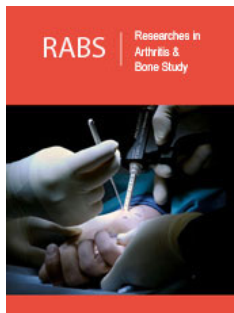


Aquatic Exercise for Patients with Osteoarthritis

Michaels NN^{1*} and Stevens S²

¹PT, EdD, GCS Emeritus, ATRIC, Professor, Belmont University, Nashville, TN, USA

²OT, PhD, Associate Professor, Middle Tennessee State University, Murfreesboro, TN USA



***Corresponding author:** Natalie N Michaels, PT, EdD, GCS Emeritus, ATRIC, Professor, Belmont University, Nashville, TN, USA

Submission: 📅 February 22, 2019

Published: 📅 March 15, 2019

Volume 1 - Issue 4

How to cite this article: Michaels N.N, Stevens S. Aquatic Exercise for Patients with Osteoarthritis. Res Arthritis Bone Study.1(4). RABS.000518.2019.

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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. 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. Exercise in the water offers a low impact option for exercise, with the soothing effects of buoyancy. This paper discusses the use of aquatic exercise as a non-pharmacological 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 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

1. CDC (2019) Osteoarthritis (OA). Centers for Disease Control and Prevention.
2. NIH (2017) Osteoarthritis. National Institutes of Health: National Institute on Aging.
3. Kim IS, Chung SH, Park YJ, Kang HY (2012) The effectiveness of an aquarobic exercise program for patients with osteoarthritis. *Applied Nursing Research* 25(3): 181-189.
4. Woods B, Manca A, Weatherly H, Saramago P, Sideris E, et al. (2017) Cost-effectiveness of adjunct non-pharmacological interventions for osteoarthritis of the knee. *PLOS ONE* 12(3): e0172749.
5. AAPT (2012) General FAQ's academy of aquatic physical therapy. Section of the American Physical Therapy Association.
6. Fransen M, Nairn L, Winstanley J, Lam P, Edmonds J (2007) Physical activity for osteoarthritis management: A randomized controlled clinical trial evaluating hydrotherapy or tai chi classes. *Arthritis Rheum* 57(3): 407-414.
7. Lin SYC, Davey RC, Cochrane T (2004) Community rehabilitation for older adults with osteoarthritis of the lower limb: A controlled clinical trial. *Clinical Rehab* 18(1): 92-101.
8. Stevens S, Caputo J, Fuller D, Morgan D (2015) Effects of underwater treadmill training on leg strength, balance, and walking performance in adults with incomplete spinal cord injury. *J Spinal Cord Med* 38(1): 91-101.
9. Woodford (2018) The science of swimming.
10. Breedland I, Van Scheppingen C, Leijmsa M, Verheij JNP, Van Weert E (2012) Effects of a group-based exercise and educational program on physical performance and disease self-management in rheumatoid arthritis: A randomized controlled study. *Phys Ther* 91(6): 879-893.
11. Carlson L, Greear A, Ellis B, Lamb A, Housel N, et al. (2013) Aquatic exercise for fall prevention in the older adult. *International Journal of Social Health Information* 5 (12): 53-62.
12. Ferrigan K, Hice J, Leemkuil K, Singer S, Charles C, et al. (2017) Aquatic exercise for weight reduction in middle aged adults: A pilot study. *Journal of Aquatic Physical Therapy*, 25(2): 16-21.
13. Bartels EM, Juhl CB, Christensen R, Hagen KB, Dagfinrud H, et al. (2016) Aquatic exercise for the treatment of knee and hip osteoarthritis. *Cochrane Database of Systematic Rev* 3: CD005523.
14. Stover A, Smith C, Maloney J, Mitchell C, Michaels N, et al. (2015) Aquatic exercise for pain reduction in the active older adult with osteoarthritis. *Journal of Aquatic Physical Therapy* 23(2): 13-19.
15. Taglietti M, Facci AM, Trelha CS, DeMelo FC, Da Silca, et al. (2018) Effectiveness of aquatic exercises compared to patient-education on health status in individuals with knee osteoarthritis: A randomized controlled trial. *Clin Rehabil* 32(6): 766-776.
16. Stevens S, Morgan D (2015) Heart rate response during underwater treadmill training in adults with incomplete spinal cord injury. *Top Spinal Cord Inj Rehabil* 21(1): 40-48.

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