KINESITHERAPY IN SPORT

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Summary

Kinesitherapy in sport has several special features. It essentially differs from clinical rehabilitation in its principle and choice of the method. After undergoing kinesitherapy, a sportsperson, in addition to regaining physical ability to perform manual work in day-to-day life, can build ability to bear heavy physical loads in the selected kind of sport, which places heavy requirements on the functional state of different systems of a human body and, in particular, on stability of joints, their mobility, and on the fmuscle forces. It brings about a clear distinction between a normal “healthy” person and a sportsperson.

The techniques and methods used in each phase of kinesitherapy are determined by the nature of the desired result. The program of recovery after the same disease or trauma cannot be the same for an athlete, a football player, a skater and a gymnast. At the initial stage of medical rehabilitation development of the process of kinesitherapy one has to consider specific sports specialization of a traumatized person, so this process must have a selective specialized character.

Precise special features of recovery of professional activity of sportspersons, whose motor experience is much wider, than the people with other professions, require further development of programs of late rehabilitation at a transition stage to usual physical loads, typical for a sportsperson during a pre-traumatic period.

Kinesitherapeutic factors are an indivisible part of other physical factors. They are an obligatory structural component of complex physical therapy. Physical therapy and rehabilitation specialists must know and competently use corresponding

kinesitherapeutic means for prophylaxis, treatment and rehabilitation of sportspersons in different kinds of sport.

So far specialists have been discussing questions, concerning the place of kinesitherapeutic methods in the general structure of physical treatment and rehabilitation: compatibility and incompatibility of different physical procedures, specific order of their application, synergy of medical effects of different methods, especially for sportspersons.

1. Introduction

Modern sport is characterized by application of physical loads of great volume and high intensity, which sometimes do not correspond to adaptation reserves of the organism of a sportsperson and lead to overexertion. Improvement of sports results is caused by a trend to increase number of competitions, trainings, that in its turn leads to reduction of number of regeneration periods between trainings.

Intensification of a training process changes the state of the psycho-emotional sphere, cardiovascular and nervous-muscular systems of a sportsperson, causes further exhaustion development, a state of overtraining, high traumatism, chronic diseases, failures of training programs.

In the lives of many sportspersons arises a dramatic situation, acutely limiting sports career - a trauma or a disease. We do not belittle the advantages and merits of clinical rehabilitation, but currently development of extra-hospital direction of kinesitherapy of sportspersons is increasingly relevant and of paramount importance.

An analysis of scientific-methodical literature testifies to insufficient attention of specialists to the problem of kinesitherapy in a training process in different kinds of sport, especially in the most traumatic ones.

Of course, at the heart of all programs of kinesitherapy of sportspersons there are approved and widely applied techniques of stage-by-stage rehabilitation of a person after traumas and diseases of basic systems of a human organism.

At the same time, kinesitherapy of sportspersons essentially differs from rehabilitation of a common person and has a series of special features. Besides recovered ability to perform labor and household duties, a sportsperson after application of different techniques of kinesitherapy must be able to bear great physical loads in the selected kind of sport, making huge demands on stability of joints, their mobility, on the muscle forces; it brings about a clear distinction between a normal “healthy” person and a sportsperson..

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2. Definition of Kinesitherapy

Kinesitherapy (from Greek kinesis - movement, therapy - treatment) means treatment by active and passive movements, and curative gymnastics.

In scientific and scientific-methodical sources, there are several definitions of this concept; moreover, it is spelled in different ways (kinesitherapy, kinesotherapy, kinesiotherapy).

Instead of all these terms, in Russia, specialists use more often the term "curative physical culture, curative gymnastics" . Here the use of the term "kinesitherapy" started after the publication of the book of Bulgarian specialists "*Manual on Kinesitherapy*" in Russian. With reference to sport of supreme achievements, the term "physical rehabilitation" is more prevalent.

In modern medical practice, there is great number of methods of kinesitherapy; however, many authors of these methods, claiming supremacy of their techniques, reject other approaches. Diversity of clinical features of movement disorders (dyskinesia) implies a wide range of different available and applied forms and methods of kinesitherapy in medical rehabilitation. Kinesitherapeutic influence represents a huge complex of movements, determined as active-passive, arbitrary-involuntary, synergetic, assisted, trick, performed actively and passively, with the help of a kinesitherapeutist or with the use of mechanotherapy.

Specialists refer to two distinct basic branches of kinesitherapy: active kinesitherapy and passive kinesitherapy.

Active kinesitherapy is characterized by active and conscious participation of a patient, who independently performs corresponding suggested movements. This branch covers use of active physical exercises, labor motor activity, walking, as one of the kinds of the most automated motor skills, application of movements of usual day-to-day character. Specialists refer the following active specialized kinesitherapeutic methods to this branch: proprioceptive nervous-muscular simplification, a Yoga system, Callanetics, different programs of aerobics, applied at late stages of rehabilitation, hydrokinesitherapy, aqua-aerobics, etc.

Passive kinesitherapy covers forms and means, in use of which a patient participates passively, movements are performed by hands of an instructor-methodologist, by relatives of a patient or by special machines, devices, equipment, imitating common physiological movements (passive physiological exercises), or movements of individual tissues or parts of a human body are performed with the help of specially organized

methodical systems (massage, manual manipulations, mechanotherapeutic procedures, massage under water, electric stimulation and so on).

Kinesitherapy is included in a group of non-specifically acting therapeutic factors. Different means and forms of movements change general reactivity of a human body, increase its nonspecific resistance, suppress formation of vicious motor stereotypes, due to disease, or destroy them and form new, providing corresponding adaptation. Kinesitherapy is pathogenetic therapy. A greater part of diseases and injuries of the nervous system and locomotor apparatus is accompanied by disorder of motor function. For other diseases medical treatment requires subsequent bed rest and reduction of motor activity, leading to hypokinetic disorders. And only corresponding physical exercises help to cope with such problems. This allows considering kinesitherapy also as a specific therapy.

The primary tasks of kinesitherapy are the following:

- Recovery of motor functions or significant contribution to compensation of disordered motor function;
- Assistance to training of cardiovascular, respiratory and other systems (limiting physical efficiency),
- Restoration of human adaptation to everyday life and professional work;
- Formation of unwavering positive motivation to use different physical exercises further for life quality improvement.

Kinesitherapeutic factors are an indivisible part of other physical factors (natural factors and preformed physical factors). They are obligatory structural components of complex physical therapy. In this respect specialists in the area of physical therapy and rehabilitation should know and competently use kinesitherapeutic means for prophylaxis, treatment and rehabilitation of patients.

So far specialists have been discussing questions, concerning the place of kinesitherapeutic means in general the structure of physical treatment and rehabilitation: compatibility and incompatibility of different physical procedures, specific order of their application, synergy of medical effects of different means, especially for sportspersons.

In the existing literature we notice three distinct basic directions of kinesitherapy: treatment by keeping special positions of a human body, massage, and active-passive gymnastics.

Quite recently, applied kinesiology has appeared in the USA as a new approach to kinesitherapy. The founder of this branch of science George Goodheart was a sports doctor of the Olympic team of the USA. His publications were preceded by works of Kendall brothers studying the state of muscular system of patients with poliomyelitis. It is important to note that definitions of kinesiology, kinesitherapy in the treatment of Goodheart differ from conventional formulations in Russian science. The basic postulate, from which applied kinesiology starts - "a human body knows better than its owner and doctors what happens with it at the corresponding moment and what is necessary for its right work". A human body never lies, unlike its owner. A human body

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treats itself if a mechanism of treatment is in good condition and adjusted. Problems, requiring help of kinesitherapy specialists, arise due to disease and traumas.

3. The Most Prevalent Diseases And Traumas In Sport

Sportspersons know well those problems, which are connected with trauma consequences. After the simplest sprain of ligaments certain time is required to start trainings again. Any trauma (ligamentous disruption, fracture, displacement) always involves compelled immobility, intolerable for a sportsperson, beats him out from a usual rhythm of life, breaks down current and long-term plans.

The Table 1 represents the most prevalent diseases of sportspersons in 50 kinds of sport according to nosological forms.

Nosological forms	Number	%
Traumas and traumatic diseases of a locomotor apparatus	1489	44.05
Dental diseases	1031	30.50
Diseases of upper airways	287	8.49
Other diseases	177	5.25
Cardiovascular diseases	132	3.99
Gynecologic diseases	127	3.76
Neurologic diseases	88	2.60
Eye diseases	27	0.80
Lungs diseases	11	0.32
Proctologic diseases	8	0.24
Total:	3380	100.0

Table 1. Diseases of sportspersons in 50 kinds of sport according to nosological forms

This table testifies to unconditional prevalence of traumas of locomotor apparatus (LA) of sportspersons in comparison with diseases of other human body organs and systems. Obviously, this circumstance explains the greatest development of questions of prophylaxis and rehabilitation after traumas in different kinds of sport.

Most traumas occur in the so-called contact kinds of sport, and also those kinds of sport, where frequent start acceleration, sharp stops, jumps (basketball, volleyball, football, tennis) (Table 2) are inevitable.

Local injuries of different muscles are typical for sportspersons in the following kinds of sport: trapezius muscle (weightlifting, throwing, different kinds of wrestling); long muscles of back (sports gymnastics, diving, weightlifting, rowing); pectoral muscles (big and small), deltoid muscle, biceps muscle of arm and triceps muscle of arm (weightlifting, artistic gymnastics, different kinds of wrestling, volleyball, handball, badminton, acrobatics, skiing); rectus muscle of abdomen (artistic gymnastics, diving); quadriceps muscle of thigh (football, hockey, jumps, Rugby football, basketball, volleyball, acrobatics); adductor muscles of thigh (football, hockey, pole vaults, fencing, barrier run, slalom); a group of extensor muscles of thigh and flexor muscles of

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shin (football, sprint, barrier run, long and high jumps, artistic gymnastics); gastrocnemius muscle (run – all distance, jumps, fencing, boxing).

Kind of sport	Number of traumas	Kind of sport	Number of traumas
Basketball	998	Track and field athletics	295
Handball	814	Badminton	204
Volleyball	548	Table tennis	193
Field hockey	528	Tennis	147
Football	492	Swimming	123
Artistic gymnastics	399	Speed skating	79
Baseball	387		

Table 2. Number of traumas of young sportspersons, specializing in different kinds of sport, per 1000 sportspersons during a year

L. Micheli and M. Jenkins refer to the most prevalent traumas of tendons and muscles in common sports practice the following injuries: subcutaneous rupture of quadriceps muscle of thigh (typical for football players at missed ball hit); rupture of adductor muscles of thigh (gymnasts, acrobats); rupture of biceps muscle of thigh (football players at the moment of starting jerk, ball hit); rupture of gastrocnemius muscle (gymnasts, acrobats, sports games); rupture of a distal tendon of biceps muscle of arm (skilled gymnasts, trainers); Achilles tendon rupture (athletes).

Injuries of locomotor apparatus, in addition to purely biomechanical aspects, are a powerful and stressful factor, disrupting the right functioning of processes of homeostasis.

Health is of special value for sport, since it exerts direct influence on maintenance of correct integrative reaction of a human body to physical loads, and thereby - on sports efficiency, sports results and duration of going in for selected kind of sport. Functional rehabilitation of good quality for sportspersons after diseases and traumas, meeting requirements of each specific kind of sport, is an actual problem for the whole group of specialists in the related areas of sciences.

Analysis of large and diverse contingents of sportspersons has demonstrated, that due to prophylactic medical examination and constant medical control over sportspersons in the course of their training medical specialists register even slight symptoms (of diseases), manifesting mainly in conditions of application of great physical loads, which, as a rule, are not taken into account in the analysis of health of other categories of people (Table 3).

A significant number of traumas and diseases, in particular, of LA, take place because sport, especially sport of supreme achievements, involves complex problems of special adaptation and perfection of the organism of a sportsperson to maximum loads in conditions close to extreme. Introduction and propagation of differentiated techniques of preventive kinesitherapy for sportspersons (with different qualification) into their sports life lags behind the needs of modern sport.

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Disease	Frequency of appearance (%)	
	Sportsmen	People not going in for sport
Organic diseases of a cardiovascular system	–	1.1
Hypertensic crisis	4.2	10.6
Vegeto-vascular dystonia	3.8	7.7
Digestive apparatus diseases	2.9	5.6
Respiratory organs diseases		
Chronic tonsillitis	1.6	6.2
Scoliosis	–	12.5

Table 3. Comparison of frequency of appearance of some diseases of sportspersons and practically healthy workers of the same age

Traditionally in domestic scientific literature it is possible to distinguish five groups of reasons, causing traumas and diseases of sportspersons:

- Problems in organization and methodical support of educational-training courses and competitions;
- Unsatisfactory state of training facilities, sports equipment, tools, sportswear and sports shoes;
- Adverse sanatorium-hygienic and weather conditions during educational-training courses and competitions;
- Infringement of rules of medical control;
- Infringement of discipline and established rules by sportspersons during trainings and competitions.

Specialists attribute significant changes in the sphere of physical culture and sport over the past years, to commercialization of modern sport. Commercialization of sport has led to speeding up of training and preparation for achievement of record results in commercial starts, irrespective of special features of a specific period of preparation of a sportsperson, and to infringement of periodization of training cycles, i.e. to speeding up training irrespective of the current period of a particular sportsperson. All depends on terms and prestige of corresponding competitions, extensive application of means and methods (including the prohibited ones), stimulating sports working capacity. Persisting stress influence on sportspersons in the course of their sports activity in combination with accompanying external adverse factors can lead to rapid failure of adaptation of sportspersons and to appearance of adaptogenic pathology in their organisms. Development of acute traumas of sportspersons in professional commercial sport is a well-known phenomenon, not so typical for common highly qualified sportspersons.

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Biographical Sketch

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