

P72 - AQUATIC THERAPY: REHABILITATIVE TOOL FOR MUSCULOSKELETAL DYSFUNCTION

Kelsick E.W.

MaxFit Movement Institute, Port Moody, Canada

Introduction: Aquatic Therapy (AT) is the application of therapeutic exercise in water. Its benefits include pain modulation; musculoskeletal rehabilitation (including proprioceptive and balance training), and fitness training. It speeds the physical rehabilitative recovery process allowing early movement and improves mental well-being. AT is one of the fastest growing areas of rehabilitation therapy. The benefits have been recognized since ancient times when whirlpools and hot springs were used to promote healing and treat ailments.



Relevance: Water provides buoyancy and viscosity. Buoyancy aids the body's movement while resisting gravity and significantly lowering the impact forces on the body. Viscosity, the thickness of water, produces 3-dimensional resistance to all movement. It is noticeable more strenuous to exercise in water than on land and simultaneously water substantially lowers the chances of further injury and pain. The temperature and pressure of the water also assist with the body's circulation and relaxation of myofascia tissue.

In addition compression forces of water reduces edema, and swelling in tissues while warm water increases circulation to the injured body parts.

Discussion: Strong scientific evidence exists to support the clinical and physiological benefits of AT in the management of connective tissue injury and rehabilitation. Recent evidence shows mechanical tensile stimulation can significantly improve stem cell proliferation activity in the fascia connective tissue. This is one possible mechanism of AT effectiveness. Water has the capacity to exert three-dimensional (multi-planar) mechanical forces on objects moving in it. Hence it's possible to hypothesize that the mechanical forces exerted on tissue moving in water could have similar effects on stem cells. Research is needed to investigate this hypothesis. However, the eccentric component of water forces is highly effective in the rehabilitation process. It is known that eccentric loading on muscle and tendon (connective tissue) physiologically enhances production (growth) and strength of these tissues through the process of mechano-transduction, microcirculation and growth differentiation factor/hormonal response. This eccentric component of water forces on a moving body can be very effective on the body's "fascia net" whose architectural design response according to the direction of strain loading applied to it. Connective tissue has the inherent ability that it is a highly adaptive. The fibroblasts within the tissue are able to adjust their matrixes remodelling capacity so the overall tissue architecture will respond to the load demands.

Implications: Aquatic therapy allows early weight-bearing by unloading the weight and stresses on the joints while providing supportive buoyancy to the body. The evidence shows that lack of movement promotes the development of additional cross-links in fascia tissue, which leads to a decrease in its elastic properties. Hence the need for reduces sedentary life style and early movement in rehabilitation.

Conclusion: There is extensive scientific evidence supporting the use of AT. Because of its wide margin of therapeutic safety and clinical adaptability of its medium, "water", aquatic therapy is a versatile and useful tool in the rehabilitation toolbox.

Keywords: Aquatic-therapy, Eccentric loading, buoyancy, viscosity, fascia-net