

Modern Trends in Physiotherapy Support of Sports Activities and Rehabilitation Practice in Sports (on the Example of the University Clinic)

Współczesne trendy w fizjoterapii wspierające aktywność sportową oraz metody rehabilitacji w sporcie (na przykładzie uniwersyteckiej kliniki)

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SUMMARY

Aim: To form an idea about the necessity of introduction in sport training of sportsmen of modern physiotherapy and rehabilitation technologies on the example of work of university clinic.

Materials and Methods: Theoretical analysis and systematization of data of scientific-methodical literature, data of Internet network, as well as research of experience of activity of university clinic and center of sports preparation of highly skilled sportsmen.

Conclusions: The work of the multidisciplinary rehabilitation team plays an important role in the restoration of athletes, so their choice should be more individualized with the aim of more effective restoration of functional capabilities of athletes' performance. The influence of training and competitive loads on the athlete's body is quite diverse and can cause various appropriate reactions, which are largely determined by the functional state of his body. The effectiveness of the restorative effects is closely related to the initial functional state, and the same procedures, can both accelerate recovery processes and be an additional burden on the body. That is why the development and implementation of scientifically based recommendations on the methodology of training of high-qualified sportsmen on the basis of analysis of modern achievements of medical science and results of own scientific researches is one of the main tasks of this team.

Key words: multidisciplinary team, highly qualified sportsmen, university clinic, physiotherapy technologies, rehabilitation measures

Słowa kluczowe: zespół multidyscyplinarny, wysoko wykwalifikowani sportowcy, klinika uniwersytecka, technologie fizjoterapeutyczne, środki rehabilitacyjne

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INTRODUCTION

Recently, interest in sport, strong health and physical activity has increased significantly. One of the necessary conditions of life is physical activity, which has not only biological, but also social importance. It is considered as a natural-biological need of a living organism at all stages of ontogenesis. The problem of sound health in sports is mainly connected with the efficiency of the physical education system. However, although physical exercises have an extremely powerful and wide range of health-improving action, health of sportsmen is determined by a huge number of different factors, the range of which cannot be limited only to physical culture. Therefore, professional activity of highly qualified specialists should be directed on physical rehabilitation of the body of

sportsmen by means of a complex of various factors, where physical culture acts as one of the main links in the chain of health-improving means. Knowledge of means, methods and systems of health improvement for highly qualified sportsmen gain special weight, as they can be used both for preservation and strengthening of own health, and in the process of further professional activity.

To achieve victories of domestic sportsmen at the most important international competitions from physical therapists requires not only use of knowledge, but also improvement and formation of technologies of their use. The need to improve the efficiency of the implementation of scientific achievements, scientific and technological progress, advanced experience of modern physiotherapy and rehabilitation measures in sports

practice makes an important component of the system of training highly qualified athletes.

AIM

The purpose of the research is to form an idea about the necessity of introduction in sports training of sportsmen of modern physiotherapy and rehabilitation technologies on the example of work of university clinic.

MATERIALS AND METHODS

Theoretical analysis and systematization of data of scientific-methodical literature, data of Internet network, as well as research of experience of activity of university clinic and center of sports preparation of highly skilled sportsmen. were used for achievement of the goal.

REVIEW AND DISCUSSION

Implementation of physiotherapy and rehabilitation support of sports activity became possible with the availability of accessible use of university clinic and clinical bases of medical institute, as well as center of sports training of highly qualified sportsmen in Sumy State University (SSU).

The university clinic is a modern, equipped, accredited health care institution of a polyclinic-outpatient type, on the basis of which the provision of highly qualified medical care, a wide range of medical, physiotherapy and rehabilitation services, individual approach, friendly atmosphere and high quality of service is carried out. It is a health care institution, which is a medical, educational and scientific structural subdivision of SSU.

The university clinic includes a multidisciplinary team, where the reception is conducted by highly qualified specialists - doctors and candidates of medical sciences, professors, associate professors, well-known specialists in Ukraine and abroad. In the rehabilitation process to achieve better and more effective results in the shortest possible time, reduce complications and the degree of disability of athletes during or after training, competition or in between, it is necessary to carry out the rehabilitation process by a multidisciplinary team [1, 2].

A multi-disciplinary team is a group of specialists of different specialties who provide rehabilitation services to athletes to ensure restoration or compensation of existing limitations of life activity. The multi-disciplinary team, in particular, may include: physical therapist; ergotherapist; doctor of physical and rehabilitation medicine; doctor-neurologist; psychologist; specialist in social work/social worker; doctors of other specialties and specialists of educational or social sphere (if necessary).

The University Clinic works in conjunction with the Department of Physical Therapy, Occupational Therapy and Sports Medicine of Sumy State University, which employs specialists in physical rehabilitation, which allows them to work in a multidisciplinary team. It should be noted that on March 25, 2019, amendments were made to the order of the Ministry of Health of Ukraine dated October 28, 2002 № 385 «On approval of lists of health care institutions,

doctors, pharmacists, junior specialists with pharmaceutical education, positions of health professionals and positions of specialists in the field of health care in health care institutions», which introduced new positions, namely: physical therapist, occupational therapist, assistant physical therapist and assistant occupational therapist, which already allows health care institutions to form multidisciplinary rehabilitation teams [1].

In the rehabilitation process, the most important stage is the preparation of an individual rehabilitation program, which is a complex of optimal species, forms, volumes, terms of rehabilitation measures with the determination of the order and place of their implementation, aimed at preservation, improvement and compensation of broken or lost functions of the organism and abilities of a specific person. And it is the multidisciplinary team that has a key role to play, as the preparation of a high-quality and effective individual program requires a comprehensive approach.

Each specialist of the multidisciplinary team should develop its part of the program so that it can then comprehensively address the patient's rehabilitation tasks, and its activities simultaneously complement and reinforce the activities of each other. Therefore, it is important that both developed countries of the world and Ukrainian health care institutions ensure the formation of multidisciplinary rehabilitation teams and the use of multidisciplinary approach in the rehabilitation process, which will ensure reduction of complications, fatal accidents, repeated hospitalization and, respectively, costs for treatment and care of patients.

The State Oriental Center for Olympic Training of Athletes of Ukraine has been established on the material base of the university, in which highly qualified student-athletes and coaches of the university work in the national team of Ukraine in athletics. The largest number of sports-oriented students in the sections of light athletics. Students-sportsmen are the constant winners of regional and city student competitions, prize-winners and champions of All-Ukrainian Universiades. More than 100 students, masters, post-graduate students won about 200 awards at World and European Championships and Cups, World Universiades and Olympic Games. At the European university games SSU won the first place among Ukrainian universities by the number of medals.

27-28.01 – Indoor Athletics Championship of Ukraine. In the competitions on triple jump gold received Krasutska Anna, and in the race for 800 m champion was Hutsol Yevhen.

06-11.02 – Indoor Athletics Championship of Ukraine. SSU students won 24 awards, 8 of which were gold. The champions were: Sergienko Oleksiy, Malykhin Vladyslav, Mucharova Yevhenia, Tokar Anastasia, Shishnyak Anastasia, Mykolenko Maria, Hutsol Yevhen.

29.04 – at the 10 km Championship of Ukraine, Kaluzhna Victoria won and qualified for the European Cup in London.

05.07 – Open Championship of Israel in track and field: Krasutska Anna became the second in three striations and fulfilled the standard for participation in the European Championship [3, 4].

As for serious injuries in athletics, it is quite rare. The main injuries of athletes are dislocations of joints, sprains and strains of ligaments, open and closed fractures. It should be noted that even for light damage the athlete often goes out of order for a few days, or even weeks, because after injury to return to training can only after full rehabilitation. According to experts, about 90% of sports damage in track and field athletics is the result of non-compliance with training and safety regulations. At the same time, according to statistics, if there is no coach in training, accidents happen four times more often. This statistic shows the particular importance of the coach in the prevention of sports injuries [3].

Most common injuries of the ligamentous apparatus – up to 35% of cases, and damage of soft tissues – up to 20%. Athletes who were engaged in short-distance running and hurdles, long jump and triple jump are under observation. In short-distance runners and in hurdles, injuries and diseases of the soft tissues of the ankle joint – calf muscles, Achilles tendon, sprains of the ligaments of the ankle joint, tendovaginitis and paratendonitis were observed.

The mechanism of these damages was that excessive stretching of muscular and tendon fibers led to re-stretching, since the margin of strength of this link of the musculoskeletal system (MSS) in athletes showed insufficient, which also led to macro and micro-breaks, and sometimes also tearing soft tissues. The causes of injuries were insufficient technical training of athletes, insufficient coordination in the work of muscles and unreinforced, adequate preparation, aspiration to show high results.

Rehabilitation, that is, restoration, as part of the complex system of rehabilitation treatment, acquires increasing importance in modern medicine, its great importance and in sports, especially for athletes, because injuries, especially in young age meet quite often, being the main reason of interruption in the training process, which consequently leads to a steady decline in the level of sports performance. The faster and more successful to restore sports efficiency, the less adverse consequences of injury.

An important feature of rehabilitation of sportsmen after injuries of the MSS is achievement not only clinical, but also functional recovery in order to ensure the possibility of inclusion of sportsmen in the training process without negative consequences for health and to achieve the fastest restoration of sports efficiency [1]. The process of treatment and recovery of sportsmen after injuries of the MSS is divided into three stages. I stage – medical rehabilitation (gentle). Stage II – sport rehabilitation (renewal). The third stage is the stage of sport training. The stage of sports rehabilitation requires scientific substantiation and has a decisive importance in restoring the special qualities necessary in the specific sport specialization. The main tasks at this stage are restoration of the general efficiency of the athlete and restoration of movement actions and skills in the chosen sport.

SSU Sports Medicine Center is established on the basis of university clinic and provides medical services to sportsmen of all categories, and also created educational and scientific center of sports medicine, which on contractual terms carries

out medical support of sportsmen, members of national teams of Ukraine, with application of measures of modern diagnostics and prevention of sports traumatism [4].

The work of the Center of Sports Medicine is to provide diagnostic, medical and scientific-methodical services of the Federation of Athletics of Ukraine, the East Center of Olympic training in athletics, students who had to get a admission in training physical education. The main tasks of the center are carrying out fundamental and applied scientific researches aimed at finding individual structural, functional, biochemical, molecular-genetic and psychological characteristics that can ensure achievement of the maximum possible results for each athlete; development and implementation of scientifically based recommendations on the methodology of training of high-qualified sportsmen on the basis of analysis of modern achievements of medical science and results of own scientific researches; medical support of sportsmen during the training cycle, carrying out of measures preventing traumas and diseases of sportsmen, their treatment and rehabilitation, rendering of medical services, which contribute to increase of sports success.

According to the Center's tasks, its functions are: carrying out research works of the appropriate direction, including on contractual basis; development and search of existing innovative methods of medical support of the training process and their implementation in accordance with the normative base; providing clinical-diagnostic, rehabilitation and medical services to persons engaged in physical culture and sports; preparation of documents for admission (or dismissal) to physical training and sports for people who need them (sportsmen, students, schoolchildren); development of individual practical recommendations to sportsmen concerning programs of food, pharmacological support, restoration of mental and physical activity after intensive loads, simplification of adaptation to long perelotov and new climatic and geographical conditions in the place of carrying out of corresponding stage of preparation and main competitions; administration of the web resource with saved data on the health of sportsmen, indicators of their functional readiness and sports efficiency.

Development and implementation of scientifically grounded recommendations on the methodology of training of high-qualified sportsmen on the basis of analysis of modern achievements of medical science and results of own scientific researches is one of the main tasks of this center work [2].

The following complex scientific groups (CSGs) are established on a permanent basis to provide directions of work of the university clinic: CSGs on sports physiology and rehabilitation, CSGs on medical support, CSGs on implementation of research results in the training process, CSGs on molecular genetics, CSGs on IT-support.

It is known that during the training process it is important to correct dosage and choice of physical loading. For this purpose the functional state of sportsmen is assessed, which allows to control and adjust processes of urgent and long-term adaptation of the organism to physical loads, to reduce the level of risk of development of fatigue and overemphasis of

sportsmen as a result of application of maximum by volume and intensity of training and competition loadings.

Regulation defines the peculiarities of the activity of organs and their structures in a wide range of physiological and pathological reactions [3]. To train little positive effect, the body of an athlete must necessarily have a quality regulation of the work of internal organs, especially the cardiovascular system, so a number of studies are carried out – registration of the performance indicators of the musculoskeletal, cardiovascular, respiratory systems in a state of calm and during physical loads of different intensity, Determination of the influence of the central and vegetative nervous system on adaptation of the body in the course of training, carrying out of the relevant functional tests (variational pulsemetry, ECG, REG, RVG, EEG, spirometry, veloerhometria, daily monitoring of AT and ECG, functional loading testing); methods of study of higher nervous activity (HNA): tests for estimation of basic parameters of HNA, which determine personal, including psychological, characteristics of sportsmen (questionnaire, the time of a simple movement reaction, heating, tremor, coordination, etc.). research of neurodynamic properties of an organism (balance of nervous processes, strength and endurance of nervous system, functional mobility of nervous processes, peculiarities of intertaste asymmetry). After research, practical recommendations are developed to improve the system of scientific and methodological and medical and biological support of highly qualified athletes, taking into account the stage and period of sports training to reduce the risk of overexertion of athletes due to the maximum volume and intensity of training and competitive loads; basic methodological bases for assessing the level of mobilization of functional reserves of the body of athletes [3]. Also, general and individual models of functional readiness of highly qualified athletes for heavy loads during the competitive process are created and the functional and psychophysiological condition of athletes is monitored to assess readiness for training, to prevent overload and fatigue.

Based on the above mentioned, you can immediately note client orientation from the side of the university clinic. And there is no doubt that any patient can receive both help and the provision of appropriate conditions for rehabilitation and treatment for athletes are also available. Due to the fact that the clinic has a wide range of services, including medical examinations, outpatient surgery, massage, physiotherapy, MPT, Dentistry, types of diagnostics (ultrasound, laboratory diagnostics, CT, X-ray, functional diagnostics), it allows for full examination and consultation of doctors.

The main purpose of the rehabilitation of sportsmen is: elimination of mechanical symptoms and restoration of its functional state for the fastest return to normal physical loads; elimination of infringements of physiological functions; restoration of psychological status of the patient, his motivation; return of social and professional functions; activation of functional reserves of the organism [2]. Moreover, with the availability of technologies for physiotherapy and complex rehabilitation of the organism restoration will be achieved within a rather short period of time, of course,

taking into account the peculiarities and wishes of the patient (athlete).

In terms of technology, the clinic has an office, which contains devices for rehabilitation, among which we can highlight the universal suspension therapy cabin or rehabilitation cell, which is an important element of rehabilitation. It is designed for individual kinesiotherapy. Suspended therapy is a special suspended load system of the musculoskeletal system to restore the range of motion, normalize muscle tone and increase their strength, improve balance and develop coordination. You can use full suspension, active exercises with dosed resistance, and active exercises with support and use of a system of blocks and levers, elastic cords. With the unique method of suspended and block therapy (kinesiotherapy) it is possible to unload muscles, approaching to a state of weightlessness, and on need effectively to load them. Suspended therapy is effective even in cases where the patient cannot move independently in space. This effect is achieved by using a suspension system where the patient can move without fear of falling. With the help of the suspension system it is possible to unload and relax different groups of muscles and thus significantly reduce the pain syndrome.

The main indications in which this method of rehabilitation is used may be functional disorders of the musculoskeletal system (pain in the large joints and spine with functional disorders); restriction of movement in the spine and large joints (knee, pelvis, shoulder, elbow); strength and play types of sport and fitness (rehabilitation after injuries; training of functional strength, speed, coordination, endurance). And one can confidently say that thanks to the presence of such technologies, the rehabilitation of athletes will be achieved in a short time.

Everyone knows that swimming and lessons in the pool have a positive impact on the human musculoskeletal system, respiratory and cardiovascular system. As a result of pushing, the gravity of any body to the surface of the earth is weakened and the weight of the body is reduced accordingly [1]. Swimming pool is another feature of the University Clinic, which allows you to approach even more comprehensively in the case of rehabilitation and not only because, there is also the provision of aqua aerobics and hydrokinesiotherapy classes for children and adults. To engage in fitness or hydrokinotherapy in water, the ability to swim does not need. Exercises are performed at a shallow depth, where the water is approximately at the level of the chest of an adult. Moreover, thanks to aqua aerobics many people disappear fear of depth, and they get used to staying on the surface. In addition, there is a sports equipment available for the swimming pool, which is important both for rehabilitation and for ordinary classes.

Gidrokinesiotherapy is an excellent way to help athletes maintain their current level of physical training during the off-season or during post-injury rehabilitation. Injured athletes can use the features of the water environment such as swimming and water resistance during exercise. That is why they can restore functionality and cardiovascular endurance faster than it would have happened only in "ground"

therapy. Benefits for cardiovascular system were also found in training athletes in water, such as improvement of sports indicators from training of inspiratory muscles, including improved ability to breath during peak loading levels when returning to land after water exercises. It is worth noting that athletes often need to return to the training as soon as possible, and water provides a favorable environment in which early progressive functional training, as well as rehabilitation is conducted with the lowest risk of further repeat injury or aggravation of symptoms.

Taking into account the above, it is possible to assume that the swimming pool is one of the methods that allows to carry out rehabilitation of sportsmen, including aqua aerobics, hydrokinesotherapy and providing all opportunities for restoration of broken functions of the support-motion apparatus and other systems. Therefore, the University clinic provides these services for them, which helps to strengthen the state of the body of athletes and, of course, to develop sports and physical skills.

CONCLUSIONS

The work of the multidisciplinary rehabilitation team plays an important role in the restoration of athletes, so their choice should be more individualized with the aim of more effective restoration of functional capabilities of athletes' performance. The influence of training and competitive loads on the athlete's body is quite diverse and can cause various appropriate reactions, which are largely determined by the functional state of his body. The effectiveness of the restorative effects is closely related to the initial functional state, and the same procedures, can both accelerate recovery processes and be an additional burden on the body. That is why the development and implementation of scientifically based recommendations on the methodology of training of high-qualified sportsmen on the basis of analysis of modern achievements of medical science and results of own scientific researches is one of the main tasks of this team.

References

1. Acosta JD, Whitley MD, May L et al. Stakeholder perspectives on a culture of health: Key findings [Electronic research]. Santa Monica, Calif.: RAND 199 Corporation, 2016. http://www.Rand.org/pubs/research_reports/RR1274.html [date access 22.10.16].

2. Christian H, Zubrick SR, Foster S et al. The influence of the neighborhood physical environment on early health and development: A review and call for research. *Health & Place*. 2015;33:25-36.
3. Gozhenko A, Biryukov V, Gozhenko O, Zukow W. Health as a space-time continuum. *Journal of Education, Health and Sport*. 2018;8(11):763-777.
4. Scobbie L, Dixon D, Wyke S. Goal setting and action planning in the rehabilitation setting: development of a theoretically informed practice framework. *Clin. Rehabil*. 2019;25(5):468-482.

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Info

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