Aquatic Exercise for Patients with Osteoarthritis

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Abstract
Osteoarthritis (OA), also known as degenerative joint disease, is the most common type of arthritis, affecting over 30 million people in the United States alone [1]. OA affects both men and women and is listed as one of the most frequent causes of physical disability in the older adult population [2]. The joint pain experienced by patients with OA often results in decreased mobility and function which contributes to the weight gain, joint swelling, muscle weakness, and depression often observed in this population [3]. As a physical therapist (PT) and an occupational therapist (OT), we have both been exposed to many interventions supported in the literature to reduce pain and improve mobility in individuals with OA, including pharmacological, non-pharmacological, and surgical interventions [4]. This paper discusses the use of aquatic exercise as an option to improve mobility and reduce pain for people with OA.

Keywords: Aquatic exercise; Arthritis; Osteoarthritis

Back Ground
Osteoarthritis (OA), also known as degenerative joint disease, is the most common type of arthritis, affecting over 30 million people in the United States alone [1]. OA affects both men and women and is listed as one of the most frequent causes of physical disability in the older adult population [2]. The joint pain experienced by patients with OA often results in decreased mobility and function which contributes to the weight gain, joint swelling, muscle weakness, and depression often observed in this population [3]. As a physical therapist (PT) and an occupational therapist (OT), we have both been exposed to many interventions supported in the literature to reduce pain and improve mobility in individuals with OA, including pharmacological, non-pharmacological, and surgical interventions [4].

This paper discusses the use of aquatic exercise as an option to improve mobility and reduce pain for people with OA. OT and PT both fall within the non-pharmacological intervention category. According to Woods et al., the only non-pharmacological interventions offered by the European League Against Rheumatism (EULAR) for knee OA are the use of appliances like braces and insoles, and appropriate footwear, although these researchers found transcutaneous electrical nerve stimulation (TNS) to be an effective option. Aquatic exercise was not mentioned, and yet, this is a good alternative to pharmacological measures in the reduction of pain from OA.

Aquatic Exercise
According to the Academy of Aquatic Physical Therapy (AAPT), a section of the American Physical Therapy Association (APTA), aquatic therapy utilizes buoyancy and support, but can also offer resistance, enhancing exercise [5]. Hydrotherapy, or aquatic exercise, is often recommended for patients who suffer from the pain of osteoarthritis. This is attributed mainly to the weight-relieving property of water [6,7]. Additional pain reduction can be facilitated by manipulating water temperature to maximize the intrinsic benefits of endorphins and reduce the viscosity of the synovial fluid. The buoyancy of the water decreases the impact on the joints during exercise, offering assistance or resistance depending on the direction and speed of the movement. This gives a patient a little more security since falls are less likely. If a fall does occur, it does not happen as quickly. The increased reaction time offered by the water, provides the necessary training to improve balance over ground [8]. It also provides sense of control as the patient becomes the one-in-charge of the force needed for the activity, simply by changing the speed, the direction, or the position of the body part during the sweep through the water [9].
The Evidence

Water density is greater than air, a property called viscosity. This property can make you feel weightless due to the buoyancy, and can make you feel resistance, due to a property called drag [9]. Exercising in water help can help improve aerobic capacity, muscle strength, and balance [10,11]. Exercising in water has also been found to promote weight loss and improve body composition [12] Bartels et al. [13] performed a systematic review and found a small, short term improvement in pain and disability after aquatic exercise. Stover et al. [14], however, found a statistically significant decrease in reported pain and improved pain-free functional reach when comparing scores before and after an 8 week (twice per week) aquatic exercise program. Taglietti et al. [15] found similar results with improved Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC) scores for a group receiving aquatic exercise when compared to a group receiving only patient education.

Cardiovascular function can also be improved as a result of aquatic exercise. In a study exploring the cardiovascular effect of water walking, individuals with gait impairment demonstrated a training effect following 8-weeks of walking on an underwater treadmill, 3 times per week [16]. The improvement in exercise heart rate was similar to the adaptations observed in non-disabled populations. This suggests that the aerobic training demand is adequate to facilitate improvement, even with the body weight supported by the buoyancy of the water.

Conclusion

Although more research is needed to objectively calculate the benefits of an aquatic exercise program for OA using a Cochrane Analysis, few people will disagree that movement simply feels easier and more comfortable in the water. Decreasing the impact on sore joints will always be beneficial, allowing individuals with OA to exercise longer, building endurance, and eventually improving strength. This exercise in the water, when done over time, should eventually enable our patients to move, not only better through the water, but more efficiently through the air.

References