

APPLICATION OF STRETCHING TECHNIQUES IN PHYSICAL REHABILITATION OF FOOTBALL PLAYERS WITH TRAUMAS OF UPPER AND LOWER LIMBS

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Abstract. *Purpose:* to study and experimentally test effectiveness of application of stretching as auxiliary not specific component of complex rehabilitation of football players with traumas of limbs. *Material:* experiment covered 186 sportsmen of 14-17 years old age. Quantitative indicators of limbs' traumas and damages were registered in competition and training processes during yearly macro-cycle by results of processing of official competitions' records and by medical records of football players. *Results:* application of stretching techniques in training process and in football players' physical rehabilitation permitted to reduce quantitative indicators of traumas of upper and lower limbs from 18 (season 2012-2013) to 7 cases (season 2013-2014). Indicators of football players trauma's relapses reduced by 7.93 %. In structure of upper and lower limbs' traumas of younger age groups indicators of lower limbs' traumas prevail. In older age groups traumas of upper limbs prevail. *Conclusions:* application of stretching techniques in football players' training process permitted to certain extent to optimize indicators of lower limbs' traumas.

Key words: football, players, stretching, rehabilitation, traumas, limbs, prophylaxis.

Introduction

Competition functioning in modern football is characterized by significant physical loads and rapid changes of situations in match. It significantly increases risk of traumas. By opinion of many researchers football is one of the most risk hazard kinds of sports (O. Nikanorov, 2013) [5]. In opinion of European specialists up to 60% of all sport traumas and injures, which require clinical treatment, are connected with training and competition functioning in football (S. Liugaylo, D. Scherbina, 2013) [8]. So, finding of effective means of motor functions' rehabilitation, increasing of neuro-muscular system's functional potential. Prophylaxis of traumas and their relapses is still a scientific problem.

In special literature, devoted to these problems, there are numerous mentioning of physical rehabilitation with limbs' damages of football players. Modern approaches to physical rehabilitation after injuring of knee joint's capsular ligaments were regarded in work by M. Parish, O. Nikanorov, 2011 [10]. The authors analyze the most characteristic reasons of muscular-skeletal apparatus's traumas in football. They showed modern approaches to physical rehabilitation of knee joint's capsular ligaments after operative treatment with arthroscopy method. They stressed that wide application of arthroscopy requires working out of physical rehabilitation complex programs. These programs shall reduce post operational complications and facilitate football player's stage-by-stage adaptation to training loads.

Application of plyometric trainings is a promising direction in football players' physical rehabilitation after traumas of knee joint's capsular ligaments, as it is noted by M. Cader, M. Parish, A. Nikanotov, 2012 [3]. But when using exercises of such type it is necessary to observe some requirements in order to avoid traumas' relapses. It concerns the following factors: 1) before practicing plyometric exercises football player shall fulfill special warm-up and stretching exercises; 2) these exercises shall be fulfilled with weight of own body; 3) load shall be increased gradually with correlation of work and rest in proportion 1:5; 4) joint of damaged capsular ligaments shall be rigidly fixed during fulfillment of exercise.

Usage of intended special means and rational sequence of their application in complex physical rehabilitation of football players' injured limbs is also effective. In dissertation of Chan K, 1997 [14] attention is accentuated on problems, which the author considers to be the most important: working out of system of complex, stage-by-stage rehabilitation of football players' special workability after traumas of lower limbs' joints; working out of rehabilitation training methodic for football players with after-effects of lower limbs' traumas; analysis and generalization of results of football players' with lower limbs' traumas at different stages of rehabilitation; formation of medical-pedagogic control system in process of physical rehabilitation of football players with lower limbs' traumas.

In researches of Kh. Mohd, M. Parish specialists' attention is accentuated on peculiarities of construction of physical rehabilitation program for sportsmen (on example of team sport games) who have injures of medial meniscus of knee joint. The worked out program differs from standard one by complex approach to sportsmen's with injures of medial meniscus of knee joint rehabilitation. The author's program contains list of means and methods, which influenced on condition of damaged lower limb's muscles, rehabilitation of psycho-somatic health, general and special workability. For the first time physical exercises for recreation of special motor skills of speed-power orientation, combined in plyometric training, were used.

The worked out physical rehabilitation program for football players has the following peculiarities: 1) early beginning of rehabilitation measures; 2) complex character of the used rehabilitation means and methods; 3) special periods and phases of physical rehabilitation; 4) system of long-term planning, including rehabilitation prognosis and terms of recreation; 5) system of dozing, operative control and correction of physical load; 6) experts' assessment of clinical-functional condition of sportsman and his ability to restore normal training process; Besides, under influence of physical rehabilitation programs football players demonstrated changes of myotonometry indicators [9].

Generalized theoretical and methodic approaches to sportsmen's rehabilitation are elucidated by authors [4, 7, 11, 12, 13]. These works contain modern views on physical rehabilitation process, brief characteristic of diseases and traumas; from clinical-physiological positions demand in physical rehabilitation usage in recreational treatment is shown. Also indications and counter-indications, terms, sequence and specificities of application of therapeutic physical culture, therapeutic massage and so on, are described. These researches permit for specialists in this field to work out intended complexes of physical rehabilitation measures and effectively apply them for sportsmen and sportswomen of different qualification.

In the present research stretching techniques have been regarded as auxiliary, non specific component of complex physical rehabilitation of football players with limbs' traumas. We also analyzed their effectiveness, variants of application in trainings process and in process of complex physical rehabilitation.

Purpose, tasks of the work, material and methods

The purpose of the work is to study and experimentally test effectiveness of application of stretching as auxiliary not specific component of complex rehabilitation of football players with traumas of limbs.

The object of the research is physical rehabilitation of football players with traumas of limbs.

The subject of the research is stretching techniques in complex rehabilitation of football players with traumas of limbs.

Material, methods and organization of the research: 1) analysis and generalization of literature data; 2) analysis of advanced pedagogic experience; 3) pedagogic observations; 4) analysis of competitions' official records; 5) analysis of football players' medical records; 6) pedagogic experiment; 7) methods of mathematical statistic.

The contingent of the tested included football players of children-junior sport school of football club (FC) "Metallurg" (Zaporozhye) – 186 sportsmen: – season 2012/2013: U-14 – 21; U-15 – 22; U-16 – 25; U-17 – 25; –season 2013/2014: U-14 – 22; U-15 – 22; U-16 – 24; U-17 – 25.

In season 2013/2014 complexes of stretching exercises, recommended by specialists [1, 19, 20], were introduced in training process and competition practice (children-junior sport school (CJSS) of FC "Metallurg" (Zaporozhye). Besides, these exercises were used by sportsmen, who passed course of physical rehabilitation after traumas of limbs.

Stretching exercises re used for consequent tension of certain muscular groups, their stretching and relaxation. It permits to increase joints' mobility by 5 – 12 % and preserve it during football match (about 90 minutes). Besides, stretching techniques positively influence on elasticity of muscles, permit to increase to some extent football players' workability [2, 15]. In specialists' opinion [16, 17, 18], systemic application of stretching techniques in football players' training is based on the following principles:

- stretching exercises are substantial addition to known forms of conditional training. They permit to prevent from tiredness, resulted from physical loads of speed-power orientation, which are characteristic for training and competition functioning in football;

- elasticity of muscles and ligaments is an important pre-condition for reliable development of football players' specific motor skills.

Results of the research

In our research stretching exercises were used in training process and physical rehabilitation of CJSS FC "Metallurg" (Zaporozhye) football players, who had injured upper or lower limbs, under control of football club's medical staff. Results of the research (see table 1) permit to state that application of stretching exercises positively influences on quantitative indicators of traumas. The highest influence was registered in group U-14: in season 2012-2013 there were 7 trauma cases were registered; in season 2013-2014 – 1 case. In other groups this influence was less expressive: U-15 – 2 cases of traumas in season 2012-2013 and 1 case in season 2013-2014; U-16 – 4 cases in season 2012-2013 and 2 cases in season 2013-2014; U-17 – 5 cases of traumas in season 2012-2013 and 3 cases in season 2013-2014.

Table 1

Quantitative and qualitative indicators of upper and lower limbs' traumas of CJSS FC "Metallurg" (Zaporozhye) football players in seasons 2012/2013 and 2013/2014 in performances in children-junior football league of Ukraine, n=18

Age category	Quantitative and qualitative indicators of upper and lower limbs' traumas			
	Season 2012/2013		Season 2013/2014	
	n ₁	%	n ₁	%
U-14	7	≈ 38.89	1	≈ 14.29
U-15	2	≈ 11.11	1	≈ 14.29
U-16	4	≈ 22.22	2	≈ 28.57
U-17	5	≈ 27.78	3	≈ 42.85

Age category	Quantitative and qualitative indicators of upper and lower limbs' traumas			
	Season 2012/2013		Season 2013/2014	
	n ₁	%	n ₁	%
Total	18	100	7	100

Notes: n – quantity of matches, n₁ – quantity of limbs' traumas

In analysis of research's results important role is played by indicators of correlation of upper and lower limbs' traumas of different age groups' football players, which are given in table 2.

Table 2

Indicators of correlation of upper and lower limbs' traumas of CJSS FC "Metallurg" (Zaporozhye) football players in seasons 2012/2013 and 2013/2014 in performances in children-junior football league of Ukraine, , n=18

Age category	Indicators of correlation of upper and lower limbs' traumas			
	Season 2012/2013		Season 2013/2014	
	n ₁	%	n ₁	%
U-14	3/4	≈ 42.86/57,14	1/0	100/0
U-15	2/0	100/0	1/0	100/0
U-16	3/1	75/25	1/1	50/50
U-17	3/2	60/40	1/2	≈ 33.33/66.67

Notes: n – quantity of matches, n₁ – quantity of limbs' traumas

Analysis of table 2 data shows that in season 2012-2013 there was certain trend: in older age groups correlation of upper and lower limbs' traumas was higher; in younger groups (U-14) – indicators of lower limbs' traumas were higher. After application of stretching exercises in training process in season 2013-2014, indicators of traumas in all age groups decreased (see tables 1 and 2). Besides, application of stretching permitted to avoid relapses of traumas in 7.93% of football players in season 2013-2014.

Discussion

At the beginning of the research we hoped to receive the data, which would prove effectiveness of stretching techniques' application in training process and in complex physical rehabilitation of football players. This assumption was based on fundamental researches in field of sport traumatology (P.A. F.Kh. Renstrom, 2003 [11]; V.M. Levenets, [4]) and physical rehabilitation (V.M. Mukhin, 2005 [7]). Besides, positive influence of stretching techniques in football players' training was frequently noted by domestic (K.L. Vikhrov, A.V. Dulibskiy, 2005) and foreign specialists (K.T. Chan, 1997).

We think that the formulated purpose of the research has been achieved not completely: the obtained data permit only to state the presence of trend to reduction of indicators of football players' traumas of limbs under influence of stretching techniques. Besides it is recommended to rationally use stretching as auxiliary non specific component of football players' physical rehabilitation. Its positive effect is based on stimulation of recreational processes in damaged muscular groups and improvement of organism's general condition. It is proved by the data of Kh. Mohd, M. Parish, 2012 [6] and O. Nikanorov, 2013 [8].

The above presented material permits to regard stretching techniques as auxiliary non specific component of complex physical rehabilitation of football players with traumas of upper and lower limbs and in training process. The received indicators should be regarded exactly as auxiliary factors, which facilitate improvement of health and creation of general positive background for application of physical rehabilitation's special techniques. Generalization, concerning direct influence of stretching techniques on physical rehabilitation of football players with injured limbs, requires deeper researches.

Conclusions:

The above given material permits to formulate the following:

1. Stretching techniques can be used in training process and in rehabilitation of football players with traumas of limbs as auxiliary, non specific component of rehabilitation process, which recreational processes and improve organism's general condition.
2. Application of stretching techniques in training process and in physical rehabilitation of football players

permitted to reduce quantitative indicators of upper and lower limbs' traumas from 18 (season 2012-2013) to 7 cases (season 2013-2014), indicators of traumas' relapses of football players of CJSS FC "Metallurg" (Zaporozhye) reduced by 7.93 %.

3. In structure of upper and lower limbs' traumas of CJSS FC "Metallurg" (Zaporozhye) in younger age groups (U-14) lower limbs' traumas prevail, in older age groups – upper limbs' traumas. Application of stretching techniques in football players' training permitted, to certain extent, to optimize these indicators.

The prospects of further researches in this direction are based on researches of effectiveness of football players' physical rehabilitation with complex application of traditional and non traditional methods; on determination of their rational correlation in physical rehabilitation process and its optimization for reliable recreation and avoiding of relapses.

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Conflict of interests

The author declares that there is no conflict of any interests.

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