

Methodical features of physical rehabilitation of sportsmen with intra articulate injuries of ankle joint at the out-patient stage

Sharbel' Yusef¹
Denis Podkopaï²

¹Ministry of Sport of the state of Lebanon
²Kharkiv State Academy of Physikal Cuiture, Kharkiv, Ukraine

Purpose: the analysis of modern approaches to application of means and forms of physical rehabilitation of sportsmen with intra articulate injuries of ankle joint at the out-patient stage.

Material & Methods: the analysis of urgent special references on the problem of treatment and rehabilitation at intra articulate injuries of ankle joint.

Results: it is defined that together with the broad application of traditional complex techniques of medical physical culture, classical massage and physical therapy, the percent of use of nonconventional methods of non-drug therapy grows objectively and significantly in the last decade in physical rehabilitation.

Conclusions: the connected application of east bath and special techniques of east massage for rehabilitation of sportsmen with intra articulate injuries of ankle joint at the out-patient stage in special literature is described not enough that in turn demands the additional practical researches among methods of non-drug therapy.

Keywords: physical rehabilitation, intra articulate injuries of ankle joint, out-patient stage of treatment, procedure hydro-bathing.

Introduction

The most effective physical rehabilitation of sportsmen of game sports, in particular, basketball players and volleyball players, having damages and diseases of ankle joint, is intended to return sports working capacity them perhaps more fully. The ankle joint is difficult compound joint of human body, bears considerable loading, especially in sport and, therefore, it is often subject to traumatic damages [14; 16]. Complexity of anatomical structure, vulnerability soft tissues lead to the fact that the mechanical durability of its elements is insufficient at systematically high loads and frequent traumatic influences [20]. The main contingent of patients with injuries of ankle joint – people of efficient age, in particular, sportsmen.

According to data of N. L. Ankin (2002), injuries and fractures – 30–40% and to 12% among all pathology of the musculoskeletal system prevail in the characteristic of damages among injuries of ankle joint [2].

Damages of the ligamentous -capsular apparatus of ankle joint on prevalence make up to 15% among all injuries of joints. Intra articulate fractures of ankle joint make 1,5–4,0% among all fractures of bones of skeleton and 5–7% of all intra articulate changes [3; 7; 21]. Most of victims with such damages need prolonged treatment.

The review of the scientific research on the analysis of the statistical data studying character and localization of traumatic damages of the musculoskeletal system of sportsmen to game sports, in particular, in basketball and volleyball, shows that there is ankle joint, to which share about 15–20% of all pathology fall, in the zone of great risk in the system of mus-

culoskeletal system [9; 13; 22].

Unfortunately, the combined injuries of ligaments, articulate bag and articulate cartilage, which significantly differ from the isolated damages, are rather frequent, representing the special type of pathology demanding prolonged treatment and special rehabilitation in practice of sport, and at the same time considerable on the necessary volume of treatment and possible consequences [14].

Recently, arthroscopic operations at injuries of ankle joint gain ground [8; 15]. At the same time physical rehabilitation of sportsmen after such operations, especially at the combined injuries of ligaments and cartilage, is not presented more exhaustively by effective techniques. Due to this current situation, the development and scientific foundation of the comprehensive program of physical rehabilitation of the sportsmen, having injuries of ankle joint, is urgent for sports medicine and rehabilitation for today certainly.

Physical rehabilitation of sportsmen with intra articulate injuries of ankle joint at the out-patient stage with the differentiated application of various means and methods is the important stage which is logically finishing the whole cycle of treatment. The duration of the period of physical rehabilitation at injuries of area of ankle joint according to number of authors makes from 4 weeks till 6 months, and in some cases up to several years [4; 6; 17].

According to most of authors, the underestimation of importance of the rehabilitation actions directed to the restoration of function of the injured extremity in the entire periods of treatment and enough effective programs of physical rehabili-

tation of the sportsmen, who have especially transferred operative measure results lack of the integrated methodological approach to this problem in practice in results, when function of ankle joint, is restored in full only at 50–60% of victims, and disability reaches 1,2–5,5%. Both long terms of postoperative treatment and rather high percent of unsatisfactory functional results testify to it [1; 2; 12; 24].

Communication of the research with scientific programs, plans, subjects

The researches were conducted within the dissertation researches according to the direction of the research work of the chair of physical rehabilitation and recreation of KhSAPC in the section “Physical rehabilitation in traumatology, neurology and orthopedics”.

The purpose of the research:

to define modern methodical features of the differentiated application of nonconventional means of physical rehabilitation for sportsmen with intra articulate injuries of ankle joint at the out-patient stage of treatment.

Material and Methods of the research

Methodical features of physical rehabilitation of sportsmen with intra articulate injuries of ankle joint at the out-patient stage became clear on the basis of the analysis of modern references on sports medicine, traumatology, and physical rehabilitation.

Results of the research and their discussion

The out-patient stage is considered as one of the sportsmen conducting in the landmark system of physical rehabilitation thanks to possibility of the broad combined application of traditional and nonconventional medical procedures now. As the main tasks, facing the mentioned stage, for sportsmen with intra articulate injuries of ankle joint and their consequences are considered: maximum restoration of volumes of functioning of ankle joint, return of athletic and coordination ability of the sportsman in respect of high-quality restoration of special movement skills of technique of sport, remission fixing, increase in immune and nonspecific resilience of organism, stimulation of mechanisms of adaptation, restoration in full sports working capacity etc.

The improvement of rehabilitation actions at the out-patient stage of treatment is perspective way of improvement of quality of treatment and obtaining effective results of physical rehabilitation of sportsmen with intra articulate injuries of ankle joint, and also the prevention of consequences of similar injuries for health and sports career of the sportsman [14; 23].

The concrete methods of nonconventional medicine and physical rehabilitation used in programs of rehabilitation of sportsmen with intra articulate injuries of ankle joint at the out-patient stage of treatment are still rather not allocated and in literature are discussed often fragmentary [8; 12; 15].

Similar programs of physical rehabilitation are developed by some authors, but often with insufficient or selective application of nonconventional methods which role at stages of physical rehabilitation is estimated insufficiently. Meanwhile,

the specific weight of nonconventional methods of non-drug therapy (reflexotherapy, phytotherapy, reflexotherapy, hydrobathing technologies, manual therapy, kinesiotherapy) in world practice significantly increases in physical rehabilitation and makes in some researches up to 70–80% [17; 19; 22].

Scientific assessment of role and efficiency of traditional and nonconventional means and methods of physical rehabilitation in programs of treatment of sportsmen with the injured joints is among the most important and professionally significant problems of sports medicine.

According to number of authors, the traditional means and methods of physical rehabilitation of victims with consequences of intra articulate injuries of ankle joint applied in evidence-based complex with nonconventional methods effectively warn complications and restore functions of the damaged bodies [13; 14; 19; 21].

It is possible to tell with confidence that the program of physical rehabilitation with the combined application of traditional and nonconventional methods of treatment in the system of physical rehabilitation of sportsmen with intra articulate injuries of ankle joint in the conditions of the versatile rehabilitation center at the out-patient stage can significantly increase efficiency of recovery of health of victims and reduce terms of their return to sports career.

Filling of programs of physical rehabilitation for sportsmen at the out-patient stage decides on intra articulate injuries of ankle joint by the accounting of extent of restoration of functions and provides use of generally blandly-training and training motive modes in the work of the versatile rehabilitation center.

Authors recommend options of the combined action of two or three nonconventional methods consistently or at the same time that considerably increases efficiency of physical rehabilitation, as the program of physical rehabilitation included in individual programs of treatment of sportsmen with intra articulate injuries of ankle joint.

The combination of the traditional and nonconventional methods of treatment included in individual rehabilitation programs of sportsmen with intra articulate injuries of ankle joint at the out-patient stage, their volume, structure and contents have to be defined by the clinical profile, stage and form of pathological process in organism. At the same time security of patients with techniques on the basis of non-drug methods of treatment can make more than 40%, and the highest security with nonconventional methods of treatment is applied more often at injuries of the extremities which are followed by injury of nerves (70%). The combination of several traditional and nonconventional methods of treatment is recommended that considerably increases efficiency of medical rehabilitation by drawing up the program of physical rehabilitation of sportsmen with intra articulate injuries of ankle joint in the conditions of the versatile rehabilitation center [22; 26].

It is suggested to consider the following by drawing up the program of rehabilitation of athletes with intra articulate injuries of ankle joint at out-patient stage of treatment traumatologists [8; 13; 21]: general condition of the patient, his psychological status; condition of bone tissue (degree of expressiveness of bone callosity, osteoporosis) and correctness of

union of bone fragments; character of the applied immobilization (plaster bandage, skeletal traction, osteosynthesis) and immobilization duration; condition of skin, sinews, ligamentous-copular apparatus, muscular tissue, vessels and nerves; the existence of damages of nervous trunks and vessels accompanying bone trauma; the existence and expressiveness of post-traumatic contractures.

As a result of studying of references, on the problem of physical rehabilitation of persons with intra articulate injuries of ankle joint, detailed consideration of questions of etiology, pathogenesis, the clinical and phasic course of traumatic disease, mechanisms of medical action of physical exercises, we defined features of formation of programs of physical rehabilitation. Similar programs provide appointment to the patient of the corresponding motive mode, the MPC complexes, procedures of massage and physiotherapeutic procedures [16; 24; 26].

Also, authors [5; 8; 13] consider that the post-traumatic period is clinically characterized by the restoration of anatomic integrity of bone (the process of consolidation of bone fragments comes to the end, the wound is epithelized). However, despite of the restoration of anatomic integrity, the obvious dysfunction of extremity is observed (muscular atrophy, rigidity in joints, cicatricial contractures, etc.), this period proceeds till the formation of secondary bone callosity.

The integral part of the educational-training process practically at all stages of training of sportsmen of game sports are massage and hydro-bathing procedures. Therefore sportsmen, as a rule, during sports career have sufficient experience of use of bathing procedures, as a rule, of the Finnish sauna and some other types of hyper thermal procedures [19; 26].

The sportsmen of the state of Lebanon, participating in our dissertation research, have long-term experience of use of techniques of hygienic soaring in ethnic east bath, the organism of these sportsmen since the childhood is better adapted to procedures of east bath. Therefore, we choose application of this bath and east massage as nonconventional methods of physical rehabilitation of volleyball players and football players with intra articulate injuries of ankle joint.

According to number of researchers [18; 19; 26], it is possible to use hydro-bathing procedures especially effectively in combination with classical or ethnic east massage. The hyper thermal procedure of east bath and east massage as method of restoration, hardening, prevention of diseases and typical injuries has the great practical value for sportsmen of game sports. Combination of procedures of bath and massage, according to number of authors [19; 25], it can be used for the purpose of acceleration of restoration of volume of mobility of ankle joint, optimization of reparative processes in connecting and bone tissue, and also preparation of muscles, joints and organism in general to the increasing exercise stresses of the out-patient stage of treatment.

The significant increase in blood-groove in vessels promotes the acceleration of metabolic exchange in organism that leads to the acceleration of recovery and reparative reactions. The bathing procedure allows for a short time and in large numbers to bring infiltrate out of tissues. Bathing procedures, promoting increase in volume of the necessary substances coming to tissues and some "sterilization" of skin wounds allow to accelerate healing of injuries, bruises, changes, stretching,

absorption of hematomas.

Application of the bathing procedure allows bringing actively out of organism infiltrate, products of exchange and toxins without application of medicines and allows reducing the rehabilitation period after injuries, and also allows shifting focus of improving and medical procedures from the medicamentous to the physiotherapeutic area [18].

In the general opinion of authors, the poll about possibility of application of the bathing procedure to sick sportsmen after diseases and injuries is solved the doctor. This question is especially important for high-class players as the long absence of loads leads to detraining. Together with the doctor, rehabilitologist creates the program of complex physical rehabilitation and defines the correct mode of stay in east bath, orientation of techniques and volume of impact of east massage. At the same time it is necessary to consider that the wrong mode of the bathing procedure or the wrong dispensing of the massage procedure can break the medical process and worsen the state of health of the sportsman. There is restriction in the purpose of east bath at associated diseases of cardiovascular and nervous systems. It is connected with rather volume impact on organism of the hydro-bathing hyper thermal procedure that at not rather thought over purpose of these means in the program of physical rehabilitation can lead to deterioration in health [19; 25; 26].

Everything told results in need of the further theoretical development, the clinical approbation and the subsequent evidential description of efficiency of combination of traditional and nonconventional means and methods of physical rehabilitation, in particular the combined application of east bath and techniques of east massage for rehabilitation of sportsmen with intra articulate injuries of ankle joint at the out-patient stage of treatment.

Conclusions

1. The combined application of the traditional and nonconventional means and methods of treatment used in programs of physical rehabilitation of sportsmen at the out-patient stage in special literature available to us are discussed with intra articulate injuries of ankle joint rather fragmentary, at the same time role of such nonconventional means as ethnic types of massage and hydro-bathing procedures, it is in our opinion studied obviously insufficiently.
2. The standard techniques of MPC, massage and physiotherapeutic treatment remain the fixed non-drug assets of physical rehabilitation of sportsmen with intra articulate injuries of ankle joint at the out-patient stage in the conditions of the versatile rehabilitation center today.
3. As a result of the analysis of modern programs of physical rehabilitation for treatment of patients with intra articulate injuries of ankle joint at out-patient stage, it is defined that efficiency of application of nonconventional methods in physical rehabilitation, in particular the combined application of east bath and techniques of east massage, is studied not enough for today and demands additional practical researches.

Prospects of further researches. The data, which are received in this work, will be used in the subsequent scientific and practical work on the subject of the dissertation research.

Conflict of interests. The authors declare that there is no conflict of interests.
Financing sources. This article didn't get the financial support from the state, public or commercial organization.

References

1. Amirkhanov, I. M. (2006), *Lechenie dlitelnykh nesrashcheniy perelomov kostey goleni shtiftom s blokirovaniem* : Avtoref. kand. med. nauk [Treatment of nonunion of long bone fractures of the tibia pin blocking: PhD thesis], Moscow, 24 p. (in Russ.)
2. Ankin, H. L. (2002), *Prakticheskaya travmatologiya. Yevropeyskie standarty diagnostiki i lecheniya* [Practical traumatology. European standards of diagnosis and treatment], Kniga-plyus, Moscow, 480 p. (in Russ.)
3. Arkhipov, S. V. & Lychagin, A. V. (2000), "Modern aspects of treatment of posttraumatic deforming arthrosis of the ankle", *Vestnik travmatologii i ortopedii imeni N. N. Priorova*, No 4, pp. 64-67. (in Russ.)
4. (2002), "Biomechanical evaluation of clinical research at the load instability ankle syndesmosis" *13 nauchno-prakticheskaya konferentsiya SICOT: Tezisy dokladov* [13 scientific-practical conference SICOT: Abstracts], SPb, p. 195. (in Russ.)
5. Bogolyubov, V. M. (2006), "Medical rehabilitation or restorative medicine?", *Fizioterapiya, balneologiya i reabilitatsiya*, pp. 3-12. (in Russ.)
6. Vadakkadat, M. K. (2000), *Operativnoe lechenie bolnykh s perelomami lodyzhek po tekhnike gruppy AO-ASIF*: Avtoref. dis. ... kand. med. nauk [Surgical treatment of patients with fractures of the ankle in technique group AO-ASIF. PhD thesis], Moscow, 23 p. (in Russ.)
7. Vasilev, A. Yu. (2002), "Spiral computed tomography in the diagnosis of traumatic injuries of the ankle and foot", *Vestnik rentgenologii i radiologii*, No 2, pp. 34-38. (in Russ.)
8. Golubev, V. G. (2002), "Diagnosis and treatment of injuries of the ankle joint, complicated by post-traumatic phlebothrombosis", *Vestnik travmatologii i ortopedii*, No 3, pp. 79-82. (in Russ.)
9. Yepifanov, V. A. (2002), *Lechebnaya fizicheskaya kultura* [Therapeutic physical culture], Izd. dom «GYeOTAR-MYeD», Moscow, pp. 316-326. (in Russ.)
10. Yefimenko, P. B. (2007), *Tekhnika ta metodyka klasychnoho masazhu* [Technology and technique of classical massage], OVS, Kharkiv, pp. 148-156. (in Ukr.)
11. Kalyuzhnova, I. A. & Perepelova, O. V. (2008), *Lechebnaya fizkultura* [Therapeutic exercise], Feniks, Rostov n/D, 349 p. (in Russ.)
12. Kim, V. S., Kutsenko, E. N., Tarasova, Z. V. (2009), *Lechebnaya fizkultura. Massazh* [Therapeutic exercise. Massage], Kemerovo, 47 p. (in Russ.)
13. Kornilov, N. V. (2006), *Travmatologiya i ortopediya* [Traumatology and orthopedics], Gippokrat, SPb, 896 p. (in Russ.)
14. Krylova, L. M. & Nikishkin, V. A. (2009), *Reabilitatsiya v professionalnoy i fizikurno-sportivnoy deyatel'nosti* [Rehabilitation in professional and sports activity], MGSU, Moscow, 136 p. (in Russ.)
15. Mironov, S. P. & Cherkes-Zade, D. D. (2003), *Artrioskopicheskaya diagnostika i lechenie zastarelykh povrezhdeniy golenostopnogo sustava* [Arthroscopic diagnosis and treatment of chronic ankle injuries], Moscow, 132 p. (in Russ.)
16. Mukhin, V. N. (2005), *Fizicheskaya reabilitatsiya* [Physical rehabilitation], Olimpiyskaya literatura, Kiev, 471 p. (in Russ.)
17. Okamoto Hery. (2002), *Osnovy fizychnoi rabilitatsii* [Fundamentals of Physical rehabilitation], Halytska vydavnycha spilka, Lviv, 294 p. (in Ukr.)
18. Pidkopay, D. O. (2015), *Sportivnyy massazh* [Sports massage], Kolegium, Kharkiv, 176 p. (in Russ.)
19. Pravosudov, V. N., Sobolevskiy, B. I., Lutkov, V. F. & Tyurin, A. M. (1979), "Medical-hygienic aspects of the use of regenerative heat and gidroprotsedury", *Funktsionalnaya diagnostika i vosstanovlenie rabotosposobnosti organizma sportsmenov posle trenirovochnykh nagruzok*, Omsk, pp. 103-104. (in Russ.)
20. Prives, M. G., Lysenkov, N. K. & Bushkovich, V. I. (2005), *Anatomiya cheloveka* [Human Anatomy], SPb, Izd. dom SPbMAPO, 720 p. (in Russ.)
21. Semenisty, A. Yu. (2005), *Operativnoe lechenie i reabilitatsiya bolnykh s perelomami lodyzhek* : Avtoref. dis. ... kand. med. nauk [Surgical treatment and rehabilitation of patients with fractures of the ankle: PhD thesis], RUDN, Moskva, 16 p. (in Russ.)
22. Semenova, O. P. (2006), *Reabilitatsiya posttravmaticheskikh bolnykh* [Rehabilitation of posttraumatic patients], Feniks, Rostov n/D, 240 p. (in Russ.)
23. Popova, S. N. (2008), *Fizicheskaya reabilitatsiya* [Physical rehabilitation], Rostov n/D : Feniks, 602 p. (in Russ.)
24. Sharma, M. K. & Sharma P. (2009), *Artrit. Kak izbavitsya ot boli v sustavakh* [How to get rid of pain in the joints], Ripol Klassik, Moscow, 192 p. (in Russ.)
25. Brenke, R. (2006), Hydrotherapy and thermotherapy in the treatment of functional disorders, *MMW Fortschr. Med*, No 7, pp. 26-28.
26. Mikolasek, D. (1976), "Sauna v rehabilitacii", *Rehabilitacia*, No 9, pp. 27-35.

Received: 03.11.2016.

Published: 31.12.2016.

Yusef Sharbel': Kharkiv State Academy of Physikal Cuiture: Klochkivska str. 99, Kharkiv, 61058, Ukraine.

E-mail: frir@ukr.net

ORCID.ORG/0000-0002-4442-9509

Denis Podkopai: PhD (Physikal Education and Srort), Kharkiv State Academy of Physikal Cuiture: Klochkivska str. 99, Kharkiv, 61058, Ukraine.

E-mail: frir@ukr.net

ORCID.ORG/0000-0001-9845-7639