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The Effects of Exercise on Quality of Life in People with Rheumatoid Arthritis

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INTRODUCTION

Rheumatoid arthritis (RA) is a chronic, systemic disease that results in bone and joint destruction, commonly effecting joints of the hands and feet, leading to pain and physical limitations. Because of these limitations, quality of life in patients with RA can be heavily impacted.[1] Quality of life (QOL) is described as the standard in which a person or group experiences happiness, solace, and a sense of well-being.[2] QOL may be affected by various factors in a person's life and can range widely from individual to individual. For people with RA, quality of life is considered as a combination of several dimensions of health consequences, including pain, fatigue, physical functioning, and social functioning.[3] It is common knowledge that physical activity has many positive benefits on the human body and mind and can therefore improve overall quality of life. There are sadly low physical activity levels among people with RA and there is evidence that shows that there is a need for recommendations on and support of physical activity in this population.[4]

Pharmacological treatment for RA has improved over the years and is aimed at decreasing inflammation as well as slowing down disease progression with the use of disease-modifying anti-rheumatic drugs (DMARDs).[5] Non-pharmacological treatment, specifically exercise, plays an important role in overall healthcare as well. There are different variations of exercise in which someone with RA can participate, such as strength training, aerobic exercise, weight-bearing exercise and hydrotherapy. Because physical activity has many positive effects on quality of life, it would make sense that it would improve quality of life in those with RA as well. Individuals with RA, as well as health-care providers who manage their care, may be hesitant to engage in or recommend exercising because of fear that it may make symptoms and disease progression worse. This fear is understandable, but there is data to support that

implementing physical activity for a duration of four weeks or more may improve quality of life without having detrimental effects on the disease progression in people with RA.

DISCUSSION

Effects of High-Intensity Weight-Bearing Exercise

There is an ample amount of research studies related to the impact that exercise has on people with RA. The results from these studies prove to be useful and enlightening for individuals who suffer from RA and for healthcare providers who treat patients with this condition. Bone and joint destruction and degradation are major complications that occur from RA. A goal of rheumatoid arthritis management is to not only slow disease progression but also refrain from worsening the disease and the associated symptoms. Data collected from a two-year randomized control study revealed that participants who engaged in a long-term high intensity weight-bearing exercise program did not have an increase in the rate of radiological joint damage in the hands and feet. Participants in the exercise group engaged in physical activities including aerobic and impact-generating exercises, while those in the usual care group participated in physical therapy. The physical therapy utilized in the usual care group included hydrotherapy and different types of physical therapy such as active, passive, and therapy with the use of applications. Not only did the results from this study prove that weight-bearing exercise is beneficial in people with RA, they also demonstrated that these types of exercises have a protective effect, particularly in the joints of the feet.[6] The pathophysiological mechanism of these protective effects is not entirely certain and warrants further research investigation. Although the mechanism of these protective effects isn't completely clear, the results from this study indicate that people with RA can participate in weight-bearing exercises without worrying

if more damage will occur to their bones and joints. Even though this is good news, one must keep in mind the extent of preexisting joint damage prior to initiating this type of exercise.

Another study done looking at the effects of high intensity weight-bearing exercise in people with RA showed that in those with preexisting extensive joint damage, this form of exercise appears to accelerate large joint damage progression.[7] The research suggests that patients with extensive joint damage should engage in exercise that is non-weight bearing such as water exercise. The results from these studies show that aside from those with extensive joint damage, people with RA can engage in high intensity weight-bearing physical activity while not further damaging joints and potentially obtain protective effects. Knowing this, people with RA may be more likely to participate in exercise and be able to reap the benefits that exercise provides, therefore enhancing their quality of life.

Effects of Hydrotherapy

Hydrotherapy is a type of physical activity that combines exercise with warm water. This modality of exercise has been used in research studies in people with RA to observe the effects it has on their quality of life. In their research, they compared the outcomes of groups of people with RA who participated in either weekly 30-minute hydrotherapy exercises or land exercises for six weeks. Results from this study revealed that people in the hydrotherapy exercise group were more likely to feel much better or very much better after completing the 30-minute session compared to that of the land exercise group.[8] This study, however, did not show significant differences in quality of life measures or pain scores between the two groups.

Although the results didn't prove any changes regarding quality of life measures between the groups, there is still value in the fact that the hydrotherapy group reported feeling much better after their exercise session. A study by Hall et al. also supported the finding that

hydrotherapy is beneficial for people with RA. The results revealed that there is pain relief due to enhanced blood flow via the warmth of the water encouraging closure of the entryway in the spinal cord.[9] They also found that the hydrostatic pressure of the water immersion helps to reduce edema and that after following up with the participants, mood and tension were significantly improved following hydrotherapy.[9] The results provided by these two studies show that people with RA have the opportunity of participating in hydrotherapy exercise and can receive immediate benefits after completing it. Weight bearing exercise may not sound appealing to everyone, so having an option of water exercise may entice individuals with RA to participate in this exercise modality rather than not do any physical activity at all.

Effects of Aerobic Exercise

In addition to high intensity weight-bearing exercise and hydrotherapy, cardiorespiratory aerobic exercise provides benefits to people with RA as well. A systematic review and meta-analysis showed that cardiorespiratory aerobic exercises (exercise that improves VO2 and that are usually performed at 50–80% of the maximal heart rate) improve some of the most important RA patient outcomes: function, quality of life, and pain.[10] It appears that this type of exercise decreases radiologic damage and pain in those with rheumatoid arthritis.[10] The statistical significance of these findings was small (SMD <0.5), but nevertheless this information still holds value. Even a small impact may encourage someone with RA to take part in cardiorespiratory exercise if it means that their quality of life, function and pain may improve.

Effects of Strength Training Exercise

Strength training is another type of exercise that people with RA may be hesitant to participate in for fear of increased disease progression and pain. Häkkinen et al. conducted a study that researched the effects of strength training in people with RA. Their findings revealed

that a 24-month dynamic strength-training program increased muscle strength and physical function.[11] Although this article didn't directly touch on the subject of quality of life, it is easily inferred that an increase in physical function and activity would help to improve one's quality of life.

An interesting side note gathered from this study showed that although strength training improved muscle strength and physical function in people with RA, it did not have a major effect on bone mineral density (BMD). Decreased BMD can lead to osteoporosis, which is a well-known extraarticular complication of RA.[11] This finding can be indirectly linked to quality of life because decreased BMD leading to osteoporosis can lead to increased risk of fractures, further debilitating people with RA and therefore decreasing their quality of life. Researchers from this study suggest that in order to improve long term outcomes, including BMD, people with RA need to be evaluated early in their disease state and have a personalized exercise program created for them.[11]

Effects of Exercise on Depression

Quality of life can be significantly decreased in someone who has depression. According to a study done on the effects of exercise on depression in people with arthritis and other rheumatic conditions, including rheumatoid arthritis, a common mental health problem is depression.[12] The systematic review with meta-analysis demonstrated that engaging in exercise (aerobic, strength training, or both) for four or more weeks had reductions in depressive symptoms as well as improvements in pain, physical function, and quality of life.[12] This study had its limitations, such as small sample sizes and a lack of adjustments on many analyses due to concern of possibly missing important findings that could be used in future randomized control trials. Nevertheless, this study still provides useful information for people with RA and for

healthcare providers. Depression can have an unfavorable influence on the quality of life in someone with RA. Fortunately the results of this study support the statement that exercise can help to improve depressive symptoms and quality of life.

CONCLUSION

Rheumatoid arthritis can have a profound effect on someone and strongly decrease their quality of life. Pharmacological treatment with DMARDs is a mainstay of treatment for this disease, but it is important to consider non-pharmacological treatment as well. Physical activity is an important lifestyle routine that has a positive impact on health and overall quality of life. Physical inability, decreased functioning, pain, depression and fatigue may be things that contribute to decreased quality of life in someone with RA. It's reasonable to say that if physical activity has positive benefits on the general population, it will have positive effects on people with RA as well. Via the data and results from multiple research studies discussed previously, this statement is proven to be accurate.

The information gathered from these research studies is optimistic for those that suffer from RA. Individuals who have RA and are fearful of making their disease worse may often refrain from physical activity. After understanding that some forms of exercise do not speed up disease progression and that some may actually provide protective effects, people with RA may be more apt to start an exercise program. Another promising finding is that people with RA aren't restricted only to one form of exercise in order to see improvements in their quality of life. Hydrotherapy, weight bearing exercise, aerobic exercise and strength training have all been proven to positively influence the quality of life in people with RA in some form or another. Though the impact may be small in some cases, it is safe to say that any improvement in quality of life would be worth it, especially if there is potential for protective effects. That being said, it

is important to keep in mind the pre-existing joint damage that a person has prior to initiating physical activity. High intensity weight-bearing exercises in people with extensive joint damage should refrain from engaging in exercises that load the joints and instead try something such as hydrotherapy which would be non-weight bearing.

Mental health is just as important as physical health to consider when assessing someone's quality of life. Depression is a common mental health problem in people with RA and may contribute to a decreased quality of life. Exercise fortunately has been found to provide positive effects not only on depressive symptoms, but quality of life, pain, and physical function as well. Knowing this information can be of great value to not only people who have RA, but for healthcare providers as well. In managing their patients, providers can be confident in recommending exercise and reassure them that there will not be detrimental effects on their condition. Rather, they can counsel them on the potential protective effects of some exercises as well as the improvement in quality of life that they would likely benefit from. Based on the data from the studies discussed, an exercise program of four weeks or more can offer these positive effects on quality of life. This may be a reasonable starting point for providers to recommend as a duration of exercise until patients with RA may start to see improvements in their quality of life. It would be interesting to see further research done in areas including the pathophysiological mechanism behind some of the protective effects of exercise on people with rheumatoid arthritis as well as an additional, well-designed randomized control study looking at the effects of exercise on depressive symptoms in those with rheumatoid arthritis.

REFERENCE LIST

1. Rupp I, Boshuizen H, Jacobi C, Dinant H, van den Bos G. Impact of fatigue on health-related quality of life in rheumatoid arthritis. Arthritis Care Res 2004; 51(4): 578-585. doi: 10.1002/art.20539

2. "Quality of life: Meaning of Quality of Life by Lexico." *Lexico Dictionaries.* Lexico Dictionaries, https://www.lexico.com/definition/quality_of_life.

3. Malm K, Bremander A, Arvidsson B, Andersson M, Bergman S, Larsson I. The influence of lifestyle habits on quality of life in patients with established rheumatoid arthritis—A constant balancing between ideality and reality. Int J Qual Stud Health Well-being 2016; 11:1-9. doi: 10.3402/qhw.v11.30534

4. Eurenius E, Stenström C, The Para Study Group. Physical activity, physical fitness, and general health perception among individuals with rheumatoid arthritis. Arthritis Care Res 2005; 53(1), 48-55. doi: 10.1002/art.20924

5. "DMARDs Overview." *www.arthritis.org.*https://www.arthritis.org/living-with-arthritis/treatments/medication/drug-types/disease-modifying-drugs/drug-guide-dmards.php.

6. de Jong Z, Munneke M, Zwinderman A, et al. Long-term high intensity exercise and damage of small joints in rheumatoid arthritis. Ann Rheum Dis 2004; 63:1399–1405. doi: 10.1136 /ard.2003.015826

7. Munneke M, de Jong Z, Zwinderman A, et al. Effect of a high-intensity weight-bearing exercise program on radiologic damage progression of the large joints in subgroups of patients with rheumatoid arthritis. Arthritis Care Res 2005; 53(3): 410-417. doi 10.1002/art.21165

8. Eversden L, Maggs F, Nightingale P, Jobanputra P. A pragmatic randomised controlled trial of hydrotherapy and land exercises on overall well being and quality of life in rheumatoid arthritis. BMC Musculoskelet Disord 2007; 8(23): 1-7. doi:10.1186/1471-2474-8-23

9. Hall J, Skevington S, PhD, Maddison P, Chapman K. A randomized and controlled trial of hydrotherapy in rheumatoid arthritis. Arthritis Rheum 1996; 9(3): 206-215. doi: 10.1002/1529-0131

10. Baillet A, Zeboulon N, Gossec L et al. Efficacy of cardiorespiratory aerobic exercise in rheumatoid arthritis: Meta-analysis of randomized controlled trials. Arthritis Care Res 2010; 62(7): 984-992. doi: 10.1002/acr.20146

11. Häkkinen A, Sokka T, Kotaniemi A, Hannonen P. A randomized two-year study of the effects of dynamic strength training on muscle strength, disease activity, functional capacity,

and bone mineral density in early rheumatoid arthritis. Arthritis Rheumatol 2001; 44(3): 515-522. doi: 10.1002/1529-0131

12. Kelley G, Kelley K, Hootman J. Effects of exercise on depression in adults with arthritis: a systematic review with meta-analysis of randomized controlled trials. Arthritis Res Ther 2015; 17(1): 1-22. doi: 10.1186/s13075-015-0533-5