants.

METHOD. A different questionnaire filled up from the team managers, coaches, Physiotherapists and the athletes of teams. The questionnaires were supplemented with the method of interview in the team's facilities; the students had this time-consuming work undertaken. In the research participated 108 teams with 2905 athletes from the 10 most popular sports, there existed professional and amateur teams from all the categories, also 7 teams with 134 athletes from paraolympic sports. The supplemented questionnaires were separated per sport, category and team. The answers were grouped and recorded.

RESULTS. The 90% of team managers consider the presence of Physiotherapist essential, while only the 23% of teams occupy a Physiotherapist and mainly the professional teams. The 80% invoke economic reasons for the lack. The 75% believe that it should be obligatory via law the presence of Physiotherapist. The 90% of Physiotherapist want to created specialisation in Athletic Physiotherapy. The 80% believe that the Physiotherapist in collaboration with the Doctor, are responsible for athlete's rehabilitation.

CONCLUSION. Physiotherapy is valorisen in the athletic community. With the obligation via law and the economic help of state that problems can be exceeded. The establishment of specialisation in Athletic Physiotherapy is henceforth necessary.

THE EFFECTS OF THERAPEUTIC TAPING ON PATELLOFEMORAL PAIN SYNDROME. A SYSTEMATIC REVIEW
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Background. Patellofemoral pain syndrome is a condition presenting with anterior knee pain or pain behind the patella. It is very common among the athletes and especially to those who have to run and to jump. The physiotherapy intervention has very good results to the patellofemoral pain. One technique that is commonly used is patella taping. **Objective.** To examine the efficacy of patellar taping on pain control, knee joint kinematics and patellar positioning in subjects with patellofemoral pain syndrome. **Methods.** We searched the English -language literature as MEDLINE, PEDRO, SPORT Discus, using the key words Patellar taping, Therapeutic taping, McConnell taping, Patellofemoral pain, Knee pain. All studies were exclusively recruited patients diagnosed with patellofemoral pain syndrome. We found 14 studies which were divided into 3 categories based on primary outcome measures: 3 were randomized controlled trials on treatment methods and pain, 9 studies on neuromuscular control and 2 on patellar positioning.

Results. After the analysis that we make we found that most of the studies show significant reduction in pain (up to 78%), increase the ability of knee flexion and knee control.

Conclusion. Patellar taping seems to reduce pain and produces clinically meaningful change during activities of daily living and rehabilitation exercises. Although further studies are needed to investigate the effects of patellar taping and possibly the mechanisms for treating patellofemoral pain.

EFFICIENCY OF VERTEBRAL MANIPULATION IN REHABILITATION OF PROFESSIONAL WOMEN GYMNASTIC'S SPONDILOLISTESIS

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Introduction. The spondilolistesis is one of the most frequently problems found to ex professional women gymnastics. Lack of proper treatment causes serious disturbances to dynamic and static activities of backbone, on short, medium and long term (including surgery) with a major impact on social and professional life of those women.

Methods. The research took place on 10 ex professional gymnastics women, 22 to 28 years old, with dinical diagnosis of retrolistesis L5-S1. All patients have hyperlordosis and scoliosis with primary curve on lumbar level. Treatment consisted in bilateral extension-rotation manipulation, manipulations of sacro-iliac joint and central pressure on the S1 level. Clinical evaluation and X- ray examination guided the 6 week's treatment with 3-4 interventions/ week. Results. Due to treatment, we observed that clinical symptoms vanish and on final X- ray examination we observed a significant improvement in backbone's statics.

Conclusions. The treatment determined a positive evolution of retrolistesis, evidenced by clinical and radiological examination. The results allow us to conclude that vertebral manipulation is efficient in rehabilitation of ex professional gymnastics women's retrolistesis.

SPONTANEOUS QUADRICEPS RUPTURE IN ATHLETE: RECONSTRUCTION

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Introduction. The aim of this study is the presentation of an unusual case of spontaneous quadriceps tendon rupture in athlete and the surgical treatment.

Material – Method. A 28 years old athlete has visited the emergency orthopedic department complaining of fulminant pain in the distal third of his femur, during starting to run. On physical examination we found pain on the distal third of the femur, a palpable hole between the ends of the tendon and failure of the knee extension. X-ray was negative for fracture. Surgical reconstruction has done immediately by passing sutures through the patella and by using suture anchors. We amplified and normalized the suture with graft jacket implant, because of the end's debridement. Postoperatively a brace has used for 6 weeks to protect the suture. We start passive and active rehabilitation after the brace elimination. **Results.** Three months postoperatively, the athlete has not any movement limitation of the knee and he returned to his old activities and started again to run. **Conclusion.** The reconstruction of the quadriceps tendon with patella passing sutures, suture anchors and graft jacket implant is effective treatment for ruptures with debridement of the tendon ends.

Key words: quadriceps rupture, anchors, grafts implant.

TREATMENT OF SEVER'S DISEASE IN YOUNG ATHLETES - A COMPARATIVE STUDY

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INTRODUCTION. Sever's disease presents in growing children with local pain, swelling and tenderness over the calcaneal tuberosity. Symptoms are exacerbated with sporting activities that involve jumping (basketball, volleyball, running) and/or on direct contact (e.g. wrestling, football).

Objective. Identifying the most efficient therapeutic approach correlated with clinical and radiological findings.

Material and method. We studied the cases with Sever's disease admitted in the Clinic of Sports Medicine in Craiova between January-June 2008. At admission the patients were clinically and radiological evaluated and then included in one of the 3 protocols: rest for 6 weeks, rest for 10 days associated with non-steroidal anti-inflammatory drugs (NSA) with multimineral, antioxidant supplements and only NSA with multimineral, antioxidant supplements. The follow up was done after 6 weeks and comprised a clinical examination and the completion of a visual analogic scale.

Results. We enrolled 172 patients: 22 to the first group, 121 to the second and 29 to the third group. At follow up the recovered patients comprised for 91% in the first group, 72% ($p = 0,011$) in the second group and 11% ($p = 0,000...$) in the last group. We couldn't establish a correlation between the radiological findings and the prognosis in our study group.

Conclusions. Sever's disease runs a self-limiting course; usually complete recovery is expected in all our cases. Avoiding physical stress appeared to be the most efficient therapeutic approach, the use of NSA with multimineral and antioxidant supplements was effective only in conjunction with rest.

Key words: Sever disease, treatment, athletes.

RESTORE THE PELVIS' TILT AFTER SURGICALLY TREATED COMPLEX ACETABULAR FRACTURES IN ATHLETES

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The dislocated acetabular fractures are often occurred traumas in motoring, parachutism, hang gliding and other highly-energetic sports. The only thing left to do is the surgical stabilization which has been improving for the last years but the problem with pelvis tilt is in fact.

THE PURPOSE OF THE STUDY is to trace the physiotherapy approach to restore the pelvis' tilt after surgical treated complex acetabular fractures in athletes.

Material and method. From February 2000 until July 2008 were treated 29 patients after dislocated complex acetabular fractures in multiple traumas. The surgical stabilization as a limited invasive method was implemented by A. Iotov (2001). Relaxation of m. quadratus lumborum and reactivation of the abdominal muscles was a base of controlling the pelvis' tilt in supine, side and standing positions.

RESULTS. The pain intensity was with average 8, 7 level and regressed to 3, 6 after two weeks. The differences in the levels of the both anterior superior iliac spines in all patients have been eliminating for three weeks. The results of the static endurance test showed reduction of the abdominal muscles inhibition. M. quadratus lumborum was shortness in contrast to flexors. Palpation and specific test after three weeks demonstrated abasement of its tonus and to reach the balance with abdominal muscles.

CONCLUSION. The adequate recovery of the athletes after surgical stabilized dislocated complex acetabular fractures in multiple traumas is needed to control of the pelvis' tilt in the early phase of the physiotherapy program.

Key words: acetabular fractures, pelvis' tilt, physiotherapy.

IMPACTIVE ULTRASOUND AND PHYSIOTHERAPY (SHOCK WAVE)

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The impactive ultrasound (Shock-Wave) is reported in the new system for extra - bodily treatment with impactive waves. This system has completely prepared in order to function in big number of diseases that is cured in the frame of physiotherapy.

The methodology (of system) is based on the use of sound waves that lasts fractions of second and they are in position to multiply in to cellular frame of webs (which beings in the treatment) and create impactive waves (pressures). Thus result analgetic action, reduction of local inflammation, reformation of trichoid vessels and re-activation of correctional processes.

Uses: The impactive ultrasound is a apparatus which was drawn exclusively for the physical treatment but at the same time the re-establishment of many diseases that concerns the musculoskeletal system.

It has application in: epikondylitida, epitrochilitida, recalcification, spine, haematoma, osteophyte, pseudarticulation, tendonitis, periosteitis. The application of extra - bodily treatment with impactive waves is very effective in important pathological situations (mainly arthritis) thanks to his technical and functional facility and in the fact that its application is exterior. Exist many types diseases that can be faced with this treatment as alternative solution or in collaboration with the other traditional methods, without callousness or any one of elsewhere type of sedation. It is used in cases where they concern the hyperthermia, callousness, dissdution recalcificates.

Advantages: •each treatment has small duration; •they only need few applications; •in individual only cases exists need for total callousness; •are minimal the cases where is not allowed the application; •it has minimal side effects; •after researches and applications of this technique it was proved that in enough cases it has been avoided any chirurgicall intervention.

CLINICAL AND REHABILITATION PARTICULARITIES IN STRESS FRACTURE AT PERFORMANCE ATHLETES

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INTRODUCTION. Stress fracture is a microfracture that results from repetitive physical loading on a bone area and is a common injury among athletes. The specific microscopic and macroscopic changes induce some clinical, therapeutic and rehabilitation particularities in this pathology; in diagnosing a stress fracture are important some elements such as: a history of a recent change in training programme or taking up a new activity, the moderate localized pain and tenderness, abnormal appearance on radioisotopic bone scan, CT scan or MRI. An essential component of the management of stress fracture is the identification and modification of risk factors (intrinsic or/and extrinsic) among a particular rehabilitation programme influenced especially by the fracture localization.

MATERIAL AND METHOD. We made a study on 11 performance athletes (age between $29 \pm 3,5$ years) with stress fracture at different skeletal levels (2 at upper limb and 9 at lower limb); a specific rehabilitation programme consisting in physical therapy and physiotherapy was applied to all athletes for 2 months; the monitoring of the patients was made by applying specific tests (for joint mobility near injured area, local muscular force and other specific functional test).

RESULTS AND CONCLUSION. All monitored athletes are fully rehabilitated after 4-8 weeks, but the major changes are made in their training programme in order to avoid future overuse modifications in the bone structure.

Key words: stress fracture, athletes, rehabilitation, overuse, physical therapy.

**REHABILITATION OF SOCCER'S ANKLE SPRAINS: A PARALEL BETWEEN THE FRENCH AND THE
USA EXPERIENCE**

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Injury is a major risk for professional athletes, and for athletes returning to competition after injury the risk is even greater. Rehabilitation of these athletes must minimize the incidence and consequences of injury and ensure that injured athletes are effectively rehabilitated. French experience mention a early management that include RICE (rest, ice, compression and elevation); USA experience talk about pre – functional rehabilitation which begins with PRICE therapy (protection, rest, ice, compression and elevation) both in order to maintain range of motion (ROM). French experience rehabilitation includes 4 components : ROM rehabilitation, progressive muscle strengthening exercises, proprioceptive training and activity – specific training. USA experience: pre – functional rehabilitation and functional rehabilitation : phase I basic elements – fitness, endurance, speed, power and agility; phase II ball and match skill elements; phase III match paced on field rehabilitation.

KEY WORDS: rehabilitation, soccer, ankle sprains.

SYSTEM FOR FUNCTIONAL RATING OF THE RESULTS OF THE KINESITHEAPEUTICAL PROGRAM OF THE PATIENTS WITH ARS - COMPLEX

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The authors determined that the results of the rehabilitation process of patients with ARS – complex depend on the precise rating of the individual rehabilitative potential and the degree of training.

Aim: our complete rating of indices /parameters/, characterizing: duration of the malady; characteristic and localization of the pain; presence and size of the muscular hypotrophy; presence of misbalance and degree of expressiveness among mm.adductores et mm. abductores of articulatio coxæ, mm. flexores et mm. extensores both outer and inner rotators also of articulatio coxæ; presence of misbalance /difference of the strength/ of the three parts of the rectal abdominal muscles; diversion of the normal orthostatic posture and gait in increasing progressive speed of motion; presence of pains in sudden starting, sudden stopping and unexpected turn/face right- about. For the period 2006 – 2007 28 patients were tested/ men, professional footballers/ in different degree of expressiveness of the syndrome.

They were traced according to the following indices:

Anamnesis data: etiology, duration of the malady.

Test of the pain: intensity, type, character, localization

Test of the muscular tonus: hypo- hyper tonus

Test of the muscular disbalance

Test of the volume of movement

Test of the positions of the pelvis

Image diagnosis: Rö – graphics, nuclear magnetic resonance, scientigraphic.

Every index was assessed with a point system with maximum number of points – 10 and the ways of testing and assessing are indicated. The indicated criteria for rating allow enough clinical objectivity

of the stage ratings provide adequate guidance of the kinesi therapeutic methods in the separate stages of the rehabilitation and give selective rating of the reached level of training.

THE IMPORTANCE OF THE CYRIAX PROFOUND TRANSVERSAL MASSAGE FOR THE RECOVERY OF THE SPORTSMEN WITH PATELLA TENDONITIS

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Introduction. The tendons injuries are common in sportive medicine and the patella ones are the most frequent in sports that imply jumping (athletics, volleyball, handball, basketball, football) due to the excessive solicitation of the tendon in the landing moment.

Objective. The purpose of our work is to emphasize the efficiency of the Cyriax profound transversal massage (CPTM) for the recovery treatment of the sportsmen with patella tendonitis.

Material and method. The study was made during 4 months, on 27 sportsmen (18M, 9F), ages 15-35 years, diagnosed with patella tendonitis. The patients had been evaluated etiopathogenetical dinical, functional and paraclinical using screening laboratory tests, radiological exam, echography, before and after the recovery treatment. To evaluate and quantify the results, we used the analog visual scale for pain. The functional response was appreciated according to the Blazina dassification, modified by Roels and Martens. The results appreciation was made in accordance to the following criteria: - very good results: the sportsmen took again the sportive activity at the same level, without pain or other; negative effects; - good results: the sportsmen took again the sportive activity at the same level, with a slight warming up discomfort; - medium results: the sportsmen took again the sportive activity at an inferior level, with major negative effects; - unsatisfied results: the sportsmen can not take the sportive activity ever. After the first evaluation and the

establishing of the diagnosis, the sportsmen were divided in 2 groups: - group A (15 subjects) which benefit of the following therapeutic protocol: sportive repose, cryotherapy (3x20min/day), local and general non inflammation medication, ultrasound, non pain and relaxing electrotherapy, CPTM (6 cures x5 min), quadriceps passive and auto passive stretching (30s, 10x3 series/day), quadriceps tone up kinetotherapy; - group B (12 subjects) which benefit of the same therapeutic protocol except CPTM.

Results. The patients had been evaluated before and after 6 weeks from the beginning of treatment. The patients' distribution according to the functional response after the first evaluation was:

	Group A	Group B
Stage I	3	2
Stage II	2	4
Stage III bis	10	6

On the second evaluation (after the treatment), the results were:

	Group A	Group B
Very good results	8 cases (53,3 %)	1 case (8,3 %)
Good results	5 cases (33,3 %)	2 cases (16,6 %)
Medium results	2 cases (13,4 %)	6 cases (50 %)
Unsatisfied results	-	3 cases (25 %)

The results showed that all patients treated with CPTM presented an important decrease of the VAS, its score decreased from 4,43 to 1,17 after 7 days of treatment.

Conclusions. Associated with medicinal and physical therapy, CPTM proved to be an efficient recovery treatment, due to its non pain and relaxing effects that support the rehabilitation and sportive activity recommending for the sportsmen with patella tendonitis.

Key words : Cyriax profound transversal massage, rotulian tendonitis.

NEW APPROACHES IN MOVEMENT BIOMECHANICS –ACQUISITION AND ANALYSIS SYSTEMS APPLIED IN SPORT AND REHABILITATION

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Introduction. Physiopathological aspects related to growth, aging process and osteoarticular pathology, correlated with the overtraining process in sport, are of most interest for the health care. Awareness of these problems can help the development of new methods of evaluation and rehabilitation in human movement, with clinical applications, leading to limitations of social and economical costs in healthcare but also with impact in increasing performance in sport activities. At the present time, different methods in approaching and evaluation of movement are presented in the literature, but the choices are unilateral, without a common approach based on interdisciplinary researches which would help in obtaining of better and quicker results. For this reason, the present paper intends to present a new and complex system of acquisition and analysis of motion data with direct applications in sport and rehabilitation, utilised within the research programme CEEX-M-C2-2358/2006 entitled "Individualized management of mobility recovery of patients with neurological and orthopedic pathology using new methodologies for interdisciplinary research – MANMOBREC" coordinated by the University of Craiova.

Material and methods. The present study wishes to present the use and interpretation of plantar pressure measurement using the RSscan footscan systems. For this purpose we will briefly present the characteristics of this system, as a new and recent method in sport and rehabilitation. A metaanalysis of present studies regarding the relationships between gait biomechanics and prospective studies of trauma risk factors for the lower limb will be followed by presentation of our own results in using this device. We involved 20 patients (age range 5-10 years) suffering different neurological pathologies (PF group) and a control group of 10 healthy persons (same age) with no complaints and no pathology during examination (C group). The diagnosis of neurological pathologies was made by history and physical examination. Measurements were made on a 0,5 m footscan plate and calculations were made using the gait scientific software. Examinees were asked to walk barefoot at a self-selected speed along a 8 m walkway. A Footscan pressure plate (RSscan International, Belgium, 0,5 m x 0,4 m) was mounted in the middle of the walkway. Distribution of pressure between the medial and lateral part of the forefoot was evaluated. Balance between the medial and lateral part of the forefoot was calculated using formula $((M1+M2)-(M3+M4+M5))$. M is pressure under metatarsal joint 1 to 5. The mean value of stance phase and balance for both groups were calculated. Measurement were carried before and after rehabilitation or surgical treatment.

Results. This is a pilot study and it is planned to evaluate the treatment effect on walking in neurological pathologies by using the data measured by RSscan platform as an evaluation method of the progress. Also the study contributes in gaining data for this new method, as many universities work for that issue, available data in the literature being still a few. Extension of the research results were made by elaboration a data base available for all potential users. Correction in some cases will be made by using the Foot Advisor software.

Conclusions. As walking is a complex movement, the purpose of our study was to evaluate the lower limb biomechanics providing a reliable and representative reference dataset for plantar pressures measured at a 350 Hz frequency of data acquisition underneath weight-bearing anatomical areas for barefoot walking, offering a systematic method of collecting the information. We conclude that we attained this goal by using a semi-automat procedure, based on the geometry of the foot and a qualitative interpretation of pressure distribution on the footprint, which allows a reliable and repeatable matching of sub-areas underneath the sole to anatomical structures of the foot.

Key words: motion analysis, Rsscan pressure platform.

INJURIES IN SPORTS

MUSCLES INJURIES IN SPORTS

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Muscle injuries have attracted great attention in recent years because they are misunderstood and maltreated. They are common in sports. Muscle tears and strains comprise 4-15% of all injuries and along with contusion strain and bruising comprise 10-30%

Muscle injuries sustained in sport are essentially no different from those sustained in other activities but the degree of damage, particularly secondary damage such as haemorrhage and haematoma formation may be greater in athlete exercising tissue that is metabolically more active than in tissue at rest.

They are produced by extrinsic trauma and intrinsic trauma and the predisposing factors are immobilization, muscle imbalance, inadequate fitness, inadequate warm up and inadequate warm down-post exercises stretching.

There are three degrees of muscle strain. In first degree strain there is some discomfort during movement. In second degree the muscle contraction is impossible because of pain and in third degree strain there is lack of functional capacity of the muscle.

For the treatment we must use both mobilization and immobilization. The principles of treatment in the first 2-3 days are ice, compression, immobilization, protection, unloading, elevation and rest.

The aim of treatment in the first 2-3 days is to stop bleeding, minimize oedema, prevent further injury, minimize loss of function and to promote healing. In these days we must avoid repeated trauma, massage, heat, ultrasound, cortisone injections and active stretching.

The treatment after 2-3 days includes: Early mobilization and several types of muscle exercises. We apply surgical treatment in large intramuscular haematomas, 3rd degree strain or tear and in 2nd degree when up to 50% of the muscle belly is torn.

A suture should be removed immediately and immobilization is required for 3-10 days

The athlete can return to sports when there is no pain during muscle exercises.

The complications of muscle injuries are compartment syndrome, myositis ossificans, old muscle tear and chronic muscle and tendon strain

The evaluation of the prognosis depends on the type of injury, the treatment time, the healing time and the value of laboratory tests (CPK, SGOT, SGPT, LDH, Mb)

In conclusion, we can say that muscle injuries are common in sports, the knowledge for treatment is limited, they must be treated seriously and they must be prevented by warming up, stretching, flexibility and training.

BONE BRUISE AND KISSING CONTUSION IN THE ACUTELY INJURED KNEE

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The bone bruise and bone contusion is a finding substantiated by MRI studies. This entity is recognized as focal signal abnormality in the subchondral bone marrow and the appearances are thought to represent microtrabecular fractures, haemorrhage and oedema of the marrow without disruption of the adjacent cortices or overlying articular cartilage. Unlike a fracture, the bone contusion rarely involves both cancellous and compact cortical bone. These osseous injuries may result from a direct blow to the bone, or compression forces of adjacent bones impacting one another, or traction forces that occur during an avulsion injury. In the literature the terms "bone contusion", "bone bruise" and "bone marrow oedema" have been known for at least a decade and seem to be used synonymously. The MRI sensitivity and specificity for bone contusion is reported to be 91-96% and 86-96% respectively.

Regarding the frequency of bone contusion Binfield and Williams reported 4% in the immature knee, Bretlau et al reported 65% in the acutely injured knee and Perrin et al reported 58% associated with more serious injuries (meniscal tears, ligaments tears). Bone contusions in both surfaces of the knee (kissing contusion) are rather rare complex injuries of the knee and their importance has not been well established. These characteristic lesions that occur both on the femoral and tibial condyle are of great importance, not only in that they are frequently a sign of more serious associated injury, but also because they may account for clinical lengthy symptoms.

MOST COMMON KNEE INJURIES IN SPORT

Valentin Matev
Bulgaria

The author presents the most common knee injuries which he has treated in his 20 year old practice. He reveals briefly the clinical anatomy of the knee. He introduces the most common clinical check tests. He pays attention to the methods of the knee investigation. He shares his experience about his patients, treated conservatively and operatively. He describes the most common type of injuries and surgical procedures. The author marks the importance of the rehabilitation treatment and the exact postoperative training process. He directs his attention to the difference in the recovery process in top athletes.

MR IMAGING OF OSTEITIS PUBIS IN ATHLETES

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Osteitis pubis is an inflammatory process of the symphysis pubis. Spinelli first described this entity in athletes in 1932. Osteitis pubis involves the athletes participating in football, rugby, tennis, and ice hockey. This condition is frequently associated with recurrent stretching and tearing of the stabilizing anterior ligaments and adductor muscles. Pathologically, the articular surface is irregular, with sclerosis, erosions and osteophytes. The fibrocartilaginous disk is degenerated and herniation of the disk is a frequent finding. Microtears of the adductor attachments occur especially in football players. The athletes present pain in the adductor muscles, in the symphysis pubis and lower abdominal muscles. Pubalgia is responsible for 2-5% of all sports injuries. The condition has an important effect on the competitive performance of the athletes as well as on the economical situation of the sporting organizations. The diagnosis is usually delayed because of the non-specific clinical findings. The final diagnosis is based on the physical examination combined with different imaging modalities. Radiography, ultrasound, bone scan and MR imaging are used for the evaluation of these patients. Although, the clinical examination is still considered the standard of reference for diagnosis, MR imaging is the imaging method of choice in evaluation of osteitis pubis. MRI enables to detect the presence of bone marrow edema of the articular surfaces together with the disk pathological changes (e.g. degeneration, herniation). Moreover, MRI is capable to assess both muscular changing and attachments tears. A correct and early diagnosis is of utmost importance in athletes with pubalgia since the return of the athletes in competition highly depends on the treatment and management of this condition.

MR ARTHROGRAPHY TECHNIQUE AND CLINICAL INDICATIONS

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Direct magnetic resonance (MR) arthrography consists of direct injection of diluted gadolinium in the joints. The technique is used mostly for evaluating certain pathologic conditions of the shoulder and hip. During the MR arthrography of the shoulder, the joint is in a neutral position and is punctured with a 21-gauge spinal needle under fluoroscopic guidance. Approximately 1-2 mL of contrast medium is injected under fluoroscopic guidance for confirmation of the intraarticular location of the needle tip and is followed by slow injection of 15-20 mL of diluted MR contrast medium. MR arthrography of the shoulder is indicated in patients with suspected labral tears, shoulder instability, loose bodies. Practically, at this moment more than 90% of the shoulder MR examinations in clinical practice are performed with this technique. For MR arthrography of the hip a direct anterior or anterolateral approach to the hip is used. A small amount of iodinated contrast material is injected to document intraarticular needle position. Once the intraarticular position is fluoroscopically confirmed, 8-15 mL of dilute solution of gadopentetate dimeglumine is injected. MR arthrography may depict intraarticular loose bodies, osteochondral abnormalities, and abnormalities of the supporting soft-tissue structures.

SPORTS INJURIES IN CHILDHOOD. A PROSPECTIVE STUDY IN GREECE

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Purpose. In this study, we present data on the occurrence of sports injuries among children in Greece. The study indicates the importance of injury surveillance in describing the epidemiology of sports injuries and provides an estimate of the magnitude of sport injuries that take place annually in Greece.

Materials and methods. Data from the European Home and Leisure Accident Surveillance System (EHLASS) were collected from the participating hospitals during a 2-year period (2002-2003).

Results. Almost one-third of all injuries incurred in Greece among children are sports-related injuries. Football, probably because of its popularity, accounts for most of sports injuries. In football, boys account for more than 90% of injuries, while in basketball, they account about 65%. In volleyball and particularly gymnastics, the opposite pattern holds with girls being frequently overrepresented. The most common injuries are sprains and strains, fractures represent more than 14% of sport injuries. The significant increase of sports injuries is associated with a parallel rapid growth of organized and unorganized sports activities for children in Greece in recent years. Approximately 4% of the total sports injuries require hospitalization.

Conclusions. Sports activities reduce cardiovascular, morbidity and mortality, increase fitness and improve quality of life. Sports injuries represent the most important and the most direct adverse consequence of sports activities. The frequency and severity of sports injuries is a function of the popularity of each type of sport activity.

BASKETBALL INJURIES AMONG CHILDREN

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The purpose of this study is to evaluate the incidence and mechanisms of injury in basketball and to recommend prophylactic measures.

Materials and Methods. We undertook a prospective study to determine the type and distribution of basketball injuries. During the 7-year period 1998-2004, 7134 injuries were collected by the Emergency Department Injury Surveillance System from Aglaia Kyriakou Children's Hospital. The data were collected and recorded on a pre-coded questionnaire. Cross-tabulations and multiple logistic regressions were performed to analyze the data.

Results. By the elements of study it is accounted that 1 in 100 children aged 5 to 14 years old in Greece, visits each year the Emergency Department of a hospital after an injury in basketball. The 44% of injuries happened during school activity, 22% in a game or training of team and 34% during leisure. The majority of injuries are reported was result of being struck by the ball 44%. Although the most frequent injury was strains 46% the percentages of fractures and sprains were particularly high. The commonest injuries among players 42% concerned fingers of hand. Injuries in ankle and knee were increased in organised basketball 21% and 6% respectively. Injuries during the game or training were very serious by 50% needed extra medical care. The percentage of hospitalisations was 2%.

Conclusions. The following safety precautions as warming up, good technique and use of protective equipment can help prevent basketball injuries.

DESCRIPTIVE EPIDEMIOLOGICAL STUDY OF INJURIES IN YOUNG BASKETBALL PLAYERS

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Introduction. There are not enough studies about teenage male basketball population. Difficulty is to compare existing information because of non consistent sports injuries statistics. Aim of this study was to identify the basic epidemiology of injuries during training and competition: 1) quantify basic measures of incidence: incidence rate and the epidemiological incidence proportion; 2) describe injury characteristics 3) compare injuries during training and competition; 4) identify injury prevention initiatives.

Material/methods. All injuries have monitored in four selections of one basketball team in Serbia during nine months period. The participants were 61 boys aged from 13 to 19. The 95% confidence intervals were calculated for rate and rate ratio using standard formulas.

Results. A total of 50 acute and 18 overuse injuries have been reported. Incidence rate of acute and overuse injuries have been 1.26/1000h exposure and 0.45/1000h exposure, respectively. The overall incidence rate was 1.72/1000h exposure [95% CI: 1.31-2.13]. The epidemiological incidence proportion of injury was 61% [95% CI: 49%-73%], and re-injury was 41% [95% CI: 25%-57%]. The lower extremities injuries were 69.1% of all. Ankle injury have been the most common overall (19.1%) then with the same percentage were knee (13.2%) and foot (13.2%) injuries.

Conclusion. We found that injury rate incidence in young basketball players is not high, although there is not enough available information in the literature to compare with. The most common injured region is ankle. Regarding that prevention strategy could be joint specific stabilizations and proprioception training.

Key words: sports injury, children, basketball.

A PRELIMINARY ASSESSMENT OF TEAM SPORTS ATHLETE'S AWARENESS OF INJURY PREVENTION STRATEGIES

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Introduction. The Purpose of this study was a preliminary assessment of team sports athletes' awareness of injury prevention strategies.

Method. Present research method is descriptive and survey. The research society is included all men athletes students who participate in team sports in 8th sport-student Olympiad. The sampling design is randomize. The sample is included 280 people between these people. The instrument for collecting information is the questionnaire which was done by the researcher. For data analysis inferential statistic (t- test and ANOVA) and descriptive statistic is used.

Results. The weakest awareness four team sport (handball, basketball, volleyball and football) is relate to diet suggestion before and after competition training. Also, the weakest performance is related to cooling down after competition and weakly training of flexibility and strength in form of team or single training. The correlation between athletes awareness and performance of injury prevention strategies in four sports team is (0/44) ($p \leq 0/01$). The ranking of injury mechanism in four sports shows the injury potential in handball, basketball and volleyball at the time of landing on one foot and in football at the time of tackling. Also, ranking of injury sports on the body shows that the most injury potential in four sports is considered to ankle and knee.

Conclusion. There are major problems in awareness and performance of athletes in respect to prevention of injury. These problems are more specific using protective equipments, cooling down, flexibility and strength training and dietary habits of athlete, before and after physical training. The correlation between awareness and performance in athletes shows that the more awareness of injury prevention strategies, the more performance and reversal. Actually, if athletes awareness of injury prevention strategies. Increases, a lot of problems in peripheral due to injuries like being away of sports events and injury treatment cost will reduce. Also it is important to concentrate on injury prevention strategies in respect to injury mechanisms in handball, basketball and volleyball in landing after jumping, in football in tackling and in regard body parts respect to injury marks and injury factors in ankle and knee.

Key words: injury, awareness, team sports, injury mechanism, prevention strategies.

THE COMPARE OF PREVALENCE, CAUSES AND CONSEQUENCES OF SPORT INJURIES IN ELITE AND AMATEUR MOUNTAIN CLIMBERS

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Introduction. The purpose of this study was the compare of prevalence, causes and consequences of sport injuries in elite and amateur mountain climbers.

Method. In this study 50 male mountaineers who were invited to Iran National Team with two years experience in climbing had been considered as elite. 52 male mountaineers who were climbing in "Payam-Zardkooh" and "Faraz" climbing groups with two years experience in climbing were considered as amateur. A questionnaire was used by the researcher to collect data via interview and participating in their climbing programs.

Results. 259 injuries were recorded in elite climbers and 998 injuries in amateur groups. The majority of prevalence of injuries was in soft tissue with 84% and 90% respectively for elite and amateur climbers. Sunburn, foot blister and muscle cramp for amateur climbers and sunburn, foot blister and frostbite for elite climbers were the most recorded injuries. The majority of injuries occurred at day time, while the higher percentage belong to lower extremities in the down hill tracks. In the most cases first aid kits were available for the both groups.

Conclusion. Lack of equipment and/or improper use of them were the most causes of injuries. Among them, lack of sun-cream and cap uses were the most importance causes. Inappropriate shoes and exhaustion among elite climbers and inadequate level of physical fitness in amateur were other causes on injuries. Chi square test showed significant differences among injuries between the elite and amateur mountain climbers.

Key words: injuries, elite, amateur, mountain climbers.

CONCLUSION. There is not correlation between ankle edema and range of movement, but there is correlation between pain and range of movement of the ankle.

ULTRASOUND IMAGING OF THE KNEE IN SPORTS TRAUMATOLOGY

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The post-traumatic knee represents a pathology frequently met in sports. Being a weight-bearing joint with important role in locomotion biomechanics, the knee's trauma pose complex problems for recovery. Exploration of soft tissues using ultrasounds (echography) acquisition represents a very useful tool for diagnosis of trauma through sports as it offers information about certain muscles, tendons, bursa serosa.

In case of muscles' trauma, the physician relies on echography for the differential diagnosis in an early stage, the aim being to distinguish between accidents with injuries and accidents of purely metabolic type. Further examination allows courts to adverse developments, highlighting the organization of blood collection or vidous healing. In the tendinous pathology, echography brings informations about tendon's intimate structure, in some cases even before clinical and radiological examination may reveal any changes.

In the exploration of cysts and bursa serosa, echography highlights perfectly the popliteal cysts and especially the serosa bursa which are independent and not connected with the joint.

However echography has limits especially in regards to viewing meniscus and cruciate ligaments, but even in these cases it remains useful for differential diagnosis of the lesion, before the call to other imaging explorations (computed tomography, nuclear magnetic resonance).

In condusion, echography represents a first choice examination for lesional diagnosis of post-traumatic knee. It allows in many situations to establish a precise diagnosis and in other cases facilitates the monitoring and tracing the evolution of certain complications. Consequently the physician may propose a more effective treatment.

Key words: echography, knee, sports, trautrmatology

HIP AND GROIN INJURIES IN TOP ATHLETES

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INTRODUCTION. As a major weight-bearing joint, normal hip function is crucial to favourable sporting participation being important in running, jumping and kicking based activities. Although athletic injuries of the hip and groin occur less commonly than injuries of the extremities, they represent a challenge for sports medicine practitioners because clinical assessment of the athletes is often difficult, because of the complex regional anatomy and of multiple differential diagnostic possibilities. Moreover, many of the soft tissue complaints in this area become chronic resulting in extensive rehabilitation time.

The aim of this study was to examine the incidence of posttraumatic injuries of the hip and groin in athletes registered at Dinamo Sports Club between 2005-2007.

METHODS: We have examined 109 posttraumatic hip and groin injuries (88 males and 21 female, aged between 8-35 years), representing 2,1% of all the medical exams. The athletes were assessed clinically and imaginatively (X ray, ultrasound, CT scan and MRI).

RESULTS: Most of the injuries involved the extra-articular soft tissue of the hip – 99 (90,8%) cases followed by a few cases of referred pain -9 (8,2%) cases (radiculopathies and sacroiliac dysfunctions) and only one intraarticular problem, a pincer-type femoroacetabular impingement. The distribution on sports discipline placed on top handball (23 cases) and rugby (29 cases) followed by athletics (15 cases), basketball and water-polo (9cases each), martial arts (5 cases), gymnastics and volleyball (4 cases each) and weight-lifting (2 cases).

CONCLUSIONS: 1. Extraarticular disorders of the hip far outnumber intraarticular disorders. 2. As expected, the most common injuries about the hip and groin were muscle strains, especially at the superior insertion of the adductor muscles and in athletes who participate in sports that require repetitive twisting and turning movements at speed (handball and rugby). 3. Often referred pain was responsible for hip and groin pain requiring a comprehensive medical exam. 4. Although intraarticular disorders of the hip are less common, they put problems in establishing the diagnosis and they severely hinder athletic performance. 5. Most of the cases of groin pain appeared/reappeared in a team in the same time during the competitive season meaning that the athletes were all subjected to inadequate trainings. 6. Preventive training, with specially designed strength and flexibility exercises, is essential and should be included in every training programme as an integral part of the warm-up.

KEY WORDS: hip injuries, groin injuries, top athletes.

INJURY PREVENTION IN CHILDREN ON TRAMPOLINES

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Recent research highlights a dramatic increase in the number of injuries related to the recreational use of trampolines by children. Our aim was to determine the nature of injuries presenting to a typical district general hospital in the UK and the orthopaedic intervention required.

We performed a prospective study of children who attended the emergency department over the summer period May-September 2007 after sustaining a trampoline related injury. Data collection was from case notes and a questionnaire given to parents. Out of 54 children studied (aged 2-13), 33/54 (61%) were boys and 21 (39%) girls. 92% of trampolines used were between 10-14 feet in size and 90% of injuries occurred in the back garden. Most of the injuries were sustained whilst jumping on the trampoline with more than 1 person 33/54 (70.37%). 18 (33.33%) of trampolines were enclosed and 37 (68%) of the children were supervised with 70% of parents stating awareness of the dangers. The commonest injury was ankle sprain 12/54 (22%). 11 children required admission to hospital and injuries that required further treatment were 5 distal radius fractures and 6 forearm fractures. 7 required manipulation under anaesthesia, 1 required plating, and 2 forearm fractures requiring intra-medullary nailing. There were no deaths, head or spine injuries.

Our study shows that although a proportion of children may suffer injuries requiring an operative procedure, better preventative measures such as parent supervision, single person jumping and enclosures appear to have resulted in less severe injuries compared to reports from previous studies.

Key words: trampoline, children, injury prevention.

MUSCULO-SKELETAL INJURIES TO UNSUPERVISED FITNESS ACTIVITY

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Introduction. Daily exercise is not a routine. For those dedicated it is a way of life and methodology of practice is well settled. Whether it is indoor or outdoor, in absence of a supervised control fitness amateurs are exposed to high injury risks, many of them with functional and psychological consequences.

Methods. Information regarding the aim, sport activity and training modalities have been requested. Clinic x-rays and imagistic evaluation settled the diagnosis.

Results. Patients, mostly male (76.19 %), median age (24.1 years), prominent sports: basket ball, football, with weight training, aerobic dance, bicycling; training aim: leisure and pleasure (14 patients => 33.33%), body remodeling and weight loss (28 patients => 66.66%); mostly affected: ankle,

Achilles tendon, knee, shoulder, rotator cuff muscles, cervical and lumbar spine; after recovery only 19 patients can continue the same sport activity.

Conclusions. Regular exercise is a critical part of staying healthy. The key is to find the right exercise for everyone. Injuries can be prevented with controlled proper conditioning and training wearing appropriate protective gear and using the correct equipment.

Key words: fitness, injuries, controlled training.

INJURIES AT BREAKDANCERS

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Introduction. Many youngsters choose dance as a sport activity. Despite the risk of accidents, break-dance is a favorite because of the mastership it requires and the spectacular result. Injuries are common and often severe.

Materials, Methods. 11 break-dancers, members of a hip-hop club have been assessed. They followed a general clinic and locomotor evaluation; pain and dysfunction were recorded. If necessary, the subjects have been x-rayed and imagistic evaluated.

Results. The biological state was proper, considering sport performances, at all subjects; localized pain: at wrist - 8 subjects (72.72%), cervical spine - 7 subjects (63.63%), lumbar spine - 3 subjects (27.27%), recognized training or competitive activity injury - 5 subjects (45.45%). Fractures identified with X-ray assessment at: cervical spine - 1 subject (9.09%), carpal bones - 5 subjects (45.45%). None of the dancers used any medical aid at all.

Conclusion. Learning how to break-dance represents a challenge, requiring however special attention and measures of precaution. To avoid injuries, it would be necessary to expand the specialized controlled training to amateurs and professional dancers.

Key words: break-dance, injuries, controlled training.

DELAYED ONSET MUSCLE SORENESS

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DOMS (Delayed Onset Muscle Soreness) occurs frequently in sport. DOMS usually develops 12-48h after intensive and/or unusual eccentric muscle action. They can be associated with decreased proprioception and range of motion, as well as maximal strength. DOMS disappears 2-10 days before complete functional recovery. Inflammation appears to be the most common explanation. DOMS should not be considered as an indicator of muscle damage but, rather, a sign of the regenerative process, which is well known to contribute to increase muscle mass. If some treatments are well known to attenuate DOMS, none has been demonstrated to accelerate either structural or functional recovery.

PROPHYLAXIS OF KNEE OSTEOARTHRITIS IN YOUNG FORMER SPORTSMEN

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We had in our clinical observations a group of young adults under 30 years old, who practiced different sports (athletics, running, ski, basketball, handball, football, gymnastics, tennis, bodybuilding, martial arts) during childhood and/or teenage, now presenting osteoarthritis-like symptomatology of the knee. Therapy with analgesics and/or nonsteroidal anti-inflammatory drugs were not efficient and physiotherapy was slightly helpful in some patients.

Based on our hypothesis that there is a pre-arthritis state due to micro-lesions (infra-dinical) of the cartilage sustaining a repeated and intense effort during different sports, we recommended a combination of chondroitin 1200 mg and glucosamine 1500 mg divided in 2 doses daily (Yogaflex – Ambrosia Bioscience). The osteoarthritis-like symptomatology (crunches, stiffness, pain) was resolved

within one month, but the therapy was continued for another month. The beneficial effect of SYSADOA was sustained for a period of 12 months. Until now we have no proof that some sports may trigger a premature osteoarthritis process, except the therapeutical evidence that an early treatment with SYSADOA is beneficial by improving rapidly and significantly the osteoarthritis-like symptomatology from our clinical and the patient's point of view.

In conclusion, an early therapy with SYSADOA might be a solution for the prophylaxis of knee osteoarthritis in young people after giving up sports. We intend to develop a long term study in order to monitor the effects of exercise on cartilage in the intact human joint in two situations: with physiologic loading conditions and with overloading during different sports.

Key words: SYSADOA, osteoarthritis, knee, sports.

THE STUDY OF RATE AND INCIDENCE OF SPORT INJURIES IN STUDENTS:
A 3.5 YEARS LONGITUDINAL FOLLOW UP STUDY

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INTRODUCTION. Musculoskeletal injuries as an unfavorable consequence of sport can be lead to of decreasing physical activities, increasing medical costs and disturbing of daily activities. **OBJECTIVES.** The purpose of this study was investigated the injury rate (number of injuries/ time in 1000) and incidence (number of injuries/ number of subjects in 1000) of sports injuries in P.E students in related to frequency and type of their sport class, competitions and recreational activities of them.

Methods. In a longitudinal follow up study 72 P.E student include male (n=28, age 21.64 ± 2.59) and female (n=43, age 20.26 ± 1.33) during 3.5 year period (7 semesters) were examined. All injuries of the subjects were recorded at the end of each semester .Friedman test was used to analyzed the data ($P \leq .05$).

RESULTS. 574 injuries were recorded (285 injury for male and 289 injury for female). Indence exposure of injuries was 832.12 in sport classes, 328.56 in competitions and 612.24 in recreational activities. Also the rate exposure was 282.67 in sport class and 187.49 in recreational sport activities. In a total the lower extremity with 45.4% (3.69 ± 17.4 injury per each subject), the upper extremity with 32.2 % (2.68 ± 2.58 per each subject), the trunk with 12.5% ($.86 \pm 1.33$ per each subject) and the head, face and other segments with 9.9% ($.94 \pm 2.76$ per each subject) showed most injuries. Importantly, most frequent injuries were showed in gymnastic class for females and in soccer class for males. There is significant difference between rate and type of injury and type of sport class ($P \leq .05$).

CONCLUSIONS. It can be concluded that high incidence and the varieties of sport injuries in related to some specific sport classes and risk factors emphasize on modifying of teaching style and educational program of P.E students

KEY WORDS: physical education, sport injury, injury rate.

CLINICAL ASSESSMENT OF ANTERIOR TIGH PAIN AT PERFORMANCE ATHLETES

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The anterior thigh is the site of lot of injuries at performance athletes; the most common causes of this pain are presented in table 1.

Table 1. Anterior thigh pain etiology

Cause of anterior thigh pain	Frequency
Contusion of quadriceps femori muscle	***
Strain of quadriceps femori muscle	***
Myositis ossificans of quadriceps femori muscle	***
Referred pain (from hip joint, sacroiliac joint, lumbar spine)	**
Strain of gracilis muscle	**
Strain of sartorius muscle	**
Femur stress fracture	**
Avulsion of the rectus femori apophysis	**
Perthes' disease	*
Tumor (osteosarcoma of the femur etc.)	*

*** - common; ** - less common; * - rare

The clinical assessment of this symptom is based, like in other pain syndromes, on history of pain, on clinical examination and other investigations. The anamnesis must determine the mechanism of a potential injury, the evolution of pain, the presence of other symptoms, the functionality of lower limb, the medical measures that have been applied before (PRICE, AINS medication etc.). The clinical examination elements which are important to put a correct diagnosis are presented in table 2.

Table 2. Steps of clinical examination in anterior thigh pain

Inspection	Standing, walking, supine
Palpation	Subcutaneous, muscular tissues
Functionality	Active movements: hip flexion, hip extension, knee flexion, knee extension
	Passive movements: hip flexion, hip extension, knee flexion, knee extension, stretching of anterior thigh muscles
	Resisted movements: knee extension, straight leg raises, hip flexion
	Functional test: squat, jump, hop, kick
	Special test: for femoral stress fracture, neural tension, lumbar spine, sacroiliac joint

Although, usually, anterior thigh pain does not require other paraclinical examinations, there are some investigations that may be done at these athletes: ultrasound, X-ray, isotopic bone scan or

MRI. Because the treatment protocols for the pathologies manifested with anterior thigh pain are different, all these steps must be respected carefully.
Key words: anterior thigh, pain, athletes.

IMPLEMENTATION OF STRATEGIES FOR PROGNOSIS OF TRAUMA RISK IN HIGH LEVEL VOLLEYBALL

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INTRODUCTION. Prevention, rehabilitation and training of the shoulder for athletes that use the overhead movement had suffered a lot of improvements in the last decade. Due to these progresses the athletes can return on the field much sooner than before. The background of these improvements consist in a better understanding of the shoulder complex from the anatomical point of view, taking into consideration the biomechanical aspects specific for different sports and development of the ability to transfer and integrate these informations aiming to improve sport performance. Even if in the literature are described extended researches in cinetics and kinematics in different sports, most of the studies were centered on baseball and only a few publications are focused on shoulder pathology in volleyball. For this reason the present research wish to identify the existent relationships between potential limiting factors, mainly traumatic issues, and the impact on sport performance.

AIMS. The research foccus on the determination of mechanical stress in the shoulder for the strike attack in volleyball, aiming to determinate the determinant-facilitating factors involved in overuse trauma mechanism, to elaborate and implementate a prophylactical programme included into the training session, finally leading to prevention of rotator cuff tendinitis and impingement syndrome in volleyball.

METHOD. The present study was carried on a group formed of 12 women volleyball players, medium age 22,3 years, height 173,5 cm and weight 63,45 kg, components of the team University of Craiova, during august 2006 and july 2007. We used the goniometric method and statistic methods for data standardisation (Student test, Anova and control test Newman-Keuls). Synthetising the obtained informations we had elaborate a prophylactical programme for prevention of rotator cuff tendinitis and impingement syndrome. Measurements were carried out before and after application of the programme.

RESULTS. A significant improvement of the amplitude of shoulder joint movements was found after application of the programme, internal rotation for the dominant limb increased with 12%. Medium values for muscular forces investigated increased with a value between 3% - 23%.

CONCLUSION. Improvement of the investigated parameters show the practical efficiency of the proposed programme leading to improvement of muscular and joint imbalance.

KEY WORDS: prophylaxis, trauma risk, overuse, shoulder joint.

DECREASING THE TRAUMA RISK BY INTRODUCING TRAUMA PREVENTION STRATEGIES WITHIN THE SPORT TRAINING PROCESS

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INTRODUCTION. Different epidemiological researches showed that athletes involved in different sport activities are exposed to different types of injuries, based on unique/specific factors, directly related to each sport and athlete. Sports traumatology is different from general traumatology due to the existence of cases in which the extrinsic traumatic agent is missing (hyperfunctional pathology group). This pathology is located on locomotory level and represents different forms of local overuse. The present paper aims first to individualise the factors that can generate microtrauma and hyperfunctional pathologies in sportives and secondly on decreasing the trauma risk by introducing trauma prevention strategies within the sport training process. We considered that the key for decreasing the trauma incidence in high top athletes consists in reducing the trauma risk by elaboration of adequate and efficient prevention strategies and of optimal rehabilitation programmes.

MATERIALS AND METHOD. The subjects were selected from registered top level sportives in the Sport Polyclinic Craiova, that presented different microtrauma. The interested sports were: basketball, volleyball, tennis, long distance running. We studied a number of 68 subjects (medium age 26,5 years; 35 man and 33 women) from which we selected 23 (; 12 man and 11 women) with microtraumatic lesions and hyperfunctional pathologies, developed after previous trauma. For all the subjects we analysed the trauma incidence for a period of 2 years. For identified pathologies we initiated and followed prophylactical kinetic programmes adressed to main interested joints: the shoulder and knee. We conceived a model of kinetic exercises, by which we tried to improve the muscular training for the lower and upper limbs, and in the same time, by keeping the homogeneity of the players group, without injuries, to optimise the technical and tactical competitional output. The proposed model applied for a period of one year macrocycle, choosing, grouping and dosing of means and methods was realised in direct connexion with the periodicity of trainings and the mean followed objectives. Goniometric, dynamometric, kinetic and cinematic tests were carried before and after application of the kinetic programmes in order to re-evaluate the initial recorded parameter

RESULTS. Most of the microtrauma registered were from the overuse and chronic group, developed after previous traumatism. We found acute ligamentitis; acute tendinitis, mostly localised at knee ligaments, tendon of brachial biceps, rotator cuff (volleyball), achilian tendon; chronic and dismetabolic pathologies (11.3%), most frequently periarthritis scapulo-humeralis, spondilosis, effort lombalgies. Application of the preventional programme adressed to the shoulder pathology leaded to an improvement of scapular and palm force index, final testing showing a progress of 11% and respectively of 16% comparing to initial testing and to an improvement of the amplitude of joint movement of 17% for internal rotation in the dominant limb (scapulohumeral joint). Applications of the preventional programme adressed to patelar tendinitis, leaded to increases of medium forces of the main muscles involved in jumping during the strike attack, with a percentage between 11% and 25%, in the same time with decreases of the compression forces into the knee joint.

CONCLUSION. Most of registered microtrauma were from the overuse and chronic group, developed after previous trauma. We appreciate that these pathologie were developed as a result of a local lack of recovery/rehabilitation and/or external conditions. The added factors were represented by low vascularisation of these structures and low elasticity compared with other structures in the kinetic chain. Changes in biomechanics of movement or stopping the effort can lead to improvement of symptoms. Improvement of joint mobility and increases in muscular forces demonstrate the practical efficiency of the prophylactical proposed programme by equilibration of the muscular and joint imbalance.

KEY WORDS: prophylaxis, trauma risk, overuse, shoulder joint; knee joint

HIPOTHESES RELATED TO THE INVOLVEMENT OF THE PSYCHOLOGICAL FACTORS INTO SPORTS
TRAUMATOLOGY ETIOLOGY IN RUGBY

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One of the most important impediments in the sports performance is constituted by injuries, traumas with a repetitive or unexpected character, mostly in competition context. In the sports traumatology etiology there are known mechanic, biological, structural factors. The present study centers on the psychological characteristics or events as predictors for traumas. It can be observed that in the high-performance sports, the role of the psychological assistance becomes more and more important for the increase of the sports performance and that it is necessary that the athlete to be analyzed from an interdisciplinary point of view for aiming a fair evaluation and for an efficient behavior in order to avoid the eventual causes of the maladaptive effects for performance. Considering the premise of the existence of a certain mutual determinism between injuries and psychological factors, the base of the study is constituted by the analysis of some cases in rugby. The study's conclusions centers on generating some hypothesis related to the existence of a certain pattern in which it concerns the injuries' typology related to the specificity of the competition environment, to the stable characteristics of personality or to the traumatic events determinative for structure and function changes of the apparatus and systems involved into the specific sports activity.

Key-words: sports traumatology, injury etiology, psychological factors, traumatic psychological event.

ADVANTAGES FOLLOWING AN IMMEDIATE TREATMENT AFTER TRECROSS LIGAMENT SURGERY

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Due to the increasing number of people participating in highly demanded sports, like skiing, the number of trecross ligament injuries counts the 25%-30% of all knee lesions. (Paletta & Warren 1994). Through the last decades it has been noticed that people who take immediate surgery treatment returning to their normal functional activities within 4-6 months. This is achieved by quick heavy load moving treatment in conjunction with a full range motion and a strengthening program which emphasize on the graft protection. An additional advantage of an immediate treatment after surgery is the load of the cartilage through movement and pressure. Finally, under the treatment the reproduction of collagen it is increased and the bones and the soft tissue respond better and more naturally.

THE VALUE OF MICROFRACTURE IN CARTILAGE LESIONS, III AND IV DEGREE

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INTRODUCTION. The cartilage lesions are after the capsule- ligamentary and meniscal lesions one of the most common and often meet knee injuries. If for the first two injuries the surgical treatment offers many possibilities, for the cartilage lesions didn't exist until soon a satisfactory treatment. The experience of our collective points out a 75 % healing percentage of the grade III and IV condral lesions after the surgical microfracture treatment, followed by a viscous- elastic intraarticular treatment.

MATERIAL AND METHODS. In our clinic were treated in this manner 40 patients, 32 men and 8 women with good results. **RESULTS AND CONCLUSION.** After a follow up over a 6 month period 30 people had very good results -75%. In 6 cases in which after a period of 2-3 month a ligamentoplasty was performed we had the opportunity of a second look which showed the former good results. This reason is why we are optimistic especially because we have the global statistic which also shows a percentage of 70-80 % positive results.

CORRELATION BETWEEN EDEMA AND ANKLE RANGE OF MOTION AFTER ANKLE SPRAIN

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INTRODUCTION. The sprains are the commonest injury of the ankle. The main symptoms of acute ankle sprains are the pain, the swelling and the restricted range of movement of the ankle. The aim of this study is to evaluate the correlation between ankle edema and the range of movement of the ankle.

MATERIALS-METHODS. Nineteen young people, 14 men and 5 women, 17 to 32 years old, with acute grade I or grade II ankle sprain were evaluated. The treatment was common for all of them. It included intermittent cryotherapy and elevation for the first 3 days, and although bandage and rest for 10 days. The edema, the pain and the passive and active movement, were evaluated on the 1st, 3rd and 10th day following the injury. A tank was used for the pre and post treatment volumetric measurements; the VAScale was used for the evaluation of the pain and an expandable goniometer (Gollehon) for the movement of the ankle.

RESULTS. There was not found significant correlation between volume of ankle edema and active or passive range of movement. It was found correlation between pain and range of movement of the ankle.

CHRONIC DISEASE AND PHYSICAL ACTIVITY

RESISTANCE TRAINING FOR HEALTH

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Though aerobic activities have become an integral part of preventive medicine, attitude of medical community to the resistance exercise has been rather cautious. This applies namely to its utilization in middle aged and elderly population. The main concern was an augmented cardiovascular risk due to pronounced blood pressure response to strength exercise. However, evidence accumulated over the last decade has shown that blood pressure reaches dangerously high values only under special circumstances. These include resistance exercise performed with extreme weights, i.e. those close to 1RM, lifted by large muscle groups under involvement of Valsalva manoeuvre necessary to stabilize torso providing a firm base for contracting muscles. On the other hand, pressure response to resistance exercise performed with moderate weights (up to 70 % of 1RM) and avoiding Valsalva manoeuvres, does not differ substantially from the one occurring during common forms of aerobic exercise. Slightly more pronounced increase of diastolic pressure is considered as a positive response fostering coronary perfusion taking place in diastolic phase of a heart cycle. There is enough evidence that regular resistance training performed at even moderate intensities, i.e. with weight around 70 of % 1RM not only increases strength and power, but also positively affects lean body mass, resting metabolic rate, bone mineral density, insuline resistance and proprioceptive functions. These adaptation changes can be of preventive as well as therapeutic value in diabetes mellitus, obesity, cardiovascular disease, osteoarthritis, and osteoporosis. One can conclude that there is enough evidence to consider resistance exercise as safe and effective means, which can potentiate health promoting effect of aerobic activities even in middle aged and elderly population.

THERAPEUTIC EXERCISE IN HEALING

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Healing occurs through a bridge of tissue when the wound separation is small. This is healing by primary intention. Healing by secondary intention occurs by filling in the wound with new tissue from the sides and bottom when the separation is large. Exist three phases of healing: inflammation, proliferation, remodeling.

The problem is how and when we start the therapeutic exercises in healing? It need to understand the base of healing and application of therapeutic exercise components must to be carefully coordinated with the phases of healing. Therapeutic exercise must be administered appropriately without causing harm to the healing tissue if the rehabilitation program is to be successful. It is important to use exercises carefully and watch for adverse effects from the exercises.

THE ROLE OF KINETOPROPHYLAXY DURING THE ACTIVE BALNEARY SESSIONS

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Introduction. The modern industrialized society, technology, pollution and daily stress are continuous challenges for the 21st century man and for the modern medicine in its quest of finding new prophylactic methods to increase the human resistance against these aggressive factors and prevention of contemporary pathologies.

Desk-related work, physical activity restraint and unhealthy diet are causes for obesity and for the so-called „deconditioning syndrome” or „hypokinetic syndrome”, with long-term dysfunctions on the affected young-active adults: static and dynamic changes of spine and locomotor system (kyphosis, scoliosis, plantar arches collapses, weight-bearing joints mechanical changes), muscular hypotonia/hypotrophy, decreasing of effort capacity, metabolic changes, neuro-vegetative dysfunction and thermoregulation problems, etc.

Material and methods. This paper presents the advantages, the objectives and the methods of kinetoprofilaxy during the active balneary treatment with particularities depending upon the age and the functional level for each person, with a high individualization. Scientific studies proved the importance of sustained physical activity in maintenance of physiological parameters at normal values. That's the reason of including kinetoprohylaxy during the active balneary session, no matter of the methods – as medical exercises in the gym, in the pool, sport-loisir, walking in resort or in the surroundings, beneficiary of the whole natural therapeutic factors.

Results. These active balneary sessions, including individualized kinetoprohylaxy depending upon the age and sportive level, are highly recommended once a year for people under thirties and twice a year for the rest, as a maintenance therapy.

Conclusions. Kinetoprohylaxy as physical activity well-done, supervised, sustained and correctly monitored, is an important therapeutic agent for deconditioning syndrome, health-being promoting, increasing of active period of life and modern life-related diseases prevention.

Key-words: kinetoprohylaxy, deconditioning syndrome, active balneary session/treatment, effort capacity.

**MOVEMENT ANALYSIS SYSTEMS APPLIED IN REHABILITATION OF
WALKING FOR PATIENTS WITH NEUROLOGICAL DISORDERS**

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INTRODUCTION. Many scientific organizations from different areas pointed that in the following 10 years the scientific research will be focalized on osteoarticular pathology "The Bone and Joint Decade 2000-2010". In fact problems related to growth and aging process, osteoarticular and neurological pathology are of most interest on the health care impact in an economical and social point of view. Therefore one should note that the initial clinical problems are the same but different approaches are investigated due to the different disciplines to which researchers are belonging to. This approaching and evaluation modalities had been chosen individualized without existing a common tendency based on interdisciplinary research which would lead to the obtaining of more rapidly consolidated results. That is why the proposed research associates clinical functional data of the patient with neuromuscular pathology with computational analyzing movement programs for walking.

MATERIALS AND METHOD The present research is based on utilization of the newest computerized technologies, more accurate and efficient for data collection, that included dynamic measurements of specific cinematic parameters in walking by using image acquisition and movement analysis system 3D "Simi Motion"; dynamic measurements of specific cinematic parameters in walking by using the scanning and equilibrium system "RSSCAN and force platform Kistler "AMTI"; computerized modelling of the walking by using the "AnyBody" system. Measurements were performed on a study group formed by 20 patients aged 5-10 years with different neurological pathologies that were hospitalized in Emergency Clinical Hospital M.S. Curie and on a control group formed by 10 healthy subjects of the same age. The research was carried out within the project CEEX -M-C2-2358/2006- "Individualized management of mobility recovery of patients with neurological and orthopedic pathology with the help of some methodology for interdisciplinary research - MANMOBREC".

RESULTS. The data initially obtained by SIMI, RSSCAN and AMTI were used as input data for the Anybody system. Due to this software we calculated the muscular forces, reactional and joint moments, reconstructing the movement for the implemented models by using the markers coordinates and the values of the contact pressure and forces for the weight center. Based on recorded data biomechanical models of walking, individualised for each patient, were elaborated.

CONCLUSION. The present study offers a dynamic approach of the biosystems involved in human movement, arguing the importance of the accuracy in using computerized non-invasive techniques for analyzing the walking mechanism and elaboration of individualised biomechanical models. The creation of these models based on the objective results from the computational analysis of movement will help in choosing the most appropriate therapeutically intervention. Elaboration of methods of optimisation in neurological rehabilitation and /or treatment by image acquisition and analysis before and after treatment and of individualized rehabilitation programs in order to regain mobility with pursuit and computational correction will lead to better management of the disease. Extension of the research results can be made by elaboration a data base available for all potential users.

Key words: walking rehabilitation, neurological disorders, RSScan footscan systems, force plate AMTI, ANYBODY software.

SURVEY EFFECTS OF THREE DIFFERENT METHODS MODALITIES ON THE PATIENTS REHABILITATION OF LOW BACK PAIN

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The aim of present research is to determine the effects of three different treatment methods on rehabilitation of patient with low back pain. In this research, 120 patients with chronic low back pain (having at least 3-m history of low back pain) were selected as statistical sample and treated after passing the stages of screening with x-ray, MRI and medical examination. The level of patient's pain (by using Quebec Back Pain Disability Scale) as well as the range of motion on lumbar area measure during pre-test period. Then patients were randomly placed in one of treatment groups: selected treatment method (group 1; n=40); Williams exercise (group 2; n=40); McKenzie exercise (group 3; n=40). 10 weeks were considered as therapeutic course for all three groups. Post-test was performed at the end and 1-m after of treatment period. Following collection of primary information and determination of different variables, findings were analyzed statistically using tests of variance analysis (ANOVA), toky test, two dependent groups test (t-test), mann-whitney u, and kruskal-wallis H. Research finding show that some statistically significant differences in mitigating the level of pain and range of lumbar motion were observed with in three groups ($p \leq 0.01$).

Indicating that selected treatment method (group1) has better effects on mitigating the level of pain and increasing range of lumbar motion; so remaining treatment positive effects in this group (group 1) after 1- m was more than another groups ($p \leq 0.01$). Gender has no statistically significant effect on rehabilitating programs for patients with low back pain.

The conclusion of this research indicates that the complex treatment method especial exercises, hydrokinesiotherapy, massage therapy and physiotherapy has effective for treatment of low back pain patient.

Key words: chronic low back pain, exercise therapy, hydrokinesiotherapy, physiotherapy, Williams exercise, McKenzie exercise, rehabilitation.

THE STUDY OF CERVICAL CURVATURE IN FORWARD HEAD POSTURE (FHP)

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Since the neck supports head weight, it's abnormal positioning not only results in spoiled posture but also may be responsible for physical disabilities, abnormalities, and injuries. For the study of cervical curvature in forward head posture, some of Razi university's students selected randomly and screening with the use of PPV software, 14 students with forward head posture (with mean of 22 years old and 60 kg weight) and 14 healthy students (with mean of 22.8 years old and 62 kg weight) selected as subjects and with informed consent participated in following phase of research. In this descriptive study of cervical curvature, cervical spines radio graphed from lateral view and then evaluated for anterior head translation (AHT), cervical lordosis (C2-C7), and superior cervical curvature (C1-C2).

Mean differences of healthy and FHP subject's variables analyzed with independent t-test. For the analyzing of variables relationships, Pearson's coefficient of correlation used at $p < 0.05$.

Results showed that:

1. There were significant differences between cervical lordosis, anterior head translation, and amounts of overload on cervical spines among two groups. Differences of superior cervical curvature's amount were not significant.

2. FHP had significant relationships with AHT and cervical lordosis. A significant relationship also existed between AHT and amounts of overload on cervical spines. FHP and cervical curvatures were not significantly related. The weak relationship of cervical curvature and lordosis were not significant. The results revealed that extreme forward head position may cause a S-form curvature which is due to decreased inferior and increased superior cervical spine curvature. In this situation, in fact, inferior muscles of neck's anterior are shortened and superior portion of muscles is stretched. At the other hand, posterior inferior muscles of neck are stretched and in the extreme cases, superior muscles of neck are shortened. With these results it can be postulated that the forward head posture can cause a decrease in normal lordosis and occurrence of cervical kyphosis.

Key words: anterior head translation, cervical curvature, deformity, cervical spine.

THE EFFICIENCY OF THE THERAPEUTIC EXERCISE ON BALANCE, MOBILITY AND FEAR FELLING OF
FAILLING ON ELDERLY PEOPLE

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The instability, the reduced mobility and the fear- feeling of falling are deemed to be the most important factors that are seriously connected with the increased frequency of peoples' falls, both while standing and moving. This survey intends to study the results of a special- designed protocol of therapeutic exercises of the elderly, as it arises out of the review of the relevant bibliography and articles. The protocol was designed according to the exercises' principals and the special personal needs of the elderly and includes exercises that combines resistance exercises, flexibility, proprioceptive neuromuscular facilitation, balancing and other diverse mobility and functional activities which have as target to rehabilitate and prevent these peoples' falls. The consistence of the surveys' sample was 40 65-85- year- old people with an antecedent of falling in the past year. These falls were registered in the outpatients department of the General Hospital in Kilkis. As to collect and evaluate the data of the mobility- therapy program we used the functional- balance- scale Berg, the mobility- test Tinetti and the Modified Falls Efficacy Scale. The results arising out of this survey showed a statistically improvement of the persons' balance and mobility, but no differentiation in the fear- feeling of falling.

Conclusively, the specific protocol of therapeutic exercises can be used as to improve the balance and the mobility of the elderly. As far as it concerns the reduction of the fear of falling, it may be necessary to support these people on a psychological base.

KEY WORDS: exercise, the elderly, balance, mobility, fear of falling.

THE EFFECTS OF PHYSICAL EXERCISE IN THE PREVENTION AND
TREATMENT OF METABOLIC SYNDROME

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Metabolic syndrome is characterized by the presence of obesity, hypertension, insulin resistance, glucose intolerance and dyslipidemia. Lack of physical exercise and excess caloric intake lead to an imbalance between free fatty acid uptake, lipid storage, and fatty acid oxidation resulting in a progressive intramuscular accumulation of both lipids and fatty acid metabolites, which could cause abnormal insulin signaling, leading to skeletal muscle insulin resistance. This excess lipid deposits are prone to enhanced lipid peroxidation, which could also lead to the development and/or progression of skeletal muscle insulin resistance by increasing tumor necrosis factor - and/or by inducing mitochondrial damage.

The most efficacious treatments and the only effective approaches to preventing the metabolic syndrome are aimed at the underlying risk factors of obesity, physical inactivity, and atherogenic diet. The researches of the last years have implied the necessity of association in the management of metabolic syndrome, the reduction of body weight with the systematic appliance of physical exercise programs. The most important effects of physical exercise on the metabolic syndromes different manifestations are: improvement of skeletal muscle insulin sensitivity and insulin resistance, depletion of both intramuscular lipids and glycogen content, an improvement of the endothelial function by preserving nitric oxide availability, an reduction of the peripheral markers of inflammation etc.

KEY WORDS: metabolic syndrome, management, physical exercise programs.

PHYSIOTHERAPY AND PARKINSON

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The Parkinson disease is most common on elderly people but lately has been also diagnosed in younger people. It is very important the family of the patient to have a complete update of the disease in order to provide the best possible leaving for the suffering person. Firstly, a quick diagnose of the symptoms and the way to solve them is critical. The physiotherapy plays a crucial role here in order the patient to feel more confident for himself. The motives, the personality, the attitude of the patient

and the therapist have a great perspective on the treatment. The quicker the response and earlier the treatment the better and more effective the treatment will be. If the treatment starts on a later stage, the memory of the patient, the cooperation with the therapist and the motives will be insufficient.

Workouts. The workouts and movements are very important on people with Parkinson disease. By working out the muscles and the joints correctly, we prevent the wrong position of the body and the inflexibility. In general, exercises aim to: improve walking, correct improper body position, prevention or reduction of the inflexibility and the muscle-joint contraction, better and more comfortable use of the involved parts.

Exercise program can be used by the patient in his house. Exercises vary according to the level of disability. One of the most valuable exercises is walking. By keeping the muscle tissue the patient puts less strain on his bone structure and also reduces inflexibility and contractions.

Most people with Parkinson disease are capable to walk around 1.5Km-3Km daily and sometimes even more. It is important to keep the body on an upright position, the shoulders and head straight and walk slowly with long steps. People with less flexibility are advised to walk around 270-360 meters once or twice a week. Slippery surfaces such as snow, ice, wet leaves are not recommended.

The physiotherapist will assist and teach the patient to sit properly on an upright position usually on a chair with long back and with the use of a pillow. The physiotherapist will show how to walk on the heels, how to move correctly from sitting to standing position using your heels and body. The use of a long mirror will help to practice the correct movements and positions of the body and neck.

CRANIOSACRAL TREATMENT

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Our body is characterized by a "harmony" of movements. The biggest challenge which is health, achieved when all the departments of body, are free to move in harmonious relation each other. The restriction of this continuous alternation of movement is responsible for a lot of pathological situations. The legitimate question is if there is a way to appreciate this functionalism, but also if we have the way to influence it?

The functionalism of Brain but also Spinal Marrow depends immediately from those functionalisms of all the manufactures that surrounds them (bones of skull, face, vertebrae, sacrum, intracranial membranes, vertebral temples, cerebrospinal liquid and whatever has relation with them). All these manufactures constitute Craniocerebral System. The role of this system is so much vital, that report the presence and the action of brain and spinal marrow, that the imbalance or the dysfunction it can cause in an individual person aesthetic, kinetic or neurological disturbances (e.g., chronic pain, headaches, migraines, lumbagos, coxalgia, ramex of mesovertebra disk, cervical syndrome, stress, insomnia, lassitude, bad digestion etc). Craniocerebral treatment is a bland treatment with handlings of weight 5gr, that is applied by suitably educated healer, in various points of body, mainly in the bones of skull, the face, in the vertebrae and sacrum, with purpose to appreciate but also to strengthen the functionalism of Craniocerebral of System.

More concretely it helps patients with: • craniocerebral lesion; • cerebral ischemic attack; • operating treatment or wounds in the vertebrae; • lumbago, coxalgia, ramex of mesovertebra disk;

• arthritis; • rheumatoid arthritis; • dysfunction due to stress (insomnia, syndrome of lassitude, bad digestion, headaches, etc); • Cervical Syndrome; • aesthetic disturbances (loss of flavour, rhinesthesia, buzz of ears, etc); • vertigo, migraines, headaches; • the application of technique with soft touch settled marvellous therapeutic approach to baby, newborn, or children with traumatic lesion, training difficulties, hyperkinetic etc.; • problems of temporal gnathic articulation; • palsy of facial nerve; • Syndrome whiplash; • chronic emphyrectic pulmonary disease; • neuralgias; • frozen shoulder; • Syndrome of Chronic pain; • depression, sentimental disturbances; • inflammations; • optical disturbances, e.g. nystagmous; • asthma; • hormonal disturbances; • problems in the pregnancy.

CERVICAL SYNDROME- PHYSIOTHERAPY

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With this term we mean the disease that it causes: pain in the region of nape or pain that radiates in the back between the scapulas, in the shoulders, the hands still up to the fingers of hands. The pain can be acute or chronic. Statistically the $\frac{3}{4}$ of adults at some time will present some form problem in the region of nape, while in the $\frac{1}{6}$ of cases the problem will be the chronic pain. The symptoms are pain and restriction of movement. Usually the pain subsides with the rest. Means of this mechanism are created also the Muscular Points Burn of Pain or Trigger Points. It's about supersensitive points inside the muscles that appears pain in regions of body removed from them, following certain concrete patterns. This happens because this region of vertebrae has big range of motion, this is the reason that is prone in direct wounds, as in the case abrupt or violent movement because road accident (whiplash syndrome), but also from extended bad attitude at the duration of work or entertainment, with result continuous tendency in the muscles and ligament of region. Then is caused muscular convulsion that in enough cases is accompanied by uncritical harm of muscles and ligaments of region with simultaneous change into the disposition of skeleton. We have in this case a musculoskeletal dysfunction. Re-establishment. The aims of this phase are to corroborate the Muscular System, to improved the functionalism of Vertebrae and complete the healing of wounded textus. The application of treatment continues. The frequency of treatment can become three times the week. It is completed with domestic exercises, directives of diet and effort of modification of daily occupations according to the needs of Vertebrae.

HIPPOTHERAPY IN CHILDREN'S WITH BRAIN PARALYSIS
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The word Hippotherapy means "treatment with the use of a horse". The Hippotherapist is a physiotherapist or an ergotherapist with additional training in horse movement.

In Hippotherapy the horse is used as a tool of treatment, like a moving machine, and the child on the horse as a patient and not as a rider. In our case the horse influences the rider, not the rider the horse. The Hippotherapy applies individually, with a physiotherapist or ergotherapist and the horse trainer who is responsible for the horse walking quality and movements.

The term Hippotherapy first used by the Germans in 1960 and in 1970 they first founded a center in order to train people how to use Hippotherapy. In 1976 a Swiss Hippotherapeutic team established in Basel. According to Professor Bauman of the Child Hospital in Basel, "the hippotherapy, practiced by therapists, is insuperable as a treatment in selected cases of brain paralysis".

There are two types of Hippotherapy: The classic Hippotherapy where the physiotherapist or ergotherapist place the patient on the horse, analyze his reactions and moves the horse in order to influence the patient and finally achieve his target; The developing Hippotherapy it is used as the classic one with the difference that the physiotherapist or ergotherapist helps the child to sit on a specific point and he is capable to ask or help the child to move within that certain point. The main goal is to make the rider to get used of the movement sitting on the horse back. The rider is instructed therapeutic from the horse and in no way is trying to influence it.

HYDROTHERAPY IN DISSEMINATION

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Dissemination is one of the most common neurological disorders. Is a disease that affects the Brain and the Spinal Marrow. In particular, the case that covers the nerves, called myelin, it is destroyed and the nerve is damaged. Myelin plays an important role on the nerve proper function and protection. Myelin delivers the nerve messages from the brain to the body. If the myelin and the nerve tissues are injured a body part will not be able to move. The same happens for senses moving from the body to the brain. As a result, movements will be slow or even unsynchronized. In addition we have loss of messages going to the brain. Some of the therapeutic advantages are the following: muscle relaxation; pain reduction; reduction of the muscle contractions and the convulsive movements; increase and ease of the motion range; reduction of the gravity forces; improvement of the lymph and round function; recovery festination and complication prevention; improvement of the neuromuscular commissural, patient independence and functional recovery.

Apart from the over mentioned advantages, the water plays an important role on the psychological side of the patient. The treatment in the water makes the patient to feel more confident, move with more ease and is more enjoyable. In order to achieve the best desirable result, the establishment of great collaboration between the patient and the therapist is crucial. Finally, the socialization level of the patient plays an important role in the overall treatment process.

IMPROVEMENT OF PATIENT'S SKELETAL MUSCLES WITH CONGESTIVE CARDIAC INSUFFICIENCY CL II-III NYHA BY PHYSICAL THERAPY'S METHODS

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Introduction. Congestive heart failure cl. II-III NYHA patients have an alteration of muscles mass caused by muscular force decrease, decrease of muscular mass with diminishing section area, increasing glycolysis and decreasing of oxidation enzyme's activities. Muscular fatigue during effort determines its interruption although cardiac or respiratory reserve isn't depleted.

Methods. The research took place on 40 patients with congestive heart failure cl. II-III NYHA, between 55- 60 years old. They followed a physical rehabilitation program for 2 months, 3 sessions/ week. We kept a look over the following parameters during the evaluation (initial and final): diameter of 1/3 inferior of the thigh measured with metric ribbon, effort capacity measured with 6 minutes walking test, and EMG value on thigh level with Biopac Student-Lab.

Results. The final results show an increasing in trophic and tonus status of lower limbs, as well as an increased effort capacity. The final results were much better than the initial ones.

Conclusions. With physical therapy program we can meaningfully diminish the alteration of skeletal muscles status. Key words: spondilolistesis, manipulation, rehabilitation.

THE EFFECT OF DISTRIBUTION OF PRACTICE TIME ON LEARNING AND MAINTENANCE ON A CONTINUOUS MOTOR SKILL

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The studies about the kind of training and its effects on performance and motor learning have a long history. The results were often opposable regarding the effectiveness of the different kinds of training. The aim of the study was to investigate the effects of the massed and the distributed practice on learning and on the maintenance of learning of a motor skill. The skill which was investigated was balance on a stability platform. The measurement was applied on three groups, each consisted of 3 healthy subjects (total n=9). Group A practiced in massed practice (100% practice without break), group B practiced in massed practice consisted of 60% practice time and 40% break time and group C practiced in distributed practice consisted of 40% practice time and 60% break time. According to the results there were no significant differences between the 3 groups regarding learning and maintenance of learning ($p=0.812$) whereas the group which was practiced in distributed practice presented an advantage comparatively to the other two groups. There was significant difference between initial and final measurement ($p=0.024$) in all groups and between initial and maintenance measurement ($p=0.007$) in all groups also. The results of this study confirm the general findings from previous studies that either massed or distributed practice have a positive contribution on motor learning, especially when it concerns continuous skills with low energy demands such as balance training.

KEY WORDS: performance, motor learning, massed practice, distributed practice, continuous skill, balance.

EFFICACY OF MOBILIZATIONS WITH MOVEMENT IN PATIENTS WITH KNEE OSTEOARTHRITIS

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INTRODUCTION. Knee osteoarthritis is a disabling disease affecting approximately 1% of the population. This study aims to establish whether mobilizations with movement (MWM) included in physiotherapy program, is effective in reducing pain and improving function in individuals diagnosed with knee osteoarthritis.

MATERIAL AND METHODS. 42 patients diagnosed by a physician as having knee OA were treated in NSA physiotherapy department, DKC and private practice between January 1999 and December 2007. Mean age of patients was 61.9 years. A lot of patients were former professional athletes. They had received an average of 16.9 treatments including ice/heat, relaxation techniques, and active exercises, strengthening program, education and dietary changes. The Mulligan method of applying a combination of manual therapy techniques while simultaneously performing an active or passive movement was tried on 24 patients (Group A) as addition to conventional physiotherapy treatment. Eighteen others (Group B) were given conventional physiotherapy treatment.

RESULTS. The statistical analyses were carried out using an SPSS package. The results showed initial objective improvements in the patients condition in 36 patients (85,71% of cases). Application of Mulligan's mobilizations with movement techniques in Group A produced immediate pain relief after first treatment procedures (between 1 and 5.5 cm on the visual analogue scale). The effects were sustained four weeks later. Pain relief was not evident in those treated conventionally. This study demonstrated that strengthening of knee musculature was more effective after the MWM and was associated with significant improvement ($p < 0.05$) in quadriceps strength and function, when compared with controls. As a result of treatment, 21 (87,5%) of the patients in Group A displayed a considerable increase (on the average by 10-15°) in knee range of motion and the average quadriceps strength ratio was 85% compared to healthy leg. At the six-month follow-up 19 (87,5%) of the patients in Group A had maintained improvement in stair climbing, level walking and sit-to-stand activities.

CONCLUSIONS. MWM have been found to be feasible and efficacious in individuals with knee osteoarthritis. The comparative analysis of two groups showed the original physiotherapy method to be more efficient than the conventional physiotherapy treatment. A high proportion of patients with moderate to severe knee joint disease may experience continued functional benefits from physiotherapy programme, despite the poor outlook often associated with the disease.

Key Words: osteoarthritis, knee, mobilizations with movement, physiotherapy.

CONTROL OF THE COMPENSATORY MECHANISMS BY PHYSIOTHERAPY AFTER SURGICAL STABILIZED PROXIMAL TIBIA FRACTURE

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An improved method of treatment of the proximal tibia fracture is a surgical stabilization. The early phase has to lead on adequate recovery of the patients by physiotherapy.

THE PURPOSE OF THIS STUDY is to present the developed physiotherapy program on the control of the compensatory mechanisms and muscle reactivation during the early phase after surgical stabilized proximal tibia fracture in soccer player.

Material and method. A male 42 years old patient was observed after proximal dextral lateral tibia fracture (type b1 regarding AO classification) during soccer play. The surgical stabilization was made in Austria in June 2008. The brace was used for the relative immobilization after the surgery for 30 days. The physiotherapy was directed to restore of the knee range motion, muscle reactivation and weight bearing by controlling the compensatory mechanisms. The unloaded exercises were performed with changing of the initial position in passive and active insufficiency.

RESULTS. The early post surgical results (10 days after surgery) show the knee range of motion for flexion 20° and extension -15° which progressed to flexion 115° and extension -5° after 3 weeks. The circumference data manifests to reduce the knee effusion but in being the muscle thigh hypotrophy. The weight bearing was improved with one crutch at doing the daily activities.

CONCLUSION. The precise physiotherapy leads to correct of the compensatory mechanisms and to progress the opportunely recovery of the patient after surgical stabilized proximal tibia fracture in soccer player.

Key words: compensatory mechanisms, physiotherapy, proximal tibia fracture.

REABILITY OF METHODS OF EVALUATION OF BALANCE IN CHILDREN WITH PALSY

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The evaluation of balance in children with cerebral palsy (CP) it is an extremely difficult and complex procedure. It is even more difficult the evaluation of the results of some therapeutical intervention to this kind of patients. Varied methods of balance evaluation are mentioned to the international bibliography, but almost none has not clinical utility and application in children with CP. The purpose of the present study was the application of three methods of evaluation of balance (BBS, TUG and BOTMP) in children with CP, as also their evaluation with regard to reliability. **METHODOLOGY.** The control of reliability of the tests was based on the successive application to twenty children with CP within the short period of one day and one week in order to substantiate their ability to give the same results in a stable sample (test-retest reliability). The statistical analysis was based upon the analysis variance in relation with two factors (two-way ANOVA), so as to establish if there is an important statistic differentiation to the performances of children in the each test, as well as the analysis variance in repeated measures (ANOVA repeated measures) for the control of the influence of each type of CP to the average of performances in each test.

RESULTS. No important statistic difference was found out in relation with the performance between the measures but important statistical differences were found of the performances of the children in all the three tests considering the type of their CP.

Conclusions: The tests BBS, TUG and BOTMP are considered to be reliable and valid tests, able to objectively define the quantitative mutation of the balance of the child in test with CP

KEY WORDS: balance, cerebral palsy, evaluation.

DIRECTIONS OF KINESITHERAPEUTICAL BEHAVIOUR FOR THE FUNCTIONAL RECOVERY AFTER SURGICAL TREATMENT OF TORACAL SCOLIOSIS

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The basic tasks of the surgical treatment of scoliosis are achieving of corrected more balanced spinal column that secures stability on the basis of minimum mobile segments included in the instrumentation. The goal of the present report is to give kinesiological ground of the kinesitherapeutical approach for overcoming muscle disbalance after surgical treatment of toracal scoliosis.

It had been traced the postoperative recovery of 11 patients (7 girls and 4 boys) at the age of 12,6 years, operated in USBALO "Prof. B. Boytchev" for the period of two years. Vertebrodesis with metal osteosintesis TSI was performed to all of the patients.

Analising the initial and final results of applying manual-muscle testing (MMT), testing for strength hardiness of the musdes and subjective assessment of the pain on 10 grade Maytland's scale the authors kinesilogically explain their thesis of necessity of training muscle stabilazors and depressors of the scapules bilaterally. The authors arrived at the conclusion that the accent of the kinesitherapy should be placed on the balanced recovery of the hardiness and strength of the muscles. This gives the possibility of relining of the scapuls to their normal position and overcoming the consequences from surgical intervention and future immobilization.

In condusion the authors put an accent on therapeutical possibilities of kinesitherapeutil methods as an addition to surgical treatment for solving one difficult medical problem.

**OSTEOARTHRITIS TREATMENT TO ATHLETES
– A REVIEW OF THE RECENT LITERATURE REGARDING THE SLOW ACTING DRUGS**

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BACKGROUND. Osteoarthritis is a major social and medical problem by its incidence and consequent functional deficit. Incidence of the disease varies from 7% to men and 2% to women of 18-24 years of age to 100% to old people in their 80's.

METHODS. A review of the last ten years specific literature shows the latest news regarding the role and action of the nutraceuticals (glucosaminoglicans and chondroitinsulphate) as a part of the therapeutic EULAR protocol of osteoarthritis. A meta-analysis made by JAMA in 2000 evaluates the studies published between 1966 and 1999 selected only 15 studies rigorously written.

RESULTS. The studies presented are a strong evidence for the therapeutical efficacy, well defined joint protection role and very low side effects of the dietary supplements mentioned above.

CONCLUSION. Glucosaminoglicans and chondroitinsulphate are safe and officially included in the therapeutical protocol for osteoarthritis

COMPARATIVE ANALYSIS OF DOWN'S SYNDROME AND AUTISM CICLICAL MOVEMENTS

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The study aim was to compare kinematics and muscles activity of normal gait and swimming exercises and those of subjects with Down's syndrome and Autism. An original video-computer methodology was used to estimate kinematics and modeling the activity of 9 muscles: m. gluteus maximus, m. semimembranosus, m. semitendinosus, m. biceps femoris, m. rectus femoris, m. vastus lateralis, m. gastrocnemius и m. soleus. Normalized stride registered data were averaged for complete cycle. Phase structure, line velocity, speed of movement and angle kinematics were estimated. A comparative analysis has been performed investigating test persons based on Ferrigno and Pedotti model. The quantitative results supported the analysis of the disturbances in the passive and active parts of the locomotors system. The types of functional disorder compensations were found out.

KEY WORDS: cyclical movements, kinematical analysis, video-computer analysis, locomotors system model.

TEENAGERS' GROWTH DISORDERS

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INTRODUCTION. Due to the ever changing reality of modern day society, especially felt by the younger generation, major lifestyle changes have occurred that influence the state of health of the population. In this context, medical exams of different profiles (family medicine, pediatrics, orthopedic practice, rehabilitation) show a growing number of growth and somatic development.

AIM. These disorders, functional and structural, (ex Idiopathic scoliosis) are often neglected by the patients and accompanied by psycho-behavioral disorders. These facts have justified the initiation of a longitudinal prospective study that identifies these growth and development disorders.

MATERIALS. The study was conducted on 1000 children and teenagers (ages 10-18), grades IV to XI, in three different schools in Bucharest, whose locomotors and psyche have been evaluated.

METHOD. We used special forms for analysis and clinical and functional interpretation to evaluate somathometric, anthropometry and psycho-behavioral forms. These special forms were used to detect subjective manifestations (ex. somatic pain, tiredness) and objective manifestations of the spine, upper and lower limbs, breathing dynamics, effort endurance.

RESULTS. The screening was used to create a data-base by introducing the data from the special forms and the statistical interpretation of the data, using the SPSS software. The dynamics and the different relations of the parameters were monitored. This stage focused on identifying the percent of children who were within the normal growth limits and are able to withstand greater physical and emotional stress, and the group of children suffering from minor, medium functional or organic disorders, the last group being in need of special prophylactic programs or targeted rehabilitation programs (ex. scoliosis) and in some situations interdisciplinary medical care and medical and psychological counseling.

CONCLUSION. From the statistical evaluation of 968 children, the distribution of cases with pain as a symptom and spine problems revealed 174 cases, with the highest percentage at dorsal level (122 cases) and lumbar level (114 cases).

NONFARMACOLOGIC TREATMENT EFFECTS ON ENDOCRINE AND METABOLIC PROFILES IN WOMEN WITH POLYCYSTIC OVARY SYNDROME

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INTRODUCTION. Polycystic ovary syndrome (PCOS) is the most common endocrine disorder of premenopausal women, affecting 6-8% of this population. It is characterized by hyperandrogenism and chronic anovulation. Independent of the presence of obesity, these women are frequently insulin resistant and therefore have hyperinsulinemia, which appears to play a pathogenic role in the disease. Consistent with the pathogenic role of hyperinsulinemia, it has been observed that the weight loss in obese patients with PCOS decreased insulin and androgen levels, with a significant improvement in fertility.

Materials and Methods. 14 obese and insulino-resistant women with PCOS were recruited for this study. Diagnosis of PCOS was based on the presence of hyperandrogenism and chronic anovulation; related disorders with similar clinical presentation were excluded.

Estimates of insulin resistance were derived from the HOMA index (basal glucose mmol/l x basal insulin μ U/ml/22.5); insulino-resistant women were defined by HOMA >3. Blood samples were drawn in the morning after an overnight fast, during the early follicular phase of the menstrual cycle or during amenorrhea. Serum LH, FSH, testosterone, free testosterone, IGF-I, insulin, glucose, cholesterol, triglycerides, LDL and HDL cholesterol were measured. Serum LH, FSH, testosterone, free testosterone were measured by chemiluminescence on an ACS 180 analyzer system (Bayer Diagnostic Ltd).

The women have normal glucose tolerance by the criteria of the World Health Organization. Patients were evaluated at baseline and after 6 months of nonpharmacologic treatment (the nonpharmacologic treatment included regular aerobic exercise and diet with 1000 cal).

Results. After treatment 6 women had their menstrual pattern substantially improved.

Pregnancy occurred in 3 patients (28.57%). Characteristics of patients before and after 6 months of nonpharmacologic treatment:

	Baseline characteristics	Characteristics of subjects after treatment	p
LH (mIU/ml)	12.02 \pm 2.98	10.93 \pm 2.87	>0.05
FSH (mIU/ml)	5.04 \pm 0.70	5.18 \pm 0.54	>0.05
Testosterone total (ng/dl)	127.38 \pm 21.74	123.34 \pm 20.78	>0.05
Testosterone free (pg/ml)	4.39 \pm 0.55	3.05 \pm 0.31	0.0E
DHEAS (μ g/dl)	352.9 \pm 31.34	323.83 \pm 22.57	0.009
Androstenedion (ng/ml)	3.86 \pm 0.33	3.37 \pm 0.35	0.008
Estradiol (pg/ml)	76.11 \pm 5.56	77.67 \pm 5.15	>0.05
Insulin (μ U/ml)	27.37 \pm 2.85	21.34 \pm 2.85	>0.05
IGF-I (ng/ml)	326.98 \pm 24.85	304.53 \pm 18.61	>0.05
Fasting blood glucose (mmol/l)	4.87 \pm 0.39	4.52 \pm 0.32	0.01
HDL-cholesterol (md/dl)	49.5 \pm 6.64	53.07 \pm 4.96	>0.05
LDL-cholesterol (mg/dl)	135.57 \pm 2.067	123.93 \pm 16.01	>0.05
Triglyceride (mg/dl)	91.29 \pm 16.39	88.00 \pm 12.45	>0.05
Cholesterol total (mg/dl)	203.29 \pm 17.86	186.21 \pm 24.58	0.04

Conclusions. Nonpharmacologic treatment improved insulin-resistance and decreased androgen levels, with improvement in fertility in obese women with PCOS.

Key words: polycystic ovary syndrome, hyperandrogenism, hyperinsulinemia.

REHABILITATION ASPECTS CONCERNING TRAUMATIC LESIONS OF EXTERNAL POPLITEAL SCIATIC NERVE
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Introduction. It is very unusual the total lesion of the sciatic nerve (traumatic or not); the most frequent and the most dysfunctional for the patient is the lesion of one of its two components – the external popliteal nerve. This paper evaluates the functional deficits after a traumatic lesion of EPS and the necessity of an early and individualized rehabilitation therapy for a good recovery.

Material and method. We designed a retrospective study on a 96 patients who suffered traumatic lesions of EPS nerve and we evaluated them at the beginning and at the end of the rehabilitation programme in our clinic. The recovery program was complex and strictly individualized depending upon the clinico-functional status of every patient; it consists in kinetotherapy, low frequency and exponential electrostimulations, analgetic electrotherapy, lasertherapy, ultrasound.

Results. The evaluation of the patient consists of : pain intensity score (on visual analogue scale), neuro-muscular appreciation (muscular balance, neurologic evaluation and EMG), gait examination and functional implications (FIM scale). Statistical analysis showed traumatic EPS lesions affecting mostly men (70% of cases), socio-professional active (62% under 45years), especially after road accidents (43%) or work-related trauma (37%); the neurological examination and EMG showed the predominance of neurapraxia and partial axonotmesis (70%), with better prognosis after early initialized rehabilitation.

The study shows pain relief (a decrease of 4 VAS points at 85% cases), sensitive and vasculotrophic improvement at 85% , a better muscular strength in EPS territory for 60% of patients, and of great importance – improvement of the functional capacity for ambulation (25% of those with specific gait abnormalities), but also for familial and socio-professional reintegration.

Conclusions. After traumatic lesions of external popliteal sciatic nerve, the complex therapeutic rehabilitation methods (including neurotrophic drugs, electrostimulations, analgetic electrotherapy, massage, splinting, kinetotherapy) during hospitalization and continuously daily training after the initial program has a major role for clinical and functional improvement of the patient, better quality of life and socio-professional reintegration.

Key-words: external popliteal sciatic nerve; clinical and functional evaluation; rehabilitation program.

APPLIED EXERCISE PHYSIOLOGY

STRENGTH AND POWER TRAINING FOR ELITE ATHLETES

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In strength training weights may be lifted at different velocities depending namely on motivation and fatigue. Lifting the same weight at different velocities elicits different peak force as well as peak and mean power. It may be assumed that these differences can have a substantial impact on adaptation processes and the training outcome. With the aim to test this assumption two training studies have been carried out. In the first one the subjects performed the same weight training (6 set 6 reps each, with 70 % of 1RM, 3 times a week for 8 weeks) with the only difference in velocity in concentric phase. One group trained at rather commonly used slow velocities (0.2 m/s to 0.3 m/s), another one lifted the weights applying full effort, i.e. at highest attainable velocities (between 0.6 m/s and 0.7 m/s).

Results showed that both groups improved significantly in all parameters tested, i.e. 1RM, maximal power, as well as mean power and fatigue index in diagnostic set of 15 maximal effort repetitions with 70 % of 1RM. However, the gains due to fast velocity training were much more pronounced as compared to the effect of training regime consisting of exercises performed at low velocities in concentric phase. Better effect of dynamic type of training may be ascribed to differences in recruitment of muscle fibres. Since repetitions with the same weight performed at faster speed require recruitment of higher number of muscle fibres, more effective stimulation may be expected. Also higher peak forces could contribute to greater gains after more dynamic type of training. More pronounced testosterone and human growth hormone response to exercise bouts of higher intensity might also foster the adaptation processes after training performed at high velocities in concentric phase.

In the second study two groups underwent 8-week training program with 70 % of 1RM. Bench press sessions (3 in a week) consisted of 3 sets 10 reps each (group 1) or 10 sets 3 reps each (group 2). Every repetition had to be performed with maximal effort in concentric phase. Results showed that though there were no significant differences in gains of maximal isometric force, the values of force, subjects were able to generate in initial 200 ms of maximal voluntary contraction increased significantly higher in the group performing more sets with fewer repetitions. This can be ascribed to the fact that intensity of repetitions performed in shorter sets was substantially higher than in more fatiguing sets of 10 reps each. Drop in power production is assumably due to fatigue of fast twitch fibers, which fail to recruit fully to the end of the more exhaustive high repetition sets. Such a lesser stimulation of fast twitch fibers leads to their less pronounced adaptation changes resulting in failure to significantly improve rate of the force development.

It may be concluded that in explosive type of sports, in which maximal muscular power as well as the rate of the force development are important factors of performance, lifting weights with maximal effort in concentric phase with lower number of repetition in sets seems to be more appropriate alternative of strength training than the one performed at slow velocities till pronounced exhaustion.

EXPRESSION OF CALCITONIN RECEPTOR IN THE RAT QUADRICEPS FEMORIS MUSCLE

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INTRODUCTION. Calcitonin is a natural peptide hormone produced by parafollicular cells (C-cells) in the thyroid gland. Binding of low concentrations of calcitonin to the calcitonin receptor on osteoclasts induces a rapid change in the cytoskeletal structure of the osteoclasts *in vitro*, which in turn leads to a reduction in bone resorption. Furthermore, calcitonin has been recently shown to possess regulatory actions on cartilage and subchondral bone, which may cause long-term clinical benefits. The expression of calcitonin receptors in muscles has not been adequately investigated. The aim of this study is to investigate the expression of calcitonin receptor in the rat quadriceps femoris muscle.

MATERIALS/METHODS. Twelve 21-day-old male Wistar rats were housed in well-ventilated stainless cages with 12-hour light-dark cycle and a maximum of 3 rats per cage. Six of them were provided food and water *ad libitum* and the rest only water for two days, after which all the animals were sacrificed. The right quadriceps femoris muscles were dissected, fixed (10% neutral formalin for 24 h), embedded in paraffin (4- μ m thick sections) and processed for immunohistochemical staining of the calcitonin receptors. The protocols were approved by the appropriate University committee.

RESULTS. Immunoeexpression of calcitonin receptors was evident in the connective tissue around the muscle fibers.

CONCLUSIONS. Calcitonin receptors are expressed in the connective tissue around the muscle fibers of the quadriceps femoris muscle. The physiologic importance of calcitonin receptor expression for the development of the region remains to be clarified. **KEY WORDS:** calcitonin, calcitonin receptor, rat, quadriceps femoris.

PHYSICAL ACTIVITY AND PHYSICAL STATUS OF WOMEN OVER 60 YEARS OLD

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Introduction. The aim of this survey was to study the physical status of women over 60 years old and to examine the association between physical capacity and physical activity in this particular period of their life, investigating the effect of physical exercise in those women who had systematic or periodic physical exercise.

Materials/Methods. 380 women from Northern Hellas were studied, aged between 61 to 90 years (mean age of 75 years). The individuals were separated into groups depending on age and other specific characteristics. The data collection was made using the Rapid Assessment of Physical Activity Questionnaire (RAPA). Individuals completed the questionnaire, giving details of their Physical Activity and Physical Status before and after the age of 60 years.

Results. There was shown to be a correlation between physical status and physical activity. The physical status was very good for 50%, medium for 33% and good for 10% of those women who had continued their physical activities over 60 years. The physical status was fairly good for 3%, and bad for 4% of those women who had not continued their physical activities over 60 years. There will be a detailed presentation on the results of this study.

Conclusions. An important percentage of women continuing their physical activities over 60 years old maintain their physical status at satisfactory levels for the normal function of their organism, permitting them to have good autonomy in their lives, especially into very old age.

Key words: physical activity, physical status, physical capacity, third age, women's health.

PHYSIOLOGICAL ISSUES OF EXERTION IN ATHLETES

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This review has a double aim: to report the main trends of applied physiology in sport and to summarize the research performed by our team in this topic. In the first part of the review are outlined the prevailing areas (mechanisms, oxidative stress, genetic factors, doping, etc.) and its methods (cerebral imagery, Holter, telemetry, hormonal and electrophysiological procedures, inventories and questionnaires) specific cardiovascular and endocrine stress-syndromes and elements of psychosomatics, sudden cardiac death (from its causes to prevention) among young athletes, pathophysiological psychoneuroendocrine and systemic consequences of doping, relationship between acute or chronic stress and cardiac pathology, strategies to prevent and manage sport-related psychosocial and environmental factors (identification, increase of organism's resistance, psychotherapy and medication, stress inoculation). The second section mentions briefly our researches made from the 60th till present-day (4 books and over 30 articles). The experimental works belonged to vascular changes in the endocrine organs and to the cardiovascular reactions in exercise, studied on rats, to pharmacological effects on exercise and to ACTH blood level in exerting dogs and to exercise performance in 6-hydroxidopamine sympatectomized rats. As concerns human subjects the paper reports the cardiovascular and metabolic adaptation to exercise and to pharmacological stress, the ACTH blood levels on untrained, trained and over trained persons, the exercise performance in divers in a hyperbaric environment, the physiological characteristics of overtraining, the blood levels of electrolytes and hormones and specific features of exercise stress and some peculiarities of psychosomatics related morbidity in athletes and frequency of streptococci infection of the upper respiratory tract among elite sportsmen. Last but not least a prediction till 2010 of some top athletic performances (WR) is proposed. In conclusion the leading role of physiological research for the sport science is underlined.

A SURVEY: THE EFFECT OF EIGHT WEEKS SUB MAXIMAL PHYSICAL ACTIVITY ON THE PLASMA FIBRINOGEN IN ELDERLY MALES

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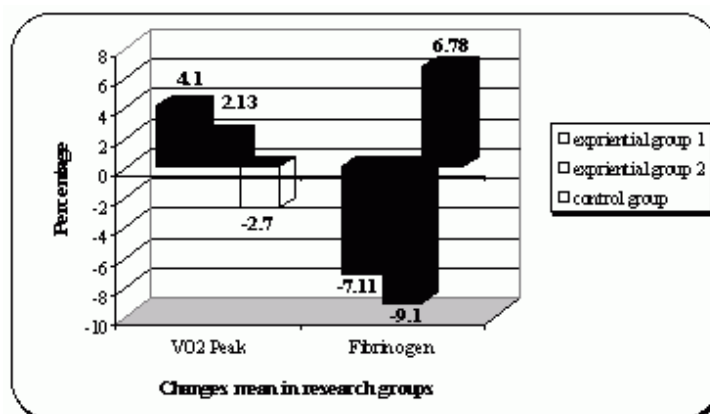
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The researches show the risk of catching disease in the inactive persons is twice as much as active persons. On the other hand, inflammatory indexes serum measure has considered Fibrinogen, Homocysteine and CRP in comparison with bloody fats as strong predictors cardio-vascular occurrences for researchers. Some of the researchers have reported contrary relationship between inflammatory indexes and cardio-respiratory preparedness degrees in the males and females. So, the purpose of research is the survey the effect of eight weeks sub maximal physical activity on the plasma Fibrinogen as cardio-respiratory risk factors in elderly males.

This periodic re-examination was the type of semi-experimental and applied-analytic. The Subjects of the research be consisted of 3 groups of 21 active middle-aged males between 50-75 years old that two experiential 1 and 2, and control groups with Vo2 Peak 51.14±2.7, 52.21±3.23, and 43.61±1.44 (on the basis of 1-mile Track Jog test and were divided voluntary, the information of standard registered health questionnaire, BaecK of Habitual Activity, and casually. Experiential group I carried out Balke-Ware sub maximal aerobic exercise 3 sessions and experiential group II, 5 sessions on the week during 8 weeks. But control group didn't take part in the training program. Systole and Diastole pressure and heart rate was written by pulseoximeter any training program. Plasma Fibrinogen was measured by clot table and chronometric method kit according to mg/dl, before and after 48 hours training program.

Analysis of results carried out paired sample T-Test, One-way ANOVA, multi compare Tukey (LSD) on the surface of the meaningful P<0.05.

ANOVA Test		Sum of Squares	df	Mean Square	F	Sig.
Post-VO2 Peak	Between Groups	991.542	2	495.771	13.973	.000
	Within Groups	638.657	18	35.481		
	Total	1630.199	20			
Post-Fibrinogen	Between Groups	3621.429	2	1810.714	.542	.591
	Within Groups	60128.571	18	3340.476		
	Total	63750.000	20			



The result of research shown Fibrinogen average in the post-test period has decreased in the two experiential groups, and has increased in the control group, but these variances weren't meaningful paired sample T-Test and LSD test results. Furthermore, the variances results of Vo2

Peak average of the research's subjects had shown increase in the 2 experiential groups and decrease in the control group. Also paired sample T-Test showed meaningful difference in surface $P=0.05$ between Vo_2 Peak of all groups. Also results of oneway ANOVA and LSD multiple comparisons showed meaningful difference after 8 weeks in the sub maximal aerobic exercise ($P=0.001$) between Vo_2 Peak of experiential and control groups too.

Generally, the low speed treadmill and increase of one percent gradient/min was considered two important elements of Balke-Ware modified protocol, because all subjects would be carried out 21 stages of 26 stages with out pain and the amplitude of heart rate 115 to 155 beat/min. In other words, their heart rate would be balanced in the higher level. So, although Fibrinogen as risk factors has not shown meaningful variances in the training program, but meaningful improvement of cardio-respiratory performance is an expression of the last training program effect for decreasing these indexes in the experiential group and prevention the incidence of cardio-vascular probable failures and perhaps appears to need longer time for more efficacy.

Key words: sub maximal physical activity, fibrinogen, elderly male.

USAGE OF ENCUMBERANCE PROTOCOL DEPENDING OF SPORTS DISCIPLINE

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INTRODUCTION. There are many ergospirometric tests that are using for diagnose functional capacities of sportsmen. Even they are different in encumbrance protocol it is important to say that they are very similar in results of maximal oxygen consumption (VO₂ max).

METHOD. On an occasion of aerobic capability diagnose sportsmen that are participators of Olympic games in Beijing we used Vita maxima protocol on treadmill and constant cycle ergometry test depending from discipline of sport. Our results point on adequate usage of encumbrance protocol for diagnose of aerobic capabilities of sportsmen.

RESULTS. Correlation between derived data: heart rate (HR) and relative oxygen consumption (VO₂ ml/kg) on Vita maxima protocol treadmill (0,971) and cycle ergometry (0,961); correlation heart rate on treadmill and heart rate on cycle ergometry (0,908); VO₂ ml/kg treadmill and VO₂ ml/kg cycle ergometry 0,957; R treadmill and R cycle ergometry (0,984).

KEY WORDS: treadmill, cycle ergometry, correlation and encumbrance protocol.

RELATION BETWEEN VO₂max AND SOME BIOCHEMICAL PARAMETERS DURING THE TRAINING PROCESS OF PROFESSIONAL SOCCER PLAYERS

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INTRODUCTION. The football game is a type of high intensity, intermittent type of physical loading by activating all metabolic ways of energy production. The supercompensation of the organ systems is a desired aim, including of the increasing of VO₂max. On the other side, some biochemical parameters, as creatine kinase (CK), free radicals (FR) and potassium ions (K⁺), are mentioned in the literature as the indicators of adaptation or disadaptation of the training process in soccer.

The aim of this study is to evaluate the relation between VO₂max (dependent variable) and some biochemical parameters (independent variables) in process of evaluation of the effects of training process of professional soccer players.

MATERIALS AND METHODS. This study included 30 professional football players from one of the teams of the first football league. The investigations were made at three points: in the beginning of the preparation period, after the preparation period, and after competition period. Each of the investigations was performed in three phases. The following parameters had been determined: indirect VO₂ max (ml/kg/min) during a maximal treadmill test; before and after maximal treadmill test, plasma concentrations of CK, FR and K⁺ by DEROM method; responses of plasma concentrations of CK, FR and K⁺ as differences of their concentration before and after maximal treadmill test.

RESULTS. There were the significant changes of VO₂max during the training process of soccer players, an increasing after the preparation phase and a decreasing at the end of the phase of competition. At the same time, there were the significant changes of biochemical parameters: an increasing of plasma concentration of FR and K⁺ on the one side, and a decreasing of plasma concentration of CK, on the other side, at the end of phase of competition. Only the decreasing of the CK plasma response after the maximal treadmill test, after the preparation phase, showed a significant negative influence on VO₂max.

CONCLUSIONS. The increase of VO₂max after the phase of preparation, as a positive effect of training process, was connected with a decrease of CK plasma response on maximal treadmill test, maybe as a result of an adaptation of muscle cell membrane on increased volume of training in the phase of preparation. Taking account the decrease of VO₂max at the end of phase of competition, together with the decrease of plasma CK and CK plasma response on maximal treadmill test, on the one side, and increase of plasma FR and K⁺ and their responses, on other side, it was indicated that there were some signs of fatigue and disadaptation at the end of the phase of competition.

KEY WORDS: soccer, VO₂max, creatine kinase, free radicals, potassium.

EXPRESSION OF CALCITONIN RECEPTOR IN THE RAT TEMPORO – MANDIBULAR JOINT STRUCTURES

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INTRODUCTION. Calcitonin is a natural peptide hormone produced by parafollicular cells (C-cells) in the thyroid gland. Binding of low concentrations of calcitonin to the calcitonin receptor on osteoclasts induces a rapid change in the cytoskeletal structure of the osteoclasts in vitro, which in turn leads to a reduction in bone resorption. Furthermore, calcitonin has been recently shown to possess regulatory actions on cartilage and subchondral bone, which may cause long-term clinical benefits. The aim of this study is to investigate the expression and localization of calcitonin receptor in the rat temporomandibular joint structures.

MATERIALS/METHODS. Forty-eight 21-day-old male Wistar rats were housed in well-ventilated stainless cages with 12-hour light-dark cycle and a maximum of 3 rats per cage. The rats were provided food and water ad libitum. Six animals were sacrificed every time at days 3, 7, 10, 14, 17, 21, 24, 28. The right temporomandibular joints were dissected, fixed (10% neutral formalin for 24 h), demineralised (10 days in 5% formic acid), embedded in paraffin (4-µm thick sections) and processed for immunohistochemical staining of the calcitonin receptors. The protocols were approved by the appropriate University committee.

RESULTS. Immunorexpression of calcitonin receptors was evident intensively around the bony cavities and mildly in some muscle fibers.

CONCLUSIONS. Calcitonin receptors are expressed in the bony and muscle structures of the rat temporomandibular joint. The physiologic importance of calcitonin receptor expression for the development of the region remains to be clarified.

KEY WORDS: calcitonin, calcitonin receptor, rat, temporomandibular joint.

PHYSICAL WORKING CAPACITY OF 12-17 YEARS OLD VISUALLY IMPAIRED BOYS AND GIRLS

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INTRODUCTION. Cardiorespiratory endurance is an important component of health-related physical fitness. The main factor for improving of aerobic fitness is physical activity. Visually impaired children has lower level of habitual physical activity that their counterparts with normal vision.

The aim of this study is to examine the age- and sex-associated variations of PWC170 of visually impaired children and adolescents.

Methods. In this study participated 109 blind adolescents (64 boys and 45 girls), pupils at both special schools for visually impaired children in Bulgaria, aged between 12 and 19 years. Physical working capacity (PWC170) was measured in W, using Monark bicycle as a continuous test with three workloads of 3 min each. Statistical significance between means was tested by Student's t-test.

The PWC170 of visually impaired adolescents was about 70% of that of normal adolescents at the same age. When PWC170 was expressed per kilogram of body weight no significant difference was found between age groups, but the differences between both sexes remained significant. The expressing of PWC170 in relative values didn't change the difference between visually handicapped and sighted boys and girls. The results showed that visually impaired adolescents have considerably lower physical working capacity than sighted adolescents, probably due to their low habitual physical activity. That could negatively impact on their health and well-being.

Key words: visually impaired adolescents, PWC170.

PREGNANCY AND GIVING BIRTH OF ELITE ATHLETES

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Introduction. The moderate level of exercise on a regular basis during a low risk pregnancy has minimal risk for the fetus and beneficial metabolic and cardio-respiratory effects for the exercising pregnant woman. Pregnancy in the elite competitive athlete will require some alteration in training.

The aim of the present study is to investigate the influence of the period of pregnancy and giving birth in elite female athletes.

Results and discussion. 38 elite female athletes from 14 sports have been surveyed. 32% of them stop active training right after getting pregnant. The rest continue till the 10th week (28%) and others even longer till the 6th month: (athletics and rowers). Few continue their participation in competitions till their 4th month of pregnancy, while the larger part (78%) discontinue before that. Only 3 athletes have had some health problems. The pre-birth contractions, the labor until the actual delivery of the baby last the average of 6-7 hours and in 89% of the cases birth is natural. Postpartum about 50% stop with their sports career due to various personal and social reasons. Those who continue go back to their physical programs in the period between 2 and 10 months after giving birth. It is very important that 90% of the athletes mark achievements better than those before pregnancy. This happens after different periods of training.

Conclusion. The elite sport is not an obstacle for normal maternity and physiological functioning of female athletes. On the contrary maternity can have positive influence on achievements.

Key words: female athletes, pregnancy, giving birth.

**THE CHANGES OF BLOOD LACTATES, IN CORRELATIONS WITH SOME BIOCHEMICAL PARAMETERS,
DURING THE TRAINING PROCESS OF PROFESSIONAL SOCCER PLAYERS**

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INTRODUCTION. Although the blood lactates and anaerobic threshold (AnT) are the well established parameters in following up the training process of professional soccer players, some other biochemical parameters, as creatine kinase (CK), free radicals (FR) and potassium (K⁺) are interested in monitoring the volume and intensity of soccer training process. Some other data suggest that CK could be a better indicator of training adaptation than LDH and blood lactates.

The aim of this study is to evaluate the changes of blood lactates, in correlations with some biochemical parameters, during a soccer competition half- season.

MATERIAL AND METHODS. This study included 30 professional football players from one of the teams of the first football league. The investigations are made at three points: in the beginning of the preparation period, after the preparation period, and after competition period. Each of the investigations was performed in three phases. The following parameters had been determined: AnT (km/h and beat/min) with Conconi method; blood lactates during maximal treadmill test and during high intensity soccer training, divided in 6 series (4 minutes exercise with 2 minutes rest) of high intensity aerobic-anaerobic training; before and after maximal treadmill test, plasma concentrations of CK, FR and K⁺ by DEROM method; responses of plasma concentrations of CK, FR and K⁺ as differences of their concentration before and after maximal treadmill test.

RESULTS. Although there were no significant differences in blood lactates during the maximal treadmill test between three phases of training process, the blood lactates on the level of reached AnT significantly decreased after the phase of preparation, increased on the maximal level and decreased after the stage of recovery at the end of phase of competition. There were the significant increases in blood lactates after the 6th series and phase of recovery of high intensity soccer training at the end of phase of competition. The AnT changed insignificantly during the training process. There were significant correlations between blood lactates and biochemical parameters, especially with K⁺ at the end of phase of competition.

CONCLUSIONS. All results suggest that after the started adaptation on increased volume of training, after the phase of preparation, there are signs of depletion of glucostatic regulation, connected with fatigue and disadaptation at the end of competition season. Accordingly with no increased of AnT, the necessity of changes of training process of this soccer club is obvious.

KEY WORDS: soccer, blood lactates, creatine kinase, free radicals, potassium.

LOWER LIMBS MUSCULAR PERFORMANCE EVALUATION IN SKIERS

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Increasing muscular performance (a combination of muscular strength, endurance and stamina) is an important target for all professional skiers. The present study is aiming to present the most important indicators and their importance in evaluation of muscular performance in skiers.

Eleven alpine skiers (aged 23 ± 4 years, height 177 ± 8.2 cm and weight 82.3 ± 12.5 kg) selected among students who chose to specialize in ski from Physical Education and Sport Faculty, West University Timisoara were randomly included in our study. They were evaluated using girth measurement, cardiopulmonary exercise testing (CPX) and dynamic strength measurement. During CPX test the subjects were pedaling on the bicycle ergometer and we recorded the maximum work rate (WR) and $VO_2\max$. For dynamic strength evaluation the subject was required to perform 5 lower limbs triple extensions on the DYN0 ergometer – maximum and average pushing force (Fmax and Favg) were displayed. At the end of the study we tried to correlate the obtained parameters in order to see which are the best to be used in skiers evaluation. The strongest correlations were obtained between WR and Fmax ($r^2=0.44$, $p=0.04$) and Favg ($r^2=0.49$, $p=0.01$). No correlation was observed between thigh circumference and any of the other parameters. We conclude that WR, Fmax and Favg are very useful parameters for lower limbs muscular performance evaluation in skiers. Even thigh circumference measurement is a very easy and traditional evaluation; it isn't an accurate determinant of muscular performance.

KEY WORDS: muscular performance, skiers, work rate.

THE CONNECTION BETWEEN PHYSICAL ABILITY AND ANEMIA WITH YOUNG SOCCER PLAYERS SELECTED TO PLAY FOR SENIOR TEAM

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INTRODUCTION. In this study the functional – physical ability of young soccer players, 16 years of age, and the effect of physical activity on anemia has been monitored. It is a well known fact that the degree of readiness can be determined by oxygen-uptake tests (direct and indirect methods), and the effect of physical activity on the body can be determined and monitored with laboratory blood analysis tests.

METHOD. The functional ability of a soccer player, the degree of readiness is determined by the submaximum indirect test of oxygen uptake – the Astrand test. For the ones who displayed signs of anemia, the number of red blood cells, hemoglobin and hematocytes. The number of soccer players tested is 22.

AIM. The initiative of this study is to show the connection between the degree of functional activity that is emphasized with oxygen uptake (VO_2max) and anemia emphasized with the number of red blood cells, hemoglobin and hematocytes, with young soccer players 16 years of age, selected to play for the senior team.

CONCLUSION. The selected sample shows that there is no sign that physical activity causes anemia, but it does show that there is a direct link between the parameters of the blood analysis (red blood cells, hemoglobin and hematocytes) and oxygen uptake ($VO_2 max$).

KEY WORDS: oxygen uptake, anemia, young soccer players.

FORCED EXPIRATORY VOLUMEN IN THE FIRST SECOND (FEV1) OF THE ELITE SERBIAN MALE VOLLEYBALL AND HANDBALL PLAYERS

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Forced expiratory volume in the first second (FEV1) is important measure of pulmonary function. It is defined as the volume of air that can be forced out in one second after taking a deep breath.

The aim of this study was to determine if handball and volleyball are associated with better lung function compared to non-athlete, healthy, non-smoking population. For that purpose 18 elite male volleyball players (age: 24 +/- 5 years, years of playing: 13 +/- 2, hours of training per week: 37 +/- 3) and 19 elite male handball players (age: 22 +/- 6 years, years of playing: 11 +/- 2, hours of training per week: 33 +/- 6) volunteered for the study. Forced expiratory volume in the first second (FEV1) of all volleyball and handball players was measured by flow spirometer.

Results were compared to those predicted for their age and height, based on formulas for the non-athlete, healthy, non smoking population.

Elite Serbian male volleyball and handball players had FEV1 ranged from 95 % to 132 % (mean value 122%).

Those results are significantly higher than predicted. Also, there was no significant difference in the lung function between these two sports. This study confirms that physical activity, such as volleyball and handball, can improve FEV1, maintaining a normal respiratory function.

COMPARISON OF BMI AND OXYGEN CONSUMPTION WITHIN WATERPOLO PLAYERS OF DIFFERENT AGE
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Waterpolo is a sport which characteristic is high aerobic endurance. Children are enrolled in the process of training already at the age of 10 and 11.

Studies of some authors show that there are differences in some of the cardiorespiratory parameters between young athletes enrolled in the process of waterpolo training and those who do not practice sport actively.

The aim of our study was to spot the difference in some of the parameters (absolute oxygen consumption $\dot{V}O_2$ (ml/min), relative oxygen consumption $\dot{V}O_2/\text{kg}$ (ml/min/kg), bodymass index (BMI), percentage of muscles and oxygen consumption per kilogramme of muscle tissue, between two groups of young representative waterpolo selections aged 1988 to 1990 and 1991 to 1993).

By applying the T-test to small independent samples on the level of statistic significance $\alpha=0.05$, we spotted a difference in BMI, while regarding all the other parameters, we didn't notice any significant difference. This shows that the training stimulus leads to identical adaptive changes in cardiorespiratory system and that the spotted difference probably arises from a different degree of biological development.

Key words: waterpolo, oxygen consumption, BMI, young athletes.

DYNAMICS OF PARAMETER CHANGES OF LUNG VENTILATION DURING DIFFERENT EFFORT IN KARATE AND ORIENTEERING

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In this prospective study values of parameters of respiratory functions were observed – Lung ventilation, VE, with subjects training different sports: karate and orienteering. VE – minute values of lung ventilation is the amount of gas expired per minute. From a resting value of about 6.0 L/min, the ventilation increases to 100, 150 and in extreme cases, 200 L/min).

The aim of the performed analyses was to notice dynamics of changes in values of parameters VE of lungs during the observed measuring periods between the two observed groups of subjects training different sports, (bifactorial analyses variance was used at repeated measurement) as well as changes of (observed) parameters during the subject exposition to the effort, within each group. Period of measurement in this model was given as a factor within the group and factor of training of different sports was a factor of difference between observed groups of subjects.

Forty-eight athletes (juniors, mixed gender group) were observed, twenty-four from each group using spirometric test on treadmill, by direct method, as to Vita maxima protocol. Values of these parameters were observed in four different periods depending on subjects' exposition to the effort: before, during, at the maximal and three minutes after the effort.

Before testing no statistically significant difference in VE values, between karate and orienteering subjects (t-test; $p=0.936$) was noticed. At the optimal effort they are a bit higher, but not statistically significant values within a group of karate athletes (t-test; $p=0.610$).

Analyzing the difference statistically significant increase of VE values during the subjects exposure to optimal effort was noticed, then statistically significant increase at exposure to maximal effort and statistically significant fall 3 minutes after the exposure to the effort. At the period of maximal exposure to the effort, values of VE measured within a group of orienteering were a bit higher (t-test; $p=0.372$).

Statistically significant difference in VE values was noticed three minutes after exposure to the effort.

Analyzing the difference in volume between subjects training karate and orienteering significant difference in VE values during the observed measurement periods was noticed (bifactorial analyses variance at repeated measurements, measurement period factor* kind of sport; $p=0.049$).

Statistically significant difference was noticed in the VE values measured during different measurement periods within both group of subjects (Bifactorial analyses variance, measurement period factor; $p=0.000$). Analyzing the difference statistically significant higher values of these parameters were noticed within orienteering subjects.

Key words: respiratory function, VE, karate and orienteering.

SPORTS CARDIOLOGY

THE ELECTROCARDIOGRAPHIC ABNORMALITIES IN HIGHLY TRAINED ATHLETES IN RELATION TO THE GENETIC STUDY RELATED TO CAUSES OF UNEXPECTED SUDDEN CARDIAC DEATH

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Background: Electrocardiograms in elite endurance athletes shows sometimes bizarre patterns suggestive of inherited channelopathies and cardiomyopathies responsible for unexpected sudden cardiac death. Among other methods, genetic analyses are required for correct diagnosis.

Objective: To correlate 12-lead electrocardiographic patterns suggestive of inherited channelopathies and cardiomyopathies to specific genetic analyses.

Design: Prospective study (2004-2006) of screening 12-lead ECG tracings in standard position and higher intercostal spaces V1 to V3 precordial leads, performed in athletes and normal sedentary subjects aged match. Genetic analyses of subjects with ECG abnormalities suggestive of inherited channelopathies and cardiomyopathies. **Setting:** All cardiologic exams and electrocardiograms were performed at National Institute of Cardiovascular Diseases „Prof Dr CC Iliescu”(Bucharest,Romania). Genetic study were done at National Institute of Forensic Medicine "Mina Minovici" (Bucharest,Romania). **Participants:** 347 elite endurance athletes (seniors190,juniors157), mean age of 20; 200 subjects mean age of 21, belonging to the control group of 505 normal sedentary population.

Results: Seniors. RSR'(V1 to V3) pattern, in 45, 5 of them with questionable Brugada signs. Typically Brugada1 sign in one. 3 epsilon waves, arrhythmic right ventricular cardiomyopathy MRI confirmed in one. ST-segment elevation myocardial injury like in V1 to V3 precordial leads in 34 athletes. Genetic analyses - no gene mutations. Juniors. 5 athletes with abnormal T waves (bifid, n=4; inverted>2 mm ,n=1) and prolonged QTc (0.48"- 0.56") had mutations on KCN genes. 2 athletes with questionable Brugada signs had mutations on KCN and SCN5A genes respectively.

Conclusion: Bizarre QRS, ST-T patterns suggestive of abnormal impulse conduction in the right ventricle, including the right outflow tract, associated in some cases to prolonged QTc interval were observed in highly trained endurance athletes. The genetic analyses, negative in most athletes, identified surprising mutations in SCN5A and KCN genes in some.

**SUPERVISED EXERCISE AND MODIFICATION OF RISK FACTORS:
A THERAPEUTIC WINDOW IN CARDIOVASCULAR DISEASES**

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It is estimated that about 25 – 40 % of the physical performance may be depending on genetic preconditions, whereas the other part is influenced by environmental factors. If interindividual variations in DNA-sequence or diagnostic loci can be identified, they will inform us about the mechanism that regulate a phenotype, also with respect to a variability in physical performance phenotypes. A lot of studies indicate, that there is a certain number of genes which are responsible for differences in the athletic performance capacity, but in the same way for the normal functioning of metabolic pathways and processes which are necessary for a healthy state of an organism. Therefore one can foresee that the use of genetic tests can help to predict performance but on the other hand, such genetic information could also be used to influence life style habits. There are some DNA-variants that are more or less associated with human performance as ACTN 3, others which are more interrelated to both performance abilities and health aspects or even diseases. For example one of the variants of the apolipoprotein E was shown to be associated with differences in lipid profile, but also with a neurologic disease. A polymorphism in a gene encoding the human bradykinin receptor B 2 is associated with mechanical efficiency during cycling but also with exercise induced cardiac hypertrophy. The ACE polymorphism was shown to be probably responsible for endurance or strength performance, but on the other hand also for developing of pathological cardiac hypertrophy. Another example may be found in the PPARG co-activator 1 α polymorphism which - as a mitochondrial biogenesis factor - may play a role in the lipid and carbohydrate metabolism in way of enhancing endurance performance, but on the other hand with the ability of keeping a weight maintenance or a lower incidence of developing diabetes type II. With some of these examples shown in the presentation it is tried to give a better understanding of the role of some of the polymorphisms interrelating with top athletic performance and the primary and secondary prevention.

GRAY ZONE PROBLEM IN ATHLETES

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Sports physicians are frequently involved in an effort to increase the participation of competitive sports, and decrease any potential risk among subjects with heart disease. Healthy young athletes very rarely experience extremely severe cardiovascular events, these events are dropped a bomb into population. Hypertrophic cardiomyopathy is a complex cardiac disease with a heterogeneous genetic, morphologic, and clinical spectrum and it is the most important cause of sudden cardiac death among young athletes. The diagnostic criteria for hypertrophic cardiomyopathy includes a hypertrophic, but not dilated, left ventricle, in the absence of systemic disease or left ventricular hypertrophy due to left-sided obstruction. The differentiation between physiological and pathologic hypertrophy may be difficult, and is important in determining the presence or absence of cardiac disease in athletes in order to prevent exercise-related sudden cardiac death.

A specific finding in this study is a lower incidence of grey scale in athletes, even though high prevalence of hypertrophic cardiomyopathy is thought to be expected in the general population. It is accurately known frequency known highly trained adult athletes show mildly increased left ventricular wall thicknesses of hypertrophic cardiomyopathy diagnostic level, which define a grey zone where extreme expressions of athlete's heart and mild morphological forms of hypertrophic cardiomyopathy overlap. Although echocardiography may not be cost-effective, it is a valuable non-invasive method for differentiating cardiac pathologies other than athlete's heart. Echocardiography is not only helpful for the accurate diagnosis of hypertrophic cardiomyopathy, but also facilitates its risk stratification, such as the level of outflow tract obstruction.

STRATEGY OF CARDIOVASCULAR TESTING IN YOUNG ATHLETES FOR THE PREVENTION OF CARDIAC COMPLICATIONS

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Cardiovascular screening in young athletes has traditionally been performed by means of personal or family history, physical examination with or without 12-lead ECG. This screening protocol has a limited power to detect potentially lethal cardiovascular abnormalities in young athletes. The future for prevention of sports-related cardiovascular complications and fatalities lies in continuing efforts to better understand the substrates and mechanisms underlying sudden cardiac death in the athletes and to design more specific and efficient testing strategies.

The aim of the pilot stage of the international Slovak-Ukrainian project is to elaborate a protocol of cardiovascular examination for young competitive athletes for further testing of it in sports cardiology practice for reduction of the incidences of cardiovascular complications and fatalities.

The proposed cardiovascular protocol includes family and personal history, physical examination, intensity of training load, blood pressure measurements, as well as mandatory basal 12-lead ECG, that is considered positive, according to accepted criteria. Subjects who have positive findings at basal evaluation are referred for additional testing, such as EchoKG, Holter ECG, HRV, ABPM, exercise or pharmacological testing, SAECG, TEAS, or in uncertain cases stress myocardial perfusion imaging, cardio CT or MR imaging, coronary angiography, and electrophysiological study may be necessary in order to confirm or rule out the suspicion of heart disease or abnormalities.

Although the implementation of the testing protocol in both countries depends on the particular socio-economic and cultural backgrounds as well as on the specific medical systems in place, the hope is that the proposed strategy of cardiovascular testing in young athletes may have a significant practical and ethic value as well as socio-economic impact.

Key words: sports-related complications, cardiovascular testing, protocol.

FREQUENCY OF EXPANDED QRS COMPLEX LENGTH DEPENDENT SPORTIVE PROBATION AT YOUNG SPORTSMEN

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Continuous properly dose trainee process run into adaptive changes of cardiovascular system. One of accompanying electro physiological change is expansion of QRS complex and presence of RR' waves in the right precordial lead ventholes. It is mostly physiological right bundle branch block with wideness of QRS complex less than 100ms and RR' wave in V1 without any signs of cardiac failure, occurred as result of focal hypertrophy lateral wall of right ventricle nearby the border of AV junction and pulmonary conus.

The goal of our research was inspection frequency of electro physiological changes as dilatation QRS complex and presence RR' waves in right precordial leads and presence of tracking auscultatory findings between selected and unselected sportsmen, occurred as result of trainee stimulant.

With this research were comprise 77 young sportsmen, 12 to 14 years old, which were in trainee process longer than 2 years and adequate group of sportsmen (by age and by branch of sport) with trainee process up to one year. From 77 young sportsmen 49 boys actively train football and 28 boys actively train handball. To all participants in sport camp 12 channel EKG (Cardiæx) was done.

KEY WORDS: QRS complex, RR' wave, young sportsmen.

MARFAN SYNDROME CAUSING SUDDEN CARDIAC DEATH IN A YOUNG ATHLETE

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Introduction. Sudden death during sports activities is not a rare incident with fatal arrhythmia being the most common cause of death. Marfan syndrome is a relatively common, preventable cause of sudden cardiac death in athletes. It is an autosomal-dominant disorder involving the connective tissue leading to aortic root aneurysm rupture or dissection. Symptoms from the cardiovascular system include hyperventricular arrhythmia, dyspnoea and mitral valve prolapse.

Material. A 26-year-old man, a professional in gymnastics, presented to the Emergency Room complaining of an acute onset of chest pain and back pain and numbness of the left lower extremity. His past medical history included hyperventricular arrhythmia and an incidence of automatic bilateral pneumothorax four years ago.

Results. The contrast enhanced computed tomography revealed dilatation of the aortic root to the level of the renal arteries; a Type I aortic dissection according to the De Bakey Classification. The patient was submitted to the Bentall procedure but he unfortunately died during the cardiopulmonary bypass. Marfan syndrome was diagnosed at autopsy. **Conclusion.** The Marfan syndrome is usually diagnosed in young patients, younger than 35 years, and is associated with a poor prognosis. Early diagnosis of the Marfan syndrome is important so that cardiovascular complications be prevented. Echocardiography is essential to rule out cardiovascular involvement in those suspected of having Marfan syndrome. The significant cost of large population screening should not put a limit to the effort of clarifying the cardiovascular pathology responsible for sudden cardiac death in young athletes.

Key words: Marfan syndrome, athlete, aneurysm, sudden death.

FREQUENCY OF EXPANDED QRS COMPLEX LENGTH DEPENDENT SPORTIVE PROBATION AT YOUNG SPORTSMEN

Nebojša Antić, Tamara Gavrilović, Brankica Đavolović, Jadranka Plavšić, Mirosljub Zlatković, Sanja Mazić

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KEY WORDS: QRS complex, RR' wave, young sportsmen.

CAN THE RIGHT VENTRICULAR OUTFLOW FUNCTION BE CORRELATED WITH QRS ABNORMALITIES IN THE RIGHT PRECORDIAL AND UPPER RIGHT PRECORDIAL LEADS (BRUGADA LEADS)? - AN ECG-ECHOCARDIOGRAPHIC STUDY

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Purpose – to analyze the correlation between the RSR' patern in right precordial leads (V1-V3) and upper precordial leads (V1- V3 Brugada leads) on standard ECG and the right ventricular outflow function (evaluated by standard echocardiography) in highly trained athletes. **Material.** Gr.I (control normal) – 610 c. (280 males; 31±12 years); Gr.II (highly trained athletes: kayak, canoe, rowing)- 110 c.(82 males;23±7 years). **Methods** 1) standard 12 leads ECG – one/two upper space right precordial leads (V1- V3, Brugada leas). 2) echocardiography – right ventricular outflow tract (RVOT) – short axis parasetrnl (diameters; ejection fraction; wall thickness); right ventricular inflow tract (RVIT) – apical 4 chamber (diameters; TAPSE;dP/ dt)

Results.

	Gr. I	Gr. II
Nr.	610	110
RSR' V1-V3	6%	42%
RSR' V1-V3 upper leads	16%	68%
QRS (ms)	80±10	100± 20
RVOT diameter	21±3	27±8, p<0,05
Wall thickness RVOT (mm)	2±0,5	3,5±0,5, p<0,01
RV EF (%)	41±15	48±18
RVIT diameter (mm)	24±3	26±4
TAPSE (mm)	17±8	21±8
RV dP/dt	427± 18	441± 25

RV – right ventricle; RVOT– right ventricular outflow tract; RVIT – right ventricular inflow tract; TAPSE – tricuspid annular plane systolic excursion; EF – ejection fraction.

Conclusions. 1) The RSR' pattern was associated with larger RVOT diameter (27±8, p<0,05) and thicken RVOT free wall (3,5±0,5, p<0,01) in highly trained athletes. 2) The RSR' pattern in right precordial leads (V1- V3) and upper right precordial leads (V1- V3 Brugada leads) on standard ECG was observed in the majority of highly trained athletes (Gr. II: 42%/68%) comparing with normal subjects (Gr. I: 6%/16%).

NUTRITION IN TOP ATHLETES

NUTRITIONAL SUPPLEMENTS: GUIDELINES FOR ATHLETES

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Nutritional supplements are often used by athletes in an effort to optimize their performance. Nutritional ergogenic aids are taken to increase muscle strength and mass, endurance capacity, to achieve a faster recovery as well as to support the immune system to cope with illness and infections.

New substances claimed to have ergogenic aids continue to appear on the market, however often these claims are not based on solid scientific evidence. It is paramount, therefore, to define the substances that actually provide benefits to athlete's performance and clarify the rationale for their use.

One of the most used ergogenic aids is creatine, which has been largely proved to positively affect performance in disciplines characterized by repeated high intensity exercise. In addition to its effect on muscle energetics, creatine has been recently suggested to influence protein balance. Moreover, creatine has been also suggested to influence post exercise muscle glycogen resynthesis.

Oral bicarbonate supplementation is likely to produce advantages during exercises where acidosis constitutes a limit factor to performance. Caffeine supplementation is proved to be ergogenic in various circumstances, however the mechanism leading to these benefits remain to be definitively established. Note, the positive effect of caffeine on performance can be achieved even at doses resulting in urinary levels below the maximal level allowed by the IOC. Another methylxanthine, such as theophylline, has been also proposed to have ergogenic properties.

Hydroxymethylbutyrate has been proposed to induce net protein accretion, however the amount of data available does not allow to make a final statement. Along the same line, individual amino acids are also largely used by athletes but the rationale for their use cannot be totally justified. Antioxidants have been suggested to reduce oxidative damage induced to tissue as a consequence of exercise, but, again, the evidence is not conclusive. Supplementation with bovine colostrum is sometime used by either endurance or strength athletes even though the evidence justifying its use is yet inconclusive.

Finally, oral ribose supplementation is used by some athletes to increase intermittent exercise performance and it has been suggested to increase muscle post exercise ATP resynthesis, however recent scientific evidence has not provided support to these claims. In conclusion, although many substances are based on reasonable claims the recommendation for their use by the athletes should be always supported by scientific evidence regarding their effect and safety.

CREATINE SUPPLEMENTATION INCREASES PROTEIN SYNTHESIS IN CARDIAC MUSCLE

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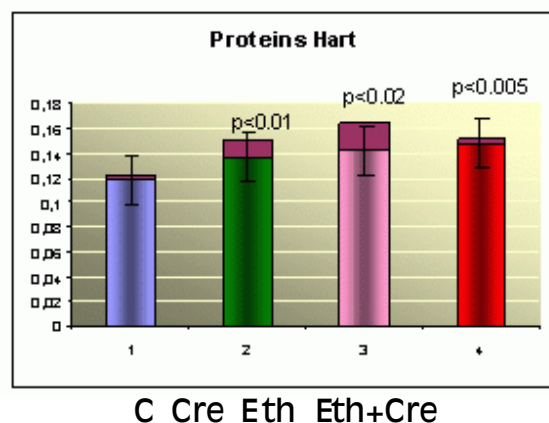
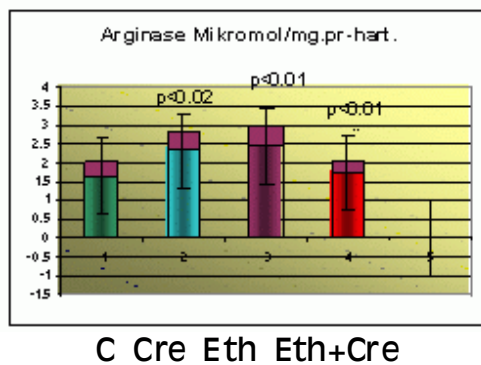
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Introduction. Protein synthesis is essential for muscle growth and development and is important for muscle recovery. There are some information that creatine modulates protein synthesis. We have study where creatine may increase protein synthesis in healthy and in alcohol treated rats. The purpose of this study was to determine the effect of creatine supplementation on the level of protein synthesis in the myocardial muscle

Materials/Methods. Male Sprague Dawley rats were treated for 3 weeks: 1-Control, 2- treated with Creatine monohydrate (2g/kg/ daily, 3- Ethanol (as 15% solution), and 4- with Ethanol and Creatine in the same doses. After the treatment we have measured tissue protein level, and arginase activity in hart tissue homogenate.

Results. Obtained results show increases synthesis of protein after creatine supplementation ($P < 0.02$). Protein synthesis was followed by increases of arginase activity. Arginase is enzyme of arginine metabolism. The enzyme catalyzes the cleavage of arginine to urea and ornithine. Ornithine by the activity of ornithine decarboxylase gives putrescine, which is a precursor for polyamines, spermidine and spermine. It is known that polyamines has important role in protein synthesis.



Conclusion. Results of our study show beneficial effect of creatine on protein synthesis in the heart muscle. Effect of creatine is probably result of increased arginase activity and production of ornithine for polyamine synthesis.

Key words: creatine, arginase, protein synthesis.

EFFECT OF DIETARY CREATINE SUPPLEMENTATION ON KIDNEY FUNCTION

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Introduction. Creatine is being studied as a supplement that may help in many diseases affecting the neuromuscular system. Supplementation of creatine to athletes needs additional investigations about its effect on kidney function. There are reports of renal dysfunction due to creatine supplementation, but there is no information about pre- or existing kidney dysfunction in creatine supplementation. It is known that adverse effects of alcohol on renal function may include glomerular and tubulo-interstitial damage.

Materials/methods. Experimental study of the effect of creatine was performed in healthy and in animals treated with alcohol. In evaluation of kidney function we have measured plasma levels of urea and creatinine, which are still markers of kidney function. Male Sprague Dawley rats were treated for 3 weeks with 1- ethanol (as 15% solution), 2- creatine monohydrate (2g/kg/daily), and 3- ethanol+creatine monohydrate in same doses). 4- control group.

Urea and creatinine in blood plasma were measured by standard biochemical analyses.

Results. of our study show that creatine supplementation increases levels of urea and creatinine in plasma, which is higher in animals treated simultaneously with ethanol compared to control group ($p < 0.001$).

Conclusion. Results of our study show that creatine supplementation increases plasma levels of urea and creatinine. Effect of creatine on plasma levels of urea and creatinine is higher in alcohol consumption. Obtained results may be caused by disturbance of kidney function but it is necessary to exclude other factors, which may contribute to their increase such as the level of their synthesis.

Key words: creatine, urea, creatinine.

THE ALIMENTATION ESTIMATE OF THE YOUNG ATHLETES BASED ON BMI
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The aim of this paper is to give estimate of alimentation of the young athletes. The study was conducted upon the group of 150 children ranging from 13 to 15 years of age, as a part of the regular medical examinations in the Republic Institute of Sport. The examinees (children) were taken from three different sport disciplines – basketball (as a member of the group of Sports Games), swimming (a member of group of Endurance Sports) and judo (a member of Martial Arts group).

Alimentation examination of the examinees was carried out, based on the Body Mass Index (BMI), which is proven as an adequate basic indicator of the state of alimentation among children and teenagers. For both groups, the BMI is sex- and age- dependent. After BMI is calculated for teens, the BMI number is plotted on the CDC BMI – for – age charts (for either girls and boys) to obtain a percentile ranking. The percentile indicates the relative position of the child's BMI number among children of the same age and sex. Obtained BMI values, were found to be ranging from 15.5 to 27.0 kg/m² - with the average of 18 kg/m².

US Center for Disease Control and Prevention data tables were used as a reference.

KEY WORDS: BMI, alimentation estimate, young athletes.

THE OPTIMIZATION OF ATHLETE'S DIET

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A very important role in gaining performance is also the body composition of the athlete, composition which can be idealized just by optimizing the daily diet. This includes a qualitative and quantitative analysis of the daily menus and this cannot be realized mentally or manually, but with a special calculating program dedicated to this problem.

Nowadays, there are enough mathematical patterns, standards and information about the food's nutritional content, which allow solving this issue on the computer. The program used in this paper, estimates anthropometrically actual and ideal parameters of the analyzed subject, calculating individual basal metabolic rate and thermal effect of feeding, and uses the distributions of macro and micronutrients appropriate for the subject (meaning recommended daily doses), analyzed to the end, concerted menu, evaluating and correcting, optimizing the diet. In this paper we present a concrete case which illustrates the possibilities of this method for the benefit of the athlete. Although the procedure can be laborious, the effort of optimization is justified.

Key words: performance, sports, diet, optimization, calculating program.

INFLUENCE OF DARK CHOCOLATE ADMINISTRATION ON URIC ACID, LIVER ENZYMES, LACTATE, GLUCOSE AND TRIGLYCERIDES CHANGES INDUCED BY SUBMAXIMAL EXERCISE IN ATHLETES

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Introduction. Exercise can produce an imbalance between reactive oxygen species (ROS) and the innate antioxidant defense system resulting in oxidative stress. Considerable interest into the outcomes of antioxidant administration was reported. Dark chocolate is rich of flavonoids excreting positive cardiovascular and metabolic effects.

Materials/Methods. A randomised study of two periods of 10 days (control and administration of 50 grams dark chocolate daily) was carried out with eleven competitive swimmers. Each subject took part of two trials of 15 min submaximal exercise on bicycle ergometer consisting of two bouts of 10 min at intensity 60% VO₂max and 5 min at 90% VO₂max conducted without an interval to induce oxidative stress.

Results. Uric acid after performing pre-administration submaximal exercise was elevated by 11.7% ($p < 0.05$) at the end of control period but dropped by 10.9% in response to 10 days of chocolate intake. Blood lactate increased immediately following the submaximal tests up to 6.6 mmol/l and 6.1 mmol/l respectively. Lactate was significantly lower after the dark chocolate treatment. Following submaximal tests pre-administration glucose was elevated to 5.65 mmol/l whereas post chocolate administration glucose levels were reduced significantly. Liver enzymes changes were found within the upper reference range. Post chocolate administration glucose levels were slightly reduced. Aspartate-aminotransferase levels were raised by 14.8% after both tests. No changes in γ -aminotransferase, triglycerides and cholesterol were found.

Conclusion. Dark chocolate administration might modulate and benefit metabolic changes under exercise-induced oxidative stress by reducing ROS production, increasing insulin sensitivity and mobilising liver glutathione to supply muscle tissue.

SPORTS AND PROPOSED PROGRAMS OF DIET

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The balanced diet and the consumption of variety of foods from the athlete, allow high records putting the bases for championship.

The food substitutes the energy reserves that have been consumed. Initially the bodily charge gives rise to the need, which is satisfied as much as possible more rightly via the diet. As long as more intense is the tax, so much bigger importance acquires the dynamic and economy of nutritious substances. For this reason in the athletic diet anyone has to examine the nutritious substances from other prospect. The carbohydrates and the greases are useful in the production of energy and they can depending on the quantity of oxygen that is available to deputize each other. Proteins are used mainly for the replacement and recombining of substances that contain proteins, as the muscular fibres, ferments and hormones. In exceptional cases can be also used for production of energy. Apart from the above-mentioned nutritious substances in the food exist also other that do not supply the same with energy, but are essential for its release that situated in rich of energy nutritious substances. These auxiliary substances are the vitamins, the mineral elements, the trace elements and the water.

The championship cannot be exist without a particular dietary care, different for each athlete and for each sport. An athlete of marathon is nourished differently by that of weight-lifting. The thin marathon

runner eats less from the athlete of weight-lifting, at least the one that is in the bigger categories of kilos. Moreover the composition of food is completely different: the marathon runner is raised with a lot of carbohydrates, vegetables, fruits and little meat, while the athlete of lifting of weights with many proteins. If someone reverses this way of diet of two athletes, it will realize that the special fighting faculty of output of both is clearly decreased. Therefore, the type of charge determines the composition of diet, mainly the relation between main food stuff. So, the ideal and favourable diet for the bodily faculty should be qualitatively and quantitatively adapted in the essential needs, remaining simultaneously complete, so as to is achieved the bigger possible increase of output.

EATING DISORDERS IN ATHLETES A META-ANALYSIS

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INTRODUCTION. Eating disorders are potentially life-threatening ailments, characterized by severely disturbed patterns of eating behavior. According to DSM-IV, eating disorders include: Anorexia Nervosa, Bulimia Nervosa and The Eating Disorder Not Otherwise Specified category.

Objective: The purpose of this project is to examine eating disorders in athletes, using meta-analysis.

METHOD. Data from 21 studies were used to examine the overall relationship between eating disorders, athletes, gender, age groups, and specific sports and performance.

RESULTS. Statistics show that in the USA, 63 % of female athletes develop symptoms of eating disorders. The prevalence of eating disorder in the USA, in the general population, is approx 1.84%. Certain sports seem to induce an increased risk of eating problems (e.g. swimming, aesthetic, and weight dependent sports). Recent studies report few cases involving men, that are implicated in wrestling, track and field, gymnastics.

CONCLUSION. Eating disorders are seen much more frequently in athletes than in non-athletes. Most frequently eating disorders are developed during adolescence, but some reports indicate their onset can occur during childhood or later in adulthood. Eating disorders are not due to a failure of will. They are real medical illnesses characterized by maladaptive patterns of eating. Both, athletes and non-athletes seem to have the same psychological profiles of eating disorders. Although socio-cultural explanations are relevant, anorexia nervosa and bulimia are perhaps better regarded as complex heterogeneous disorders with multifactorial etiology, involving the interaction of genes, environment, family background, particular social factors and certain psychological features, such as: desire to win approval of others, getting attention behavior, perfectionism, self-criticism.

KEY WORDS: athletes, eating disorder, meta-analysis.

DOPING CONTROL

MEDICAL DOCTORS AND DOPING IN SPORT: ATTITUDES AND EXPERIENCE IN BALKAN REGION

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Introduction. During the last two Olympic games, 5 athletes from the Balkan Countries lost medals and 4 athletes have been found to be doping positive out-of-competition, which included 44% of all positive cases in Sydney 2000, and 20% in Athens 2004.

Objectives. The aim of this study is to examine attitudes and experience of medical doctors from Balkan Countries.

Materials and methods. A total of 219 medical doctors from Bulgaria, Greece, Romania, Serbia and Turkey fulfilled the questionnaire related to doping issues.

Results. During the period of 12 months, 80% doctors have been asked for information about doping agents, 25% of the them have been contacted by athletes for the prescription of doping agents, 14% of doctors think that they should assist athletes who want to use doping and in 27% of the cases the doctors have treated athletes who are using doping due to medical problems. They believe that education is the most effective method for fight against doping and the least effective method is two years ban. They put adolescents and children as a first group which needs to be targeted in a doping prevention.

Conclusion. Hypothesis that athletes are not informed about doping because of poor knowledge of medical doctors is supported. Medical doctors from Balkan region are confused and controversial, but they recognize the need for better education and they want to participate in its prevention. However, although this observation does seem encouraging, their limited knowledge of doping should prompt the introduction of adequate training in this domain.

SUPPLEMENTS AND DRUGS IN SPORT - WHAT ATHLETES REALLY USE?

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Introduction. Australian Institute of Sport (AIS) categorized nutritional supplements (NS) in four groups: group A - approved NS, group B - NS under consideration, group C - no clear proof of beneficial effects and group D - banned NS.

Objectives. The aim of our study was to describe qualitatively and quantitatively NS and medications used by elite athletes.

Methods. We analyzed data collected from athletes (n = 618; age 24.2 ± 5.8 yrs; 72% male) from national, international competitions and out-of-competition done by ADAS from 2005 - 2008.

Results. Among reported substances 68.5% were NS and 29.6% medications. NS have taken by 58% (2.87 per athlete) and medications by 39% of athletes (1.87 per athlete). Almost 18 % of all users reported use of 6 or more different products and one athlete took 17 different products at the same time. In group A of AIS classification was (59.6%) and from group B, C and D, 4.6%, 35.1%, 0.8%, respectively. Majority of athletes who reported use of medication used NSAID (n = 173, 71.8%; 27.9% of all examined athletes). More than one NSAID was taken by 26% (45) users. In addition, more frequent use of NS among younger athletes was observed (p <0.05).

Conclusion. Our study confirmed overuse of supplements and drugs by elite athletes. Fact that large number of athletes used supplements with no evident performance or health benefits, demonstrated the need for specific educational initiatives. Amount, quantity and combination of reported products raised concern about risk of potential side events.

VARIA

MENTAL TRAINING BETWEEN FASHION AND PRACTICE

Paula Drosescu
Romania

Motto: Never take the well trodden road, for it will take you where many others have been - Graham Bell.

Specialists in the domain of sports agree that the difference among the 5-10 competitors in a certain sport is made by precontest psychological training while the rest of the ingredients of success stays the same (hard training, post-effort recovery, drugs to support physical effort, diet, passive rest etc). The present paper introduces some of the elements of mental training able to supplement success not only in sports, but also at a personal level.

KEY WORDS: mental training, precontest psychological training, sport performance, neuro-linguistic programming.

BODY COMPOSITION: MEASUREMENT METHODOLOGIES AND PROBLEMS

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Body composition is often questioned in athletes as in normal population at large. Fat body mass and fat free mass are two important components of body composition. Importance of body composition in athlete population is important in evaluation of the effectiveness of training, the level of training, the form, in weight category sports (wrestling, judo, box, weight lifting, etc.) to determine the competitive weight and the method of body weight control and loss.

There are direct and indirect methods of body composition determination. Direct methods are used on human and animal cadavers with some chemical approaches in order to determine the amount of different tissues in the body, and, therefore, they are not used on living bodies. Among indirect methods hydrostatic weighing, anthropometric methods, bioelectric impedance methods, infrared interactance, and some part or whole body counter methods such as DEXA. Direct methods have high validity, and are used to validate indirect methods. In athlete population more frequently indirect methods are used. Indirect methods are developed by using a reference method, and besides direct methods, some indirect methods are also used as reference methods. It is important to notice that the population used as reference during the process of development of the indirect methods, can be the source of error. Most frequently used methods in field situation in determining body composition are anthropometric and bioelectric impedance methods. The main source of error in these methods may arise from non athlete reference population in the development of the methodology. In heterogenic population the range of standard error of estimation (SEE) may be high. High SEE may be a limiting factor in monitoring the training effect in athlete population. In bioelectric impedance methods the time of the day during the measurement, state of hydration of the subject are the most important sources of error. In anthropometric methods the differences in the determination of the measurement site, the reliability of the measuring instruments, expertise level of the measurer, test hour of the repeating tests are the main sources of error.

PHYSICAL ASSESSMENT WITH TECHNOGYM FITNESS EQUIPMENT

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The assessment of the physical fitness is of paramount importance in sport medicine as well as in clinical setting. The maximum oxygen consumption (VO₂ max) measurement can be used to evaluate the efficiency of the subject's cardiovascular system. The VO₂ max is an expression of the organism's maximum capacity to take in and use oxygen per unit of time. The main factors that influence this value can be broken down into central factors, responsible for oxygen intake and transport, and peripheral factors, responsible for the cellular use of oxygen. The VO₂ max can be influenced by the level and type of workout, gender (higher values for men) and age, and differs according to which muscle groups are used during the test. Checking the VO₂ max periodically gives continuous feedback on the effects of the training program and the subject's level of adaptation to the workload.

Maximum aerobic power can be measured directly, using sophisticated and costly equipment that continuously monitors oxygen consumption, carbon dioxide production, pulmonary ventilation and heart rate (HR). The test method is to increase workloads step by step until the subject is completely exhausted. It is, therefore, a maximum test calling for a high level of commitment from the subject, and requires highly specialized personnel. The VO₂ max is calculated either as an absolute value (l/min) or in relation to the subject's body weight (ml/min/kg).

As an alternative, the maximum aerobic power can be measured indirectly, the correlation between VO₂ and heart rate has led to the development of indirect methods that require simple, less costly and therefore more widely accessible equipment. These methods are useful for reliable, large-scale checking of aerobic metabolism efficiency as measured in health and fitness clubs.

In a physical exercise of increasing intensity, the relationship between the cardiac output trend (Q), which represents the quantity of blood the heart pumps into circulation per unit of time (minute), and the workload, or VO₂, is generally linear. The cardiac output is given by the product of the systolic output (SO), which represents the quantity of blood that the heart pumps into circulation with each beat, and the heart rate: $Q = SO \cdot HR$

Since the $VO_2 = Q \times (CaO_2 - CvO_2)$, the VO₂ presents a linear correlation with HR.

The CPR (Constant Pulse Rate) system, which adjusts the workload to keep the heart rate constant, has also led to the development of new methods of testing VO₂ max and new ways of programming cardiovascular training. The most used protocols will be analysed. (Bruce, Balke, Anstrand, Naughton, ACSM metabolic equation). Practical indirect test will be carried out on treadmill and bike.

IMPORTANCE OF PRE – COMPETITION SCREENING OF FOOTBALL

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INTRODUCTION. Responsibility of every football club in Serbia is to organize and perform regular medical exams of the players at least twice a year, in accord to regulations given by UEFA and Football Association of Serbia. These exams comprise, but are not limited to complete internal medicine exam, tests of biochemical and hematologic parameters and urine check, anthropometry, ergo-test, ophthalmologic, ORL and dental exam.

MATERIAL/METHODS. Partizan Belgrade Football Club performs medical exams four times a year. Two of these are regular checks, as described. Two other, control exams are limited to biochemical and hematologic tests. During last five years period, a total of 309 regular medical checks and 286 control tests were made. Tests were always carried out in medical institutions which have the best organization, capacity and equipment for such demand.

RESULTS. During five years period, we have found a total of 154 situations that required additional tests and further medical investigation. These situations include echocardiograph signs of myocardium hypertrophy (96), exercise induced asthma (2), paroxysmal supra-ventricular tachycardia (1), SVES and VES (21), various forms of conduction problems (19), hypertensive response to exercise (12), ventricular septum defect (1), and also ophthalmologic (1) and neurologic problem (1). Also, in control biochemical and hematologic tests, we have found a total of 70 situations that required additional examination and amendment in training program as well as nutrition and supplementation plans, 12 of which were defined as onset of overtraining syndrome. Other problems found during control tests include early signs of sports anaemia (36 cases), iron depletion/deficit (21 cases) and positive HBsAg finding (1). During 5 years there were only three cases of time-limited license for participation in competition, which have been studied properly and followed closely.

CONCLUSIONS. Thanks to medical screening we are in position to early discover and react in all the situations of health hazard, and prevent development of a serious problem which can result in long absence from competition or even end of sport carrier.

KEY WORDS: pre-competition, medical screening, football.

HYDRATION IN PHYSICAL EXERCISE

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Fluid replacement during sports activities helps to maintain hydration before, during and after exercise, promote health and physical performance. The goal of drinking during exercise is to prevent excessive (2% body weight loss from water deficit) dehydration and excessive changes in electrolyte balance to avert compromised performance. Because there is considerable variability in sweating rates and sweat electrolyte content between individuals, customized fluid replacement programs are recommended. Individual sweat rates can be estimated by measuring body weight before and after exercise. During exercise, consuming beverages containing electrolytes and carbohydrates can provide benefits over water alone under certain circumstances. After exercise, the goal is to replace any fluid electrolyte deficit. The speed with which rehydration will determine the replacement program.

CHANGES IN BODY COMPOSITION OF YOUNG BASKETBALL PLAYERS
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OBJECTIVES. The aims of the study were to present body composition parameters of young male competitive basketball players and to show the differences in respected age groups.

METHODS. A total of 52 male basketball players were divided into three groups according to the age: group under 14 (13.8 ± 0.4), group under 16 (15.5 ± 0.5) and group under 18 (17.3 ± 0.5). Two measurements were performed, the first at the beginning of pre-season (August) and second after eight months (March).

RESULTS. Significant increase in the most of parameters was observed after eight months in all groups ($p < 0.05$) as shown on the table.

	Under 14			Under 16			Under 18		
	n=15			n=17			n=20		
	Pre-season	During season	p	Pre-season	During season	p	Pre-season	During season	p
Height (cm)	177.2±11.0	180.4±11.1	0.000*	186.8±10.2	188.5±9.2	0.000*	196.5±9.1	197.1±9.7	0.008*
Weight (kg)	61.2±14.2	66.2±14.3	0.000*	72.5±14.1	77.7±13.7	0.000*	86.9±14.0	90.3±13.0	0.001*
BMI (kg/m ²)	19.3±2.8	20.1±2.5	0.000*	20.6±2.7	21.7±2.6	0.000*	22.4±2.3	23.1±1.9	0.004*
BF (kg)	14.8±3.2	16.1±2.6	0.009*	14.2±3.9	16.3±3.2	0.016*	8.1±4.3	9.5±3.3	0.017*
BF (%)	9.3±3.9	10.9±2.6	0.000*	10.4±4.2	12.9±4.2	0.001*	7.5±5.2	8.7±4.1	0.020*
FFM (kg)	49.9±13.2	57.5±10.7	0.134*	62.1±11.4	64.8±10.4	0.004*	78.5±9.4	81.6±10.3	0.002*

*significant difference ($p < 0.05$), bodyfat = BF, fat free mass = FFM

CONCLUSIONS. We observed significant changes in body composition parameters of young basketball players in eight months period. Comparison between age groups showed that BF % was lower in group under 18 vs. group under 14 and 16, while FFM is highest in group under 18, as a result of growth maturation and intensive training process.

Key words: body composition, BIA, young basketball players, adolescence, bodyfat.

28-DAY DEHYDROEPIANDROSTERONE SUPPLEMENTATION DOES NOT AFFECT BODY COMPOSITION IN YOUNG ATHLETES

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The main aim of this study was to examine the effects of acute dehydroepiandrosterone (DHEA) intake on body composition and serum steroid hormones in young athletes. Twenty young (19 to 22 years) male soccer players were allocated to two randomly assigned trials - ingesting DHEA (100-mg doses) or placebo (PLA) for 28 days. Body weight was not affected by 4 weeks of DHEA supplementation. No significant changes in BMI, WHR, body fat or total muscle mass for the two groups were detected at the end of the trial. There was no within- or between-group difference in arm fat index (AFI) and corrected mid-upper-arm muscle area (cAMA). Treatment with DHEA resulted in significant increase of total testosterone, estradiol and DHEA-S levels in treated subjects versus the placebo group ($p < 0.05$). Results of this study suggest no beneficial effect of DHEA supplementation on body composition in young competitive athletes.

Key words: dehydroepiandrosterone, soccer players, body fat, muscle mass.

PREVALENCE OF SUPERFICIAL FUNGAL INFECTIONS AMONG SPORTS-ACTIVE INDIVIDUALS IN IRAN

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Introduction. Cutaneous mycoses are often associated with sports in public opinion as well as in a practitioners one. Subsequently, practicing of various kind of sport can lead to direct and indirect exposures to and transmission of micro organisms between athletes and also passive observers. This study was conducted to evaluate the occurrence of cutaneous fungal infections affecting the athletes.

Methods. A respectively study of superficial fungal infections in athletes were carried out during the period of March 2002 to December 2006 on 656 mycological proven cases of dermatophytosis found in athletes in Tehran. Mycological examination consisted of culturing of pathologic material followed by direct microscopic observation. Mycological cultures were carried out on Sabouraud Chloramphenicol Agar, Sabouraud Chloramphenicol and Cyclohexamide Agar, and Dermatophyte Agar incubated at 25°C for at least 28 days. Diagnosis was based on macroscopic and microscopic characteristics of the colonies.

Results. We surveyed 1075 Athletes suspected to cutaneous fungal infections from 201 institutions and found 656 (61%) were positive for fungal infections. The fungal isolates comprised *Trichophyton tonsurans* (56%), *Epidermophyton floccosum* (11.8%), *Trichophyton mentagrophytes* (8.9%), *Trichophyton rubrum* (8.3%), *Trichophyton verrucosum* (3.9%), *Trichophyton violaceum* (3.3%), *Microsporum canis* (2.5%), *Malassezia fur fur* (3.3%), and *Pityrosporum oval* (2%). The distribution of the lesions on the body was: trunk> groin> hair and scalp> sole and toe webs> finger nails> toe nails. Fungal infections were more commonly seen in wrestlers and aerobics.

Conclusion. The results suggest that athletic activity seems to be a predisposing factor, especially for fungal infections.

Key words: fungal infections, sport, prevention, Iran.

BIOLOGICAL DIAGNOSIS AND SPORTS PERFORMANCE – IN RUGBY AND SOCCER

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The study aims to emphasize the importance of the state of health in gaining sports performance considering the teams' results observed in the period of time: June 2006 – may 2008.

It was observed the state of health evolution in relation with the performance of the athletes (58 – rugby players – 2 teams, 44 – soccer players – 2 teams).

There were considered both the medical – sportive circuits (4 times in 2 years) and the frequency of being present at a various specialty services of the National Sports Medicine Institute for pathology consultation, and also medical consultations in other clinics (in Bucharest and other cities) especially in services of orthopedics – traumatology. We mention that out of the 102 athletes considered – 6 of them (around. 6%) suffered surgical interventions during the previous mentioned period of time (4 – knee, 1 – shoulder, 1 – ankle). We try to establish correlations obtained for the 4 teams and the information related to the state of health of the components of these teams.

KEY WORDS: rugby, soccer, biological diagnosis, sports performance.

ANTROPOMETRIC PROFILE OF THE ELITE SERBIAN MALE VOLLEYBALL PLAYERS

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The aim of this study is to describe the morphological and anthropometric characteristics of the elite Serbian male volleyball players, trying to identify any differences between playing positions. For this purpose, 18 elite male volleyball players (age: 24 +/- 5 years, years of playing: 13 +/- 2, hours of training per week: 37 +/- 3) were submitted to a body composition evaluation. Body fat percent and body/mass index (BMI) were estimated from : body mass, height, ten skinfolds, seven circumferences and four bone diameters. Body mass ranged from 78 kg to 113 kg (mean value 81,2 kg). Body height ranged from 191 cm to 207 cm (mean value 199,2). Serbian male volleyball players have approximately the same body mass and height as elite male volleyball players from other countries.

Body/mass index (BMI) ranged from 20,23 kg/m² to 27,42 kg/m² (mean value 23.03 kg/m²). Body fat percent ranged from 4,8 % to 16,4 % (mean value 10,76 %). This is ideal BMI and body fat percent for male players. Conclusion: These male volleyball players differed in some respects in anthropometric characteristics according to their different playing position. This is interpreted by their varying roles and physical demands during a volleyball game. Players were found to be relatively homogeneous across the same playing positions.

EFFECTS OF PHYSICAL ACTIVITY ON THE ANTHROPOMETRICS AND METABOLIC PROFILES OF PATIENTS WITH TYPE 2 DIABETES MELLITUS

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INTRODUCTION. Diabetes mellitus is a major health problem of the 21st century. Epidemiological data provided by the International Diabetes Federation show that there are currently 194 million diabetes patients, 51% of the adult population respectively, and that the number will amount to 333 million in 2025, 4.3% respectively. Aside from specialty studies on genetic and autoimmune factors implied in the appearance of diabetes mellitus, the recent period saw an increase of studies on environment diabetogenic factors, the most significant of which are obesity, lack of exercise, age, stress level and the so-called modern lifestyle. Lately, in Europe, this has caused an ever increasing orientation towards disease prevention measures mainly represented by lifestyle changes (diet and exercise), aspects which are not yet developed at a national level, since the "sports for all" phenomenon is still lagging behind many European countries. Recommendations published by the American Association of Clinical Endocrinologists mention the fact that walking for 40 minutes, three times a week, is sufficient to decrease insulin sensitivity and improve glycemic control.

Materials and Methods. 16 Patients with Type 2 Diabetes Mellitus were recruited for this study. Anthropometric parameters, biochemical parameters were determined. Blood pressure was recorded. The anthropometric measurement included waist circumference (WC) and body mass index (BMI). BMI was computed as a ratio of weight to the square of height (kg/m²). Waist circumference was taken at the midpoint between the lowest rib and the iliac crest. Subjects were asked to fast for 12 h before blood sampling, which was done between 8.00 and 9.00 a.m. The plasma glucose, serum triglycerides, serum HDL-cholesterol were measured enzymatically. Patients were evaluated at baseline and at 12 weeks of nonfarmacologic treatment (the exercise intervention included walking for 40 minutes, three times a week). Diabetes medications were adjusted as needed throughout the program.

Results. Characteristics of patients before and after 12 weeks nonfarmacologic treatment:

	Baseline characteristics of subjects	Characteristics of subjects after 12 months of treatment	P
BMI (kg/m ²)	29.37 ± 3.22	29.00 ± 2.8	0.0044
Waist circumference	93.31 ± 11.63	92.56 ± 10.87	0.0028
Serum triglycerides (mg/dl)	196.5 ± 66.27	184.56 ± 58.37	0.0002
Serum HDL cholesterol (mg/dl)	43.81 ± 10.00	46.12 ± 9.47	2.8E-06
Fasting blood glucose (mg/dl)	172.87 ± 34.78	148.00 ± 32.87	0.0017

Conclusions. After treatment a significant decrease was observed in body mass index, waist circumference, serum triglycerides and serum fasting glucose.

Key words: diabetes, exercise, lifestyle.

THE ROLE OF ANTHROPOMETRIC SELECTION IN YOUNG FOOTBALL PLAYERS

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Introduction. Although theoretical the need of anthropometrical selection in football is obvious, in practice we find more and more deviation from the standard. The football player model is tall, robust, powerful and able to face "the fight" in the field, where the risk of injury is high.

Purpose. The purpose of this study was to determinate the role of anthropometric selection in young football players.

Material and method. Our study includes 488 young football players aged from 12 to 18 years, who began to practice football at least 3 years prior to the study. Anthropometric evaluation (height, weight, body composition, physical qualities) were carried out on the occasion of their medical check up in The National Institute of Sports Medicine during 2007.

Results. Studying the anthropometrical parameters at a total of 488 young football players we found that 52.66% are tall, 46.72% are of medium height and 0.6% are under the media. Regarding the weight, 54.7% are under weight, 18% are normal weight and 25% are over weight. Analyzing the body composition it shows that 55.94% have a proper lean body mass, 26.63% have up to 2 kg less lean body mass and 17.41% have over 2 kg deficit of lean body mass. Concerning the adipose tissue, 46.92% of the subjects have appropriate percentiles, 42.62% presenting up to 2 kg more body fat and 10.45% exceed the standards with more than 2 kg. We found that 20.49% of the subjects are in the optimum recommended body weight but from them as a whole only 78% have a proper lean body mass. Off the total number of 488 cases 14.55% are over weight by a large muscle bulk presenting low/normal level of body fat.

Conclusions. The growth status and the physical development, the body composition and the optimum body weight should be closely monitored in young football players.

A rigorous secondary selection is necessary after 3-4 years of football practice. Values close to the anthropometric criteria are favorable for obtaining performance.

Key words: physical development, anthropometrical selection, football player model.

THE RATIO LIMPLOCYTES/LEUKOCYTES - COEFFICIENT IN HIGH - PERFORMANCE OF VOLLEYBALL PLAYERS DURING AN ANNUAL CYCLE

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Introduction. In sports medicine malnutrition which meet especially in sports per weight categories, effects the T cell-mediated immunity, disturbs the complement system, the phagocyte(macrophage) activity, etc. The total lymphocyte number may represent a marker of malnutrition, only if we exclude an infection, a disease associated with depression of the immune system (but the high-performance sports do not depress the immune system?), or a haematological disease; stress and corticotherapy (often used of athletes), may also induce immunodepression.

Materials and methods. The study was effectuated on volleyball players from team „University of Timisoara” from the first division in the competitional years 2004-2005 with a number 13 players. The coefficient limphocytes/leukocytes has been calculated eich threshold value is 0,35, and which has diverse value for quantification the immune system at athletes. The number lymphocytes per mmc (2500-3500) may represent a useful marker for the diagnosis of the protein - calorie malnutrition (PCM); so, a decrease below 1200-1500/mmc represents a light malnutrition, while a decrease below 800/mmc represents a severe malnutrition.

Results. We present in the graphics evolution of the lymphocytes/leukocytes coefficient in different stages of the study effectuate during a year competition at athletes volleyball players from team „University of Timisoara”. From the date analysis it can be observed: an general basal mean values of this coefficient are below the optimal number 0,35 and along the trainings (august 2004), the coefficient value decreases slightly, being maintained constantly under the threshold number. In both official games the coefficient decreases significantly after the game and 60 minutes after the game the mean coeffident values are still below the normal values, perhaps meaning a stressing action of the sportive effort upon the lymphocytes immune system.

Conclusions. The supervision of this coefficient could be used in the medical-sportive control of volleyball p0layers, participants in internal or international competitions, with a guiding marker of the immune reactivity compared to the stress induced by the sportive effort.

Keywords: immune system, lymphocytes/leukocytes coefficient, athletes.

BODY COMPOSITION A PROBLEM OF THIS TIME

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Introduction. The research and the application of the best methods for maintaining the optimal body weight have become some of the principal problems of this time. The body composition determines a lot of the diets which have proved to be inefficient in time unless they aren't accompanied by performing of the physical effort, kinesitherapy, psychology, etc.

Material and methods. In this study we want to ascertain whether practicing of sport determines the optimization of the body weight and a superior physical development. For this we measured the hypodermic tissue of a 80 teen-agers (40 swimmers and 40 no sportsmen). The Pariscova and Yuhasz methods were used to interpret the data acquired.

Results and conclusions - We have come to the conclusion that there are differences between the body composition of those who do not practice any sports. These differences are one of the results of the number of the hours of the physical activities practiced during a week.

Key words: measures, hypodermic tissue, teen-agers.

THE BONE AND TENDINOUS TISSUE BANK – FUNCTIONING AND UTILIZATION

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The bone and tendinous tissue bank insures the necessary of substantial bone and tissue contribution (sports traumatology) which autografts cannot deliver. The best results (integration, consolidation, the absence of adverse reactions etc) are obtained from the transplantation of allograft harvested from individuals below 50 years.

Out of the three classical procedures, the froze fulfills the fundamental desideratum of optimal conservation:

- suppression of cadaverous disintegration phenomena;
- unaltered preservation of cellular structure.

The ideal allograft must fulfill the following conditions: it must be immediately available and 100% secure, it must have identical mechanical properties and minimum morbidity, it must fix securely and immediately, it must ensure the rapid return to the competition activity and offer excellent results in time.

KEY WORDS: allograft, bone and tendinous tissue bank, transplant.

PRESSURE CENTER POSTURE ANALYSIS

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INTRODUCTION. There are a lot of techniques which allow postural oscillation analysis, observed on a subject in orthostatic position, among those, the pressure centre analysis is considered to be a relevant method. The pressure centre can be considered as a nervous system controlled variable, proportionally with the force moment applied with both feet on a standing surface, representing the muscular force necessary for high structure establishment. Pressure center time analysis, can reveal informations about the control postural system. Some authors realised the division of the variables titled of pressure center in 2 categories: global and structural parameters. Global parameters (medium speed) gives a general balance performance representation on a time medium higher than 20 seconds. Structure parameters inform about control processes. Control in proaction which is the main stabilization mechanism process, a sequence of motric anticipation command.

MATERIAL AND METHOD. In this study were tested 2 teams: one formed from ANEFS students, second formed from performance shooting sport's practican't's. The test was made with a new postural test software program, which allows the visualisation of foot pression indicate the body weight center, and the amprents of standing foot. Each subject was tested in standing position 30 seconds. So in the floor surface plan can be established conventionally 2 directions: N-S for anterior-posterior center projection movements, and E-V for laterality. Those movements will register oscillation proportionally with the pressure center instability.

RESULTS AND CONCLUSION. The results show a semnificativ difference between the N-S osdillation for the 2 groups. A possible answer can be that usually the lack of equilibrium has place in the automatic postural answers, speed below 250 msec, which excludes any voluntary control component.

KEY WORDS: pressure center, postural oscillation, postural test software.

MUSCULOSKELETAL INJURIES DURING THE 8th WORLD UNIVERSITY WRESTLING CHAMPIONSHIP 2008
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The purpose of the study is to record the incidence of the athletes' injuries, sustained during the 8th World University Wrestling Championship 2008, held in Thessaloniki, Greece (9-13 July). Twenty seven countries from all over the world participated in the Championship with 226 athletes. There were three wrestling styles: Free style (LL), Female wrestling (LF), Greco - Roman (GR)

Twenty countries participated in Free style, with 77 athletes and 59 matches took place. In Female wrestling 17 countries participated with 65 athletes and 58 matches took place. In Greco-Roman style 20 countries participated with 84 athletes and 77 matches took place. The total of all injuries was 18 and on top of it there was one athlete who suffered from stomach ulcer penetration. In detail there were 7 injuries in Free style, 6 in Female style and 6 in Greco-Roman style. One athlete in Female style sustained 2 injuries. In free style occurred 1 ankle sprain, 1 tooth fracture, 3 knee injuries, 1 neck abrasion, 1 cervical sprain. As for the female injuries 2 ankle sprains 2 knee injuries and 1 mentum laceration were recorded. The Greco-Roman style involved 3 nose contusions, 1 eyebrow laceration and 2 shoulder dislocations. The incidence of injury was 8.85%. In this study we analyze the type of injury per wrestling style, sex, category, body location and side.

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