



Effects of immersion cryotherapy on post muscle fatigue recovery

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1 INTRODUCTION

Cryotherapy as a therapeutic resource has gained recognition, reflected in the wide use by physical therapists. By proving its physiological effects as being beneficial, it has acquired attractiveness, including directed to the sports field, represented by the well-known ice bath. This technique occupies considerable space in the perception of many athletes, unconsciously associated with early recovery, and primarily the elimination of fatigue. Recognizing the physical demands imposed by the practice of high intensity, it is up to the physical therapist in their work environment the competence to provide effective interventions through the knowledge of resources and techniques scientifically infused. In this sense, the reliability of the specific use of the complete or partial immersion technique on the commonly linked therapeutics must be deepened, inferring the outline of the desired conduct, which consequently will attribute more credibility to the general spectrum of physical therapy.

2 OBJECTIVE

The article aims to evaluate the efficacy of the cold water immersion technique, widely recognized in the field of cryotherapy, in order to relate its influence on one of the parameters related to muscle fatigue: the compound lactate, by testing serum concentration levels in equivalent periods.

3 METHODOLOGY

Through the use of two articles that present similar conducts of intervention by immersion cryotherapy, and the approach presented in systematic reviews, the following expanded bibliographic review was established referring to the productions found in the databases: SciELO, BVS (Virtual Health Library), PubMed, and articles present in the Brazilian Journal of Exercise Physiology, in English, Spanish, and Portuguese. Assuming an exploratory, descriptive and explanatory character, of applied nature, it seeks to establish a conclusion starting from the deductive method, through the



quantitative analysis of the results by the application of immersion cryotherapy in the reduction of muscle fatigue, and the qualitative assimilation of the pre-established physiological precepts in parallel to the targeted therapeutic use.

4 DEVELOPMENT

The analysis of the basic productions where the approach that produced the main questioning was carried out was established as follows: the participants of the experiments were divided into two main groups: immersion group (IG) and control group (CG), corresponding respectively to those who performed the immersion technique and those who were not influenced by it. We used the evaluation of serum lactate concentration levels before the activity, 3 minutes after and 15 to 20 minutes after a cycle of high physical exertion. As common inclusion criteria for the studies there is the need to be performing sports practices at least 3 times a week for a period equal to or greater than one year; as exclusion criteria the presence of physical alterations. After performing the application procedures of the different tests for hyperlactacidemia, followed by the application of the cryotherapeutic technique, a blood sample was collected to visualize the levels present. Complementarily to the content of the applications in the specified technique, the integration of experiments gathered and arranged in articles from different bases was sought, gathering conclusions established by authors that made use of the cryotherapeutic study in its functional variety, making possible the association or distancing of the objectives. Added to the general context, the physiological principles to be approached in the conclusion process are infused, which are a reference of the consequences resulting from the application of low temperatures in the human body.

5 CONCLUDING REMARKS

First of all, it is important to emphasize the absence of studies at a significant level that carried out the study of the conduct to investigate the problem established in this article, surprisingly negatively given the support conceived to the image of immersion in ice. The follow-up of the studies points to the efficacy of cryotherapy leveled to recovery in a passive format, by the synthesis of the effects attributed in the two main articles to the IG in reference to the CG there was no statistical significance, despite the variability in the time after induction of metabolic activity in a high intensity cycle; contrasting the idealized image of the ice bath as resolving the process involved in muscle fatigue. It can be observed in the studies a reduction in lactate concentrations in the active recovery of GI as well as in the CG that characterizes the passive recovery, and in one of the articles the absence of cryotherapy by immersion was more effective. In the literature the main physiological effect attributed to cryotherapy exercise is associated with vasoconstrictor response, translated into decreased



vascular flow, a concept that links the decrease in temperature to the use in acute cases approach preventing extensive inflammatory process; the present concept establishes the contradiction between vascular system efficiency and ice application. Thinking about lactate metabolism, its use as a parameter for muscle fatigue seems to be a consensus among most of the scientific community, for this reason the studies approaching the levels of the compound preceding and preceding the practice followed by the cryotherapeutic action were related. Additionally, the functionality of immersion cryotherapy in relation to the decrease of muscle activity by reducing the electrical activity involved in the contractile process of the fibers can be targeted in a similar conduct by following the approached reasoning, scientifically supported. Although the result points to inefficacy of the mentioned technique to solve the problem, it is of utmost importance to establish the retaking of the discussion by understanding the reasons that lead physiotherapists to disseminate applications of the opposite nature to the recommendations preceded by knowledge of physiology, influencing the extra-scientific community to adopt such practices; paying attention to the reputation of the professional exercise infused by proven hypotheses and the distancing of subjectivity linked to the perception of the patient in variable criteria understood as results. The implication of different factors such as immersion time, temperature, and rest time are variables to be considered, which were incongruent among the studies, and make it impossible to adopt a standardized systematic method. As characteristics adjacent to the process that may be researched, the physical level of the participants should be observed in relation to the practice or sport practiced, and its interference in the adaptation to intense stimulus, as well as the lactic production should also be measured, the interference in myosin and actin fibers. There is a wide range of implications, highlighting the need for further studies to address the topic.



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