

**THE RESULTS OF PHYSICAL REHABILITATION OF FOOTBALL
PLAYERS OF 18-24 YEARS OLD AFTER INJURIES OF THE ANKLE
JOINT**

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Purpose: to improve the results of physical rehabilitation of football players of 18-24 years old with intra-articular injuries of the ankle joint at the outpatient stage by optimizing and improving the effectiveness of differentiated application of rehabilitation measures involved in the training process.

Material and methods: this work was based on the results of observation of 36 football players, conducted at the clinic of the Medical Center "Mir Majid Erslan" in Beirut (Lebanon). We evaluated the effectiveness of physical rehabilitation: according to the scales LEFS, VAS, according to the questionnaire Euro Qol - 5D, according to the methods of A.V. Kalashnikov and NEER.

Results: these studies indicate that with a positive dynamics of changes in the functional state of the injured in both clinical groups, more pronounced and significantly better are the results obtained in the injured main group, who underwent physical rehabilitation according to our proposed program.

Conclusions: the analysis of the results of the study showed that with the positive dynamics of changes in the functional state of the injured both clinical groups more pronounced and significantly better results were obtained in the injured main group,

who underwent physical rehabilitation according to the proposed program. In addition, the injured in the main group at the same time and volume of observation, these indicators were better than in the control group.

Keywords: injuries of the ankle joint, physical rehabilitation, oriental massage, oriental bath, outpatient stage.

Introduction

The complexity of the anatomical structure of the ankle joint, poor protection of soft tissues lead to the fact that at systematic high loads and frequent traumatic actions, the mechanical strength of its elements is insufficient. Ankle injuries account for up to 15% of all joint injuries in general, with the main contingent of patients with this pathology - young people of working age, including athletes [1].

Analysis of scientific research and analysis of statistics on the nature and location of traumatic injuries of the musculoskeletal system of athletes in sports, in particular in football, shows that in the zone of significant risk in the musculoskeletal system is the ankle joint, which accounts for about 30-40% of this pathology [2,3].

The state of modern traumatology can allow already at the outpatient stage to integrate programs of complex application of means of physical rehabilitation of athletes directly into the training process.

Material and Methods of research

The study was conducted at the clinic of the Medical Center "Mir Majid Erslan" in Beirut (Lebanon) on the basis of the office of physical rehabilitation during 2016-2018. This work was based on the results of observation of 36 athletes involved in football. All injured athletes were male, aged 18 to 24 years. Athletes who were injured were divided into two equal clinical groups - the main and control group (18 injured athletes each). The main and control groups were identical in age, manifestations of functional disorders and localization of the received injuries.

The study involved injured with closed injuries of the ankle joint types A1, A2, C1 and C2 according to the classification AO / ASIF [4].

The duration of the injury ranged from 4 to 6 months, with athletes from both clinical groups undergoing rehabilitation treatment for the first time. Injured athletes of the main clinical group underwent a course of rehabilitation treatment in parallel with the resumption of the training process.

Injured I (control) groups received a set of rehabilitation measures according to the traditional physical rehabilitation program adopted at the clinic of the Medical Center "Mir Majid Erslan".

The victims of the II (main) group were offered a set of rehabilitation measures according to the program developed by us.

The injured of both groups immediately before the rehabilitation treatment and at its completion underwent initial and repeated examination - 30 days after its onset, which allowed to assess the dynamics of changes in the body's systems.

We evaluated the effectiveness of physical rehabilitation according to the method of A.V. Kalashnikov, NEER method, LEFS scale (The Lower Extremity Functional Scale) [5]. To study the dynamics of changes in the quality of life of injured athletes and the level of vocational rehabilitation, we used medical and sociological techniques, namely: visual analog scale VAS (Visual Analog Scale) [6] and the questionnaire Euro Qol - 5D [7].

Anatomical and functional results of treatment of injured athletes with intra-articular injuries of the ankle joint were evaluated using quality assessment standards for treatment of injuries and diseases of the musculoskeletal system, set out in the Order of the Ministry of Health of Ukraine №41 from 30.03.94 "On regulation of orthopedic trauma in Ukraine" in accordance with the changes proposed by A.V. Kalashnikov (2006) [8].

The digital material obtained during the study was processed using the general-purpose data processing software package Statistica for Windows version 6.0. Significance of differences between groups (comparison of average values for each group) was determined using Student's t test (t). The level of probability was taken as 95%.

Results of the research

Based on the analysis of modern and classical special literature, we proposed a clinical and physiological justification for the use of physical therapy, massage and physiotherapy in injured athletes with intra-articular injuries of the ankle joint, as well as created their own program of physical rehabilitation.

Injured athletes of group I (control) received a set of rehabilitation measures according to the generally accepted program of physical rehabilitation, adopted in the rehabilitation center of the clinic "Mir Majid Erslan".

Injured athletes of group II (main) received a set of rehabilitation measures in accordance with our proposed program of integrated use of physical rehabilitation.

Each injured athlete from both groups underwent initial and re-examination - before rehabilitation treatment, and at the end, 30 days after its start.

The program of physical rehabilitation of the injured of the control group consisted of 12 procedures of therapeutic massage of the injured limb, 12 procedures of magnetic therapy, 12 procedures of laser therapy and 24 classes of therapeutic exercises.

Magnetic therapy was prescribed to all patients - 1 session with magnetic field induction up to 30 mT. Laser therapy in all injured athletes was used taking into account the type of monochromatic radiation on the ankle joint and reflex zones, in a constant mode with a power of up to 25 mW for 15 - 30 seconds each, the total procedure time was 3 minutes.

Treatment of joint contractures was performed using the methods of classical therapeutic massage and conventional therapeutic exercises with increased range of motion at a slow pace. Mechanotherapy was not used in the physical rehabilitation program.

During the rehabilitation, the injured athletes of the main group received 12 training sessions with integrated therapeutic exercises, 12 bath procedures and 12 oriental massage procedures (Table 2).

Involvement of therapeutic gymnastics exercises in the training process was their integration into the structural parts of the training session, i.e. injured athletes began and ended the training together with the training of team players on the sports

field. Exercise exercises were performed directly on the training ground both separately and in combination with special football exercises with lightweight balls (with increasing difficulty, respectively). Special exercises were performed after exercise exercises, first for a healthy, then for an injured leg in the initial position sitting, standing, walking gradually.

Patients of the main group instead of a complex of physiotherapeutic procedures and massage were assigned a complex consisting of the combined use of the bath procedure of the conventional Arab bath and the procedure of oriental massage of the lower extremities. In the physical rehabilitation program, we used a modified procedure of the Arab-style Arab bath, common in the state of Lebanon, with "dry" heating of the steam room in the range from 45C ° to 60C ° and humidity up to 40%, without the inclusion of steam generators. This significantly reduced the load on the cardiovascular and respiratory systems of injured athletes and allowed more frequent and rhythmic use of this bath procedure in the course of physical rehabilitation. Before each procedure of steaming in the eastern bath, the patient's pulse, blood pressure were measured in the presence of a doctor, and the anamnesis of the condition was specified.

Previous hyperthermic effect on soft tissues and musculoskeletal system of injured extremities activated internal arterial hyperemia, increased elastic qualities of fibrous tissue, slightly reduced the threshold of pain sensitivity when performing amplitude movements, which allowed to effectively use the techniques of oriental massage of ankle joint. This has reduced the manifestations of both passive (structural) and active (functional) contractures of the injured joint.

Determination of functional indicators of the cardiovascular system before and after the course of physical rehabilitation showed that systolic, diastolic blood pressure and heart rate during the initial and repeated examinations were within normal limits, slightly increased in both groups. arithmetic mean values according to the results of measurements before and after the experiment using Student's t-test. The calculated value of the Student's t-test ($t = 2,4$) significantly exceeds the critical value ($t_{cr} = 0,19; 0,06; 0,2$), and the changes are not significant ($p > 0,05$), i.e.

significant changes in the state of functional indicators of the cardiovascular system of injured athletes of the main group during the study (30 days for each) did not occur.

From the analysis of the assessment of the results of physical rehabilitation according to the method of A.V. Kalashnikov shows that after the course of physical rehabilitation under the traditional program, the number of unsatisfactory results halved, the number of satisfactory results decreased by 22,2% and the number of good results doubled.

In the II (main) group, the data obtained indicate a significant increase in the share of good results, namely 2.1 times (up to 83,3%), which halved the number of satisfactory results (up to 16,7%), in the complete absence unsatisfactory results. This indicates the effectiveness of our proposed program of integrated use of physical rehabilitation.

Analysis of the results of physical rehabilitation according to the LEFS scale showed that after the course of physical rehabilitation according to the traditional program in the I (control) group the number of unsatisfactory results decreased by 11,1%, the number of satisfactory results did not change, and the number of good results increased slightly by 11,1 %.

The results of the evaluation of the data of the II (main) group convincingly show a significant increase in the number of good results, namely 6,5 times, and a significant decrease in the number of satisfactory results - almost 2,3 times. Of particular note is the decrease in the number of unsatisfactory results (almost 7 times), which shows the effectiveness of our proposed program of physical rehabilitation

The results of using the traditional physical rehabilitation program in the assessment of NEER in the I (control) group slightly improved, namely - the number of unsatisfactory results decreased by 5,6%, the share of satisfactory results decreased by 22,2%, due to a twofold increase in the share of good results - up to 55,6%

After a course of integrated use of physical rehabilitation for our proposed program, the results in the II (main) group significantly improved, namely - the

number of good results increased by 50% due to a significant decrease in the number of satisfactory results - by 27,8% and no unsatisfactory results after rehabilitation treatment

According to the EuroQol - 5D questionnaire for the traditional program in the I (control) group, the number of good results did not increase significantly - by 5,6%, obviously due to the same decrease in the number of unsatisfactory results, as the number of satisfactory results remained unchanged - 33,3 %

The use of physical rehabilitation under our proposed program allowed to significantly improve the results for the control group in the main, namely - the number of good results doubled from baseline to 88,9%, satisfactory - decreased 3,5 times and amounted to 11,1% , and unsatisfactory results were not found at all.

The indicator of VASH in I (control) group for 1 week after the beginning of rehabilitation improved and made $6,2 \pm 0,41$, on the 2nd and 3rd week its further improvement was noted ($5,3 \pm 0,37$ and $4,4 \pm 0,28$, respectively), and the maximum improvement occurred at 4 weeks ($2,9 \pm 0,22$), i.e. at the end of treatment ($p < 0,05$).

In injured athletes of the II (main) group, the values of VASH improved from 1 week of rehabilitation ($5,7 \pm 0,38$). There was a clear reduction in pain at 2 and 3 weeks, which corresponds to $4,3 \pm 0,23$ and $2,8 \pm 0,24$ points, respectively, and reached its best value of $1,3 \pm 0,18$ in 4 weeks from the beginning of rehabilitation. Statistical confirmation of the obtained data was performed by comparing the arithmetic mean values of the measurements before and after the experiment using Student's t-test. The calculated value of the Student's t-test ($t = 25,67$) significantly exceeds the critical value ($t_{cr} = 2,04$), ie changes in the condition of injured athletes according to VAS are significant ($p < 0,001$).

The pedagogical experiment presented in this study involved 36 injured male football players who received intra-articular injuries of the ankle joint. Thus, our studies confirm the data of J.M. Hootman et al. (2007), H.R. Champion et al. (2009) [9,10] on the frequency and statistical dependence of such injuries on playing sports in general and football in particular.

The localization of injuries of sports injury in the studied contingent, namely the ankle joint, confirms the data of Navarro Suay R. et al. (2012) [11] that the vast majority of cases of lower limb injuries in game sports are due to intra-articular injuries of the ankle joint.

The data of S.N. Popov (2013), V.V. Abramov et al. (2014) [12,13] on the effectiveness and necessity of integrating the physical rehabilitation program into the training process of athletes.

During the course of physical rehabilitation in the control group by the traditional method was a combination of several common methods, which confirms the data of S.A. Neborsky (2005), O.V. Nikitin (2010) [14,15] on the feasibility of a comprehensive approach to physical rehabilitation for athletes.

Our research results confirm the data of N.M. Valeeva (2004) [16] on the significant positive impact of rehabilitation treatment on improving the quality of life of injured athletes, as well as on the resumption of work, household and professional activities.

Developed and implemented massage procedure, which includes a combination of massage techniques of classical and oriental massage and the results of using the bath procedure as a non-traditional method of restorative treatment, had an objectively confirmed effect of mechanical action on muscles, tendons, capsular ligaments, which complements the data of A.A. Biryukova (2014), V.I. Vasychkina (2016) [17,18].

Conclusions / Discussion

It is well known that one of the most pressing problems of modern physical rehabilitation of injured athletes is the rapid and full return of their athletic performance.

It is also known from many scientific sources that injuries of the ankle joint (its ligament-capsule apparatus) are the second most common of all joint injuries, and the victims need long-term treatment.

In this case, it is advisable to argue only on the choice of treatment tactics depending on the nature of the damage to both the cartilaginous structures of the joint

and the soft tissues surrounding it. True optimization of the process of return of active athletes to active professional activity can find a positive solution only if new treatment technologies are added to the existing traditional methods and approaches to accelerate the recovery process. The author of the article developed and implemented a physical rehabilitation program, which was attached directly to the training process to solve the problem of speedy restoration of the proper functional state of qualified athletes and their rapid return to active professional activity.

Data from the results of the study of the effectiveness of physical rehabilitation on the LEFS scale, the methods of A.V. Kalashnikov and NEER when using physical rehabilitation according to the generally accepted program found 66,7% good, 22,2% satisfactory and 11,1% unsatisfactory functional results and 55,6% good, 27,8% satisfactory and 16,6% unsatisfactory functional results. Indicators of quality of life of injured athletes of the control group with intra-articular injuries of the ankle joint in the process of using the generally accepted physical rehabilitation program on the VAS scale and the Euro Qol - 5D questionnaire in 22,2% of cases are completely satisfactory, in 55,6% - only partially and in 22,2% of cases do not satisfy the injured athletes during the entire rehabilitation period.

The use of the program of physical rehabilitation according to the proposed program with injured athletes of the main group according to the results of the LEFS scale, the methods of A.V. Kalashnikov and NEER allowed to obtain 83,3% of good and 16,7% of satisfactory functional results, and 72,2% of good and 27,8% of satisfactory functional results. Analysis of quality of life of injured athletes of the main group with intra-articular injuries of the ankle joint in the process of integrated use of physical rehabilitation according to the proposed program on the VAS scale and the questionnaire Euro Qol - 5D showed 72,2% good, 22,2% satisfactory and 5,6% unsatisfactory results throughout the rehabilitation course.

The analysis of the results of the study shows that with the positive dynamics of changes in the functional state of the injured of both clinical groups more pronounced and significantly better results were obtained in the injured II (main) group, who underwent physical rehabilitation according to our proposed program

using integrated into the training process of therapeutic gymnastics, procedures of the modified ethnic Arab bath and consistent use of procedures with elements of oriental massage.

Prospects for further research. Implementation of the proposed program of physical rehabilitation of athletes with intra-articular injuries of the ankle joint with the use of integrated in the training process therapeutic gymnastics, procedures of the modified Arab bath and sequential use.

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