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The Ice Water Immersion in Athletes. A Tool for Sports Physiotherapy?

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During physical exercise anatomical structure involved in locomotor are exposed to high levels of stress, these structures as muscle tissue, ligament, tendon, cartilage, behaved in a distinct manner and respond according to the first stimulus experienced [1].

The practice of physical exercise can cause muscular injuries which are characterized by muscle pain late-onset, caused due to rupture of muscle fibers [1,2]. These micro lesions or injury may range from an ultrastructural injury to the muscle fibers or even a complete injury with disruption of the muscle. With the presence of muscle injury leads to release of muscle proteins in the plasma and an immune response in acute phase and decreased physical performance leading to an inflammatory process [2].

The inflammatory process occurred by a muscle injury induced by performing a workout, develops initially due to rupture of the connective tissue on the own muscle cells adjacent myofibrils, the basal lamina adjacent to the plasma membrane, the plasma membrane of the muscle cell, sarcomere or plasmatic reticulum [3]. The inflammatory response resulting from the exercise or injury that occurs causes the appearance of excreted hydroxyproline and delayed release of CK and LDH enzyme [4]. The rapid development of muscle damage of connective tissue fibers and is accompanied by a dysfunction of intracellular components that spill into the interstitial and intravascular spaces. Many of these prostaglandins include substances which attract neutrophils and monocytes. Since the release of cytokines which aims to repair the damaged tissue, in particular cytokines with tumor necrosis factor-alpha (TNF-α) and interleukin-6 (IL-6), play important roles in repair damaged tissue [5].The release of TNF-α facilita leads the influx of neutrophils to the place where the muscle damage and is responsible for induction of phagocytosis of damaged tissue [5]. Promptly, IL-6 acts as a responsive cytokine modulating and activating energy pathways to support the inflammatory process [4,5].

A technique often used after muscle injury is cryotherapy which is defined as therapy by cold or cold therapy with the therapeutic objective of removing body heat by the application of ice or other means that lowers the local temperature, its benefits are provide vasoconstriction, decreased local metabolism, reduce the secondary effects of hypoxia, maintain local homeostasis, decreasing the effect of histamine, decreased pain, lower the local temperature reduction of edema, decrease in muscle spasm, acts minimizing the effects of the cytokine pro-inflammatory and miocina [6,7]. Since immersion in an ice bath which is well diffused in the sports field, The ice baths are usually applied at a temperature ranging from 1°C to 15°C, with time periods of between 10 to 30 minutes [8-10], particularly in post-training period where the benefits somatized search and potentiated the cryotherapy, still provides its mixed results and distinct, that make this technique still the subject of much discussion and numerous studies [8-11]. The understanding of the physiology applied to the athlete during immersion in ice bath, is mainly engaged to the sympathetic system, studies the effect on the immune system during muscle damage is the main pursuit of these studies [10,11].

Thus, immersion in an ice bath appears to be a major contribution tool for sports physiotherapy and for those professionals working in the area, but still needs further study and consensus in the scientific literature about its risks, contraindications and real benefits.

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