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Optimizing the Rehabilitation of Second Degree Ankle Sprains in Basketball Players by Associating Conventional Kinetotherapy Techniques and Unconventional Kinetic Techniques

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Abstract

A speedier reintegration of the basketball players in their specific activity after having suffered a sprained ankle will determine a decrease in the negative impact of ceasing the kinetic activity on the performance capacity and will contribute to continuing their specific activity in parameters close to the ones prior to the trauma. This goal can be achieved by a systematic approach of the individual in the rehabilitation process. This study addresses the entire rehabilitation process, starting with the diagnosis and till the reintegration in the specific activity. It isolates, modifies and selects external and internal factors with the purpose of following their influence on the studied phenomena.

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1. Introduction

The most important role in rehabilitation is played by kinesiology and its two components – therapy and prophylaxis – secondary and tertiary, and by its specific techniques - physical exercises, massage, mechanical therapy and electrotherapy, etc. and unspecific techniques. If in the Western view, the patient's approach is based on the biomechanical analysis of the movement and on inductive reasoning, in the Far Eastern perspective the movement encompasses the “subtle energetic component”. We consider that, regarding the ratio between conventional/unconventional kinetic techniques, namely a Western/Far Eastern type of approach, they complete each other; applying technical or scientific breakthroughs as well as reevaluating “ancient” therapies through new breakthroughs represents a current topic and the optimum solutions are those which increase the efficiency of the

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intervention. Both practical usefulness as well as theoretical substantiation is important in choosing a therapy (Bratu, 2011).

Medical rehabilitation in sports has a specific aspect generated on one hand by its particularities represented by the “focused use of a complex of natural or artificial factors, as earlier and as intensely as possible with the purpose of recovering the autonomous functions of an organ or a function disrupted by physical effort, so that the sportsman can be reintegrated as soon as possible in the training activity, and under optimum effort capacity”, and on the other hand by the biological and social context of the sportsman.

The ankle sprain represents one of the most frequent traumas in basketball. Most of the time it occurs by an indirect mechanism, namely a sudden twisting motion, a flexion or extension of joints, which catches the muscle mass in relaxation. Depending on the intensity of the trauma, the ligament can suffer not only a strain – the ankle remains stable, but it can also break involving its bone inserts – the ankle becomes unstable. The degree of joint instability also depends on the location of the injury.

Acupuncture has been widely used in the prevention and treatment for a variety of athletic injuries and to aid post-effort recovery. There are few controlled studies concerning its use, but many informal trials revealed positive results. As such, acupuncture is used by many trainers and athletes in order to achieve high-level performance and avoid injuries. Some studies have shown that acupuncture in athletes was associated with an increase in muscle strength and power, and also with an improvement in hemodynamic parameters (Ahmedov, 2010) Acupressure and reflexology, while using the same theoretical background (the Traditional Chinese Medicine paradigm) have been less monitored in controlled studies.

Chiropraxy and osteopathy, as methods involving manual manipulation for improving the spinal and joint alignment, have been monitored even less in controlled studies, but they also benefit from many informal reviews from coaches, physical therapists and athletes. Yumeiho is a similar method, with roots in TCM, less known and practiced than its western counter-parts.

The research hypothesis is as follows: we suppose that the optimization of the rehabilitation of basketball players' ankle sprains is a consequence of the use of conventional techniques specific to sports and kinetotherapy, dosed and iterated according to each case, and the proper association of unconventional kinetic techniques – Qi gong, reflexive therapy and Yumeiho, can increase the rehabilitation process which translates into the improvement of the somatic and functional parameters and the decrease of recovery time.

2. Methods

In this study we ensured specialized assistance – kinetotherapy/ kinetic prophylaxis to a number of over 400 basketball players over a period of 6 years, team members of Division A teams and of the National Male Senior Basketball Team of Romania, and we approached sports categories: seniors, juniors I and II. 70 of these have suffered post-traumatic disorders like ankle sprains in different degrees. However, in the interest of accuracy, the research is focusing only on second degree ankle sprains – 30 subjects (6 seniors, 12 juniors I and 12 juniors II), randomly divided into 2 groups – experimental (1) and control (2).

The subjects in the control group (2) have used in their rehabilitation only specific kinetic techniques, and those belonging to the experimental group (1) have added elements pertaining to unconventional techniques: Qi gong, reflexive therapy and Yumeiho (Bratu, 2011). While determining the therapeutic design, the following aspects have been analyzed: disorder and seriousness – clinical and functional diagnosis, action and physical, pathological mechanisms, somatic and functional particularities of the injured sportsman, biological response, progress rate, competition schedule, etc. The initial testing, which has been performed immediately after the removal of the restraints, has provided reference data for the subsequent testing and for determining the basic programs, adapted to every sportsman – structure, association, iteration, dosing and the frequency of the rehabilitation sessions. The intermediary testing has evaluated the biological response to treatment in view of adapting the therapeutic design to the patient's immediate needs. The final testing has been performed at the time

when we estimated that the somatic and functional state of the subjects allowed their reintegration in their specific activities and its goal was to determine the efficiency of the rehabilitation process. (Cordun, 2009; O'Sullivan and Schmitz, 1997)

The kinetic programs used in the rehabilitation of the second degree ankle sprain of basketball players have been structured in three stages: anatomical rehabilitation, functional rehabilitation and reintegration in the sports activity – specific and unspecific. The kinetotherapy started as early as possible and it was characterized by a coherent but flexible work methodology, with clear objectives and deadlines, based on a complete and precise clinical and functional diagnosis. (Bratu, 2004; Cordun, 2009; Surve, Schweltnus and Noakes, 1994). The objectives have been set according to theoretical and practical bases which quantify the data in our field of science. According to each stage, we pursued the following objectives: the reduction of pain and swelling, regaining the full range of motion, regaining muscle strength and endurance, regaining stability in the injured ankle, the gradual reinsertion in the athletic activities and the prevention of future injuries. The means used for the control group were the traditional ones: massage, positioning, manual mobilisation techniques, muscle strengthening and stability activities, sports-specific training. In the experimental group, Eastern medicine techniques such as Qi Gong, reflexive therapy and Yumeiho were associated, according to the same objectives.

The “local” rehabilitation program has been followed by the maintenance or the prophylaxis of the decrease in the patient’s effort capacity and the maintenance of the ideomotor images related to motor gestures specific to basketball (Cordun, 2009).

In order to assess the range of motion, muscle strength and stability and other therapeutic objectives, we used several tests and parameters: the global mobility factor, the muscle tone at rest, the contraction muscle tone, the pain during activity, the squat test and the duration of the rehabilitation process.

3. Results

By comparing the results obtained by the two groups regarding the evaluation of the parameters registered during research, we have aimed to determine the efficiency of the association of unconventional kinetic techniques to specific kinetotherapy techniques, but also the iteration in accordance with the objectives we have set during the rehabilitation process.

Hereinafter we present the results registered for the parameters we have followed comparatively for the two groups:

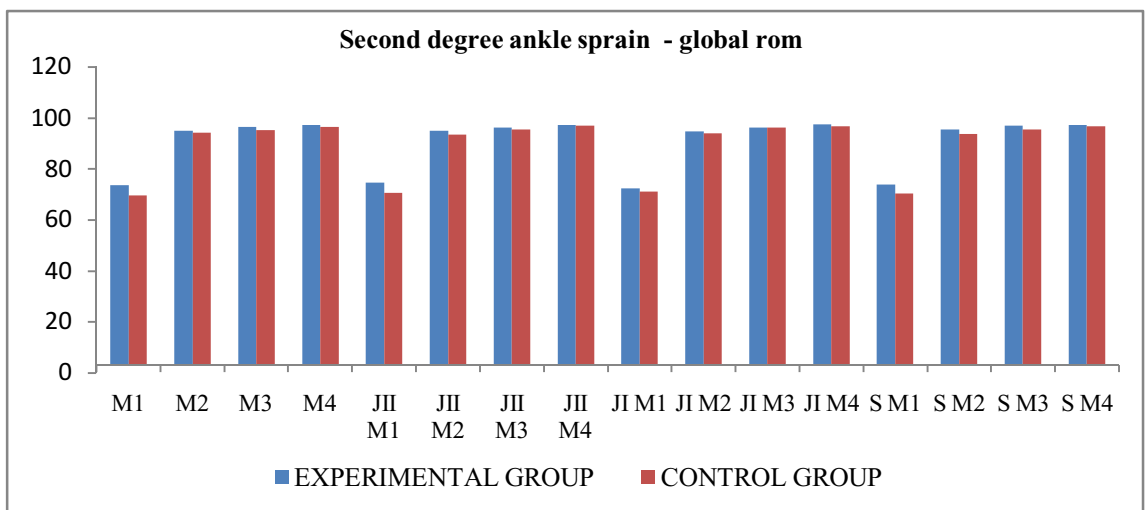


Fig. 1 Comparative analysis. GLOBAL ROM

The groups have been homogenous, and the $p=0.0001$, resulted after the calculation of the statistic significance test, rejects the null hypothesis. Without being spectacular, the differences between the two groups indicate a better evolution of the subjects who belong to the experimental group.

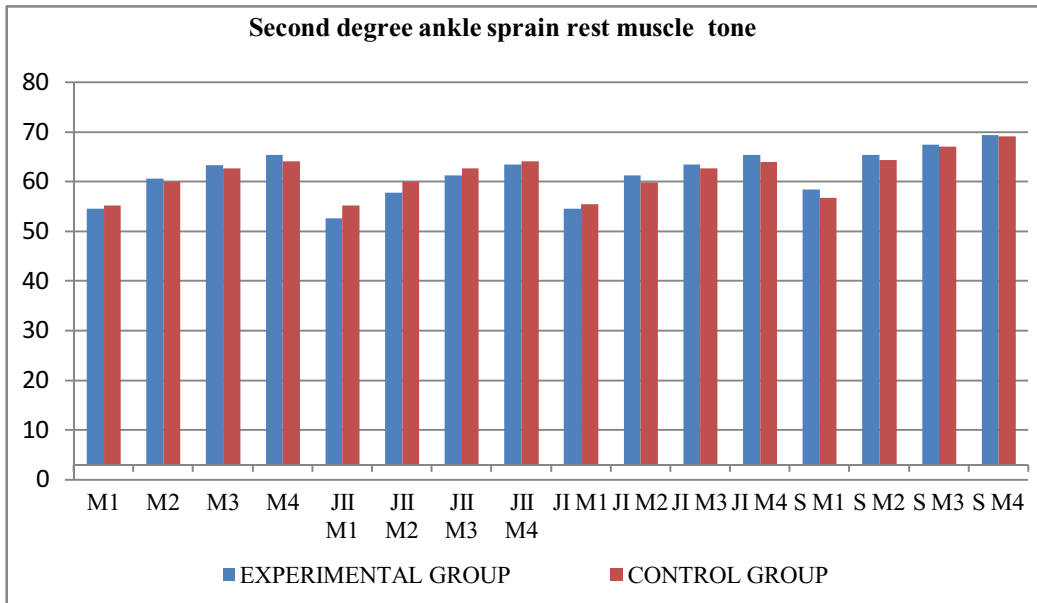


Fig. 2 Comparative analysis. Muscle tone at rest.

The evolution of this parameter is progressively increasing for both groups. The differences are noted especially in junior sportsmen while the seniors of both groups have had comparable values at point 3 and 4. The statistic significance test rejects the null hypothesis at a threshold of less than 0.01 ($p=0.0003$).

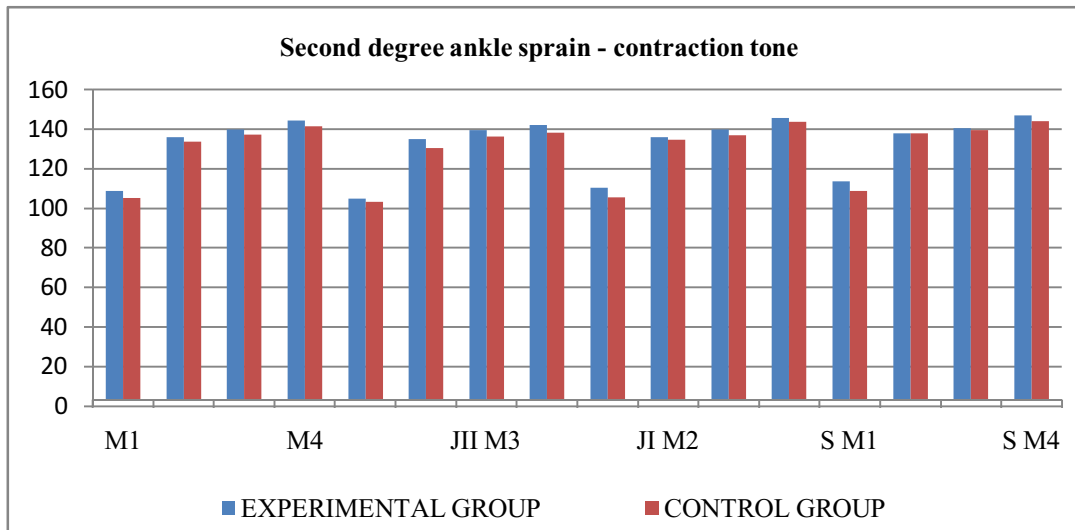


Fig. 3 Comparative analysis Muscle tone during contraction.

Without being significant, the differences in this parameter are also in favor of the subjects belonging to the experimental group. Thus, the differences at M1 are of 3.66us, at M2 2.4us, at M3 2.6us and at M4 2.93us.

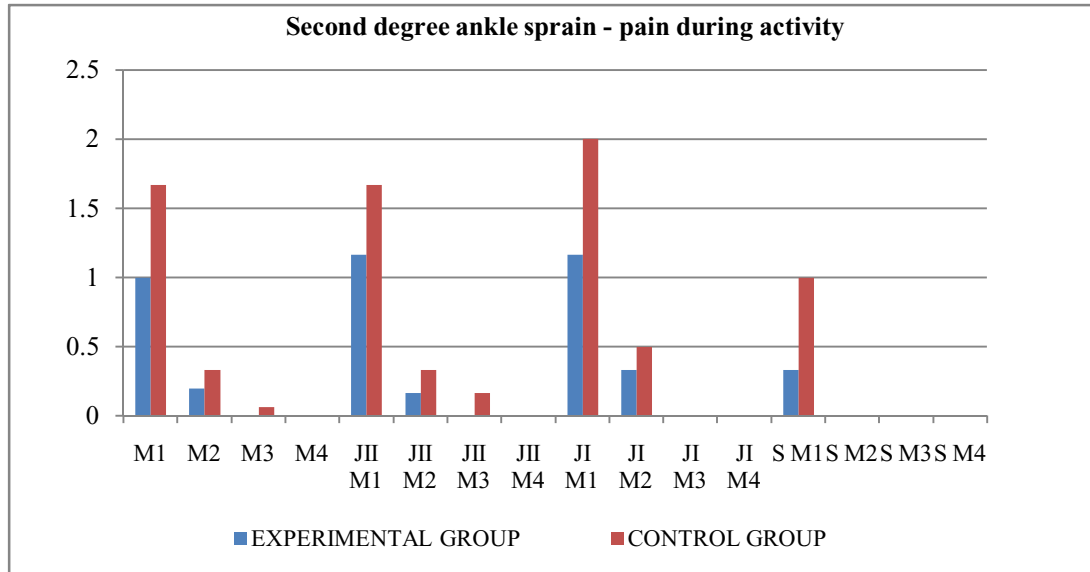


Fig. 4 Comparative analysis. Pain during activity

Significant differences are registered between groups at point M1 and M2. The most affected in both groups have been the junior II subjects. To be noted that the registered values are in favor of the experimental group.

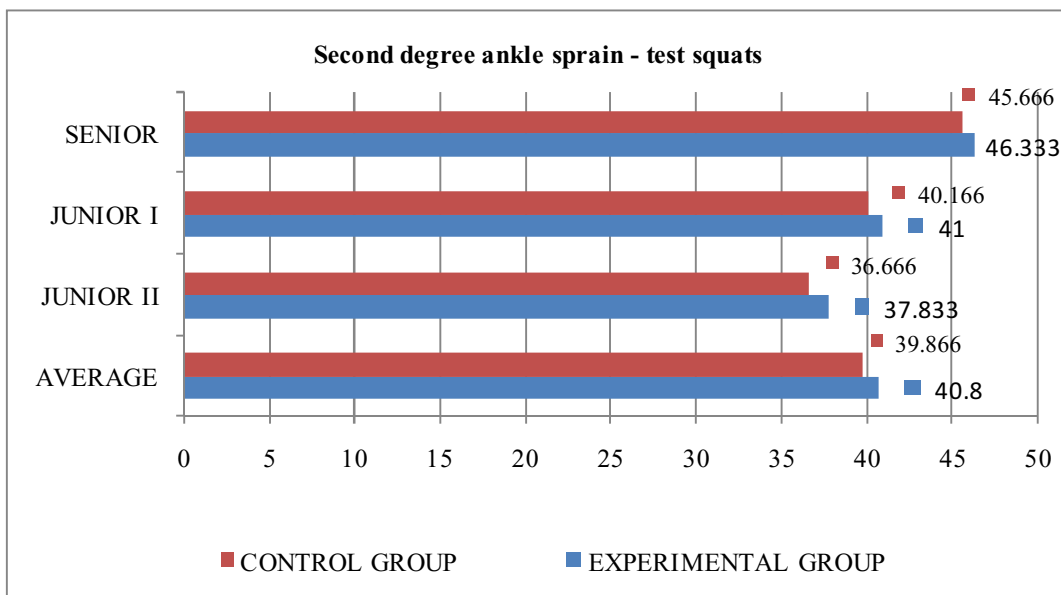


Fig. 5 Comparative analysis. SQUATS test

Differences are noted at all the age categories in both groups, in favor of the experimental one (seniors – 0.667, juniors I – 0.834, juniors II – 1.167).

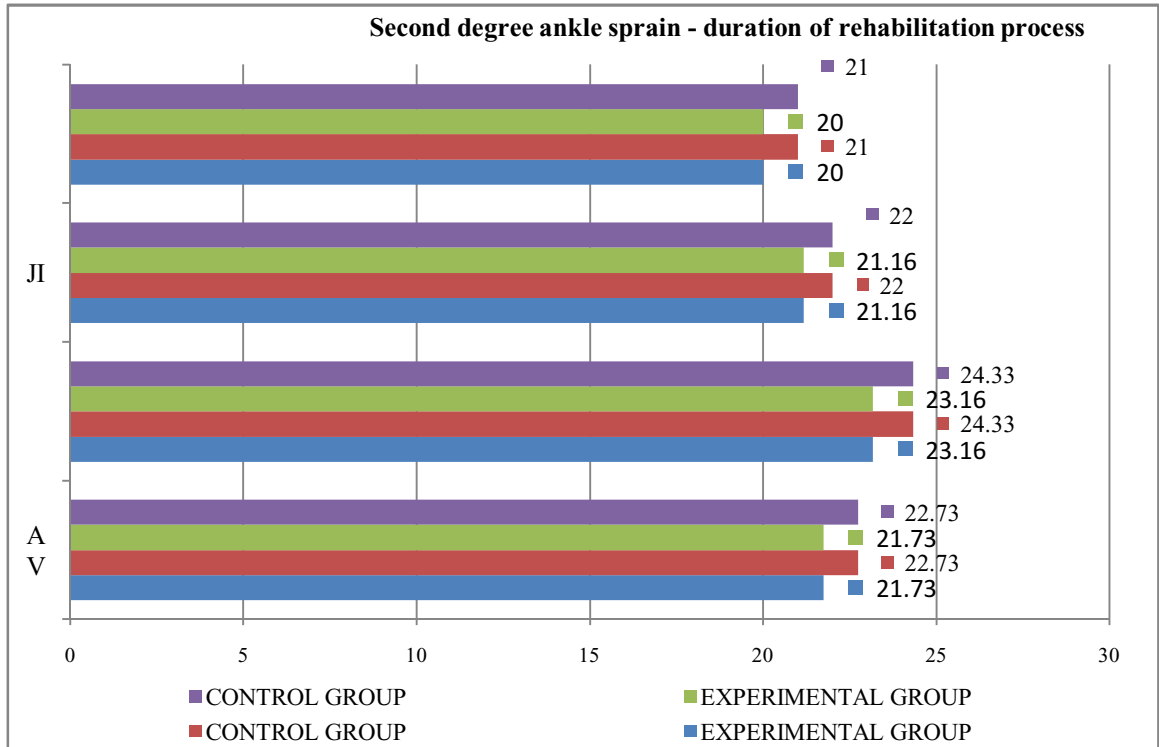


Fig. 6 Comparative analysis. Duration of the rehabilitation process.

The duration of the rehabilitation process has been between 19 and 26 days, with an average of 21.73 days for group 1 and between 21 and 26 days, with an average of 22.73 days for group 2. The differences between the two groups have been an average of 1 day in favor of the experimental group.

4. Conclusions

The results registered in the final testing of the subjects under study are statistically significant in favor of the experimental group for: the global mobility factor, muscle tone (at rest and during contraction), and the Squats test. Statistically significant differences have been registered in the case of the duration of rehabilitation parameter in favor of the experimental group, namely of those who have added unconventional elements to the conventional specific techniques: Qi Gong, Yumeiho and reflexive therapy, according to scientifically proven original protocols.

During the evaluation of the risk of relapse, we have taken into consideration the possibility of injury to the healthy segment, as a hyper protection reaction for the previously injured segment. We have noted that the injury during the competition season has occurred in a favorable number to the control groups, mostly in the lateral control segment.

The results we have obtained and expressed in work conclusions 1, 2 and 3 validate the hypothesis of this research. Thus, it is safe to say that the associated administration of conventional kinetotherapy techniques and

elements of unconventional techniques – Qi Gong, Yumeiho and reflexive therapy – during the therapeutic process of rehabilitating an ankle sprain in basketball players, according to the original patterns we've suggested, is beneficial and contributes to a speedier reintegration of the injured sportsman in the specific activity, at the best possible functional parameters and while diminishing the risk of “relapse”.

In the view of our findings, we can assert that using associated kinetic and manual techniques coming from the Eastern medicine, such as Qi Gong, reflexive therapy, Yumeiho and others, could provide a valuable aid in the prevention and treatment of athletic injuries, increasing the efficiency of traditional protocols and decreasing both the recovery time and the frequency of future injuries. Further studies and applications, both theoretical and practical could be valuable in monitoring and defining the influence of each associated technique as compared to traditional, well established approaches.

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