Spor Hekimliği Dergisi, 56(1):48-50; 2021
Turkish Journal of Sports Medicine
Turk J Sports Med. DOI: 10.47447/tjsm.0482

Case Report / Olgu Sunumu

Effects of exercise on life quality in a rheumatoid arthritis patient

Bir romatoid artrit hastasında egzersizin yaşam kalitesi üzerine etkileri

Diego Alexandre Alonso-Aubin[1], Iván Chulvi-Medrano[2], Moisés Picón-Martinez[3], George S Metsios[4]

[1]*Wingsport, Science and Academy, Torrejon De Ardoz, Spain*
[2]*Department of Physical Activity and Sports, University of Valencia, Valencia, Spain*
[3]*Department of General and Specific Didactics, University of Alicante, Alicante, Spain*
[4]*Faculty of Health Education and Wellbeing, University of Wolverhampton, Wolverhampton, United Kingdom*

ABSTRACT

Rheumatoid arthritis (RA) is a chronic-degenerative disease characterized by symptoms that significantly impact on the functional capacity and thus, the ability to carry out daily functional activities reducing the quality of life (QoL). The aim was to evaluate the effects of a strength and conditioning (S&C) program on the quality of life (QoL), the self-perception disease impact, the self-fatigue perception and cardiovascular risk factors in a patient with rheumatoid arthritis (RA) and cardiovascular disease (CVD).

34-year-old woman (height: 1.40m; weight: 36.1kg) diagnosed with RA and CVD underwent a six-month S&C program with aerobic training 2-3 times a week in 1-3 sets of 5-15 minutes at a moderate to vigorous intensity on a treadmill and/or outdoors and resistance training performed 2-3 times a week in different days from aerobic training, in 1-3 sets of 10-15 repetitions at 5-8 RPE intensity following Borg Scale.

Positive improvement in the total QoL score (52,71 points vs 62,50 points), self-perception disease impact (1,73 points vs 3,72 points), self-fatigue perception with 24,4% for waking up (45 to 56 points) and 51,8% after training session (28 to 54 points) and CVD risk factors; cholesterol (pre:324; inter:215; post:228mg/dl), triglycerides (pre:98; inter:77; post:70 mg/dl), LDL (pre:239; inter:132; post:141 mg/dl), HDL (pre:64.7; inter:67.9; post:72.2 mg/dl) and glucose (pre:99; inter:72; post:72 mg/dl). A S&C program could be a useful tool for the QoL improvement in RA patients.

Keywords: *Exercise, cardiovascular risk factors; osteoarthritis, resistance training*

ÖZ

Romatoid artrit (RA), fonksiyonel kapasiteyi ve dolayısıyla yaşam kalitesini (QoL) düşüren günlük fonksiyonel aktiviteleri gerçekleştirme becerisini önemli ölçüde etkileyen semptomlarla karakterize kronik-dejeneratif bir hastalıktır. Bu olgu sunumunun amacı romatoid artrit (RA) ile birlikte kardiyovasküler hastalığı (KVH) da olan bir hastada kuvvet ve kondisyon (K&K) programının yaşam kalitesi (QoL), algılanan hastalık etkisi, yorgunluk algısı ve kardiyovasküler risk faktörleri açısından etkilerini değerlendirmekti.

RA ve KVH tanısı konulan 34 yaşındaki kadın hasta (boy: 1.40m; ağırlık: 36.1kg) haftada 2-3 kez 1-3 set 5-15 dakikalık aerobik antrenmanla birlikte altı aylık bir kuvvet ve kondisyon (K&K) programına tabi tutuldu. Koşu bandında ve/veya açık havada orta ila şiddetli yoğunluktaki aerobik egzersize ek olarak Borg Ölçeği'ne göre 5-8 RPE yoğunluğunda 1-3 set 10-15 tekrarlı direnç egzersizleri aerobik eğitimden farklı günlerde olmak üzere, haftada 2-3 kez gerçekleştirildi.

Toplam QoL skorunda (52,71 puana karşılık 62,50 puan) olumlu iyileşme, hastalığı algılama etkisinde (1,73 puan ve 3,72 puan) ve yorgunluk algısında sabah uyandığında %24,4 (45 ve 56 puan), eğitimden sonra ise %51,8 (28 ve 54 puan) iyileşme, KVH risk faktörleri açısından; kan kolesterol (ilk: 324; ara: 215; son: 228 mg / dl), trigliserid (ilk:98; ara:77; son:70 mg/dl), LDL (ilk:239; ara:132; son:141 mg/dl), HDL (ilk:64.7; ara:67.9; son:72.2 mg/dl) ve glikoz (ilk:99; ara:72; son:72 mg/dl) değerlerinde olumlu iyileşmeler görüldü. K&K programı, RA hastalarında yaşam kalitesini iyileştirmek için yararlı bir araç olabilir.

Anahtar Sözcükler: *Egzersiz, kardiyovasküler risk faktörleri, osteoartrit, direnç egzersizi*

INTRODUCTION

Rheumatoid arthritis (RA) is a chronic-degenerative disease characterized by symptoms that significantly impact on the functional capacity (1) and thus, the ability to carry out daily functional activities reducing the quality of life (QoL) (2). RA is also accompanied by systemic manifestations, with one the most important being cardiovascular disease (CVD) (3,4). Collective evidence reveals that exercise can ameliorate – at the same time – both RA and CVD related manifestations (5). However, no reports exist to date with regards to the effects of exercise on RA patients that also have CVD.

Therefore, the first aim of this study was to evaluate the effects of a strength and conditioning program (S&C) on the QoL, an important patient-centered clinical outcome. The secondary objectives were to evaluate the effects of the

Received / Geliş: 31.07.2020 · **Accepted / Kabul:** 22.08.2020 · **Published / Yayın Tarihi:** 10.11.2020

Correspondence / Yazışma: Iván Chulvi Medrano · Department of Physical Activity and Sports, University of Valencia, Valencia, Spain · ivan.chulvi@uv.es

Cite this article as: Alonso-Aubin DA, Chulvi-Medrano I, Picón-Martínez M, Metsios GS. Effects of exercise on life quality in a rheumatoid arthritis patient. *Turk J Sports Med.* 2021;56(1).48-50.; http://dx.doi.org/10.47447/tjsm.0482

© 2020 Turkish Sports Medicine Association. All rights reserved.

same program on self-perception disease impact, self-fatigue perception and cardiovascular (CVD) risk factors.

CASE REPORT

Our participant was a 34-year-old woman (height: 1.40m; weight: 36.1kg) diagnosed with RA at the age of 9, who also had tricuspid valve repair due to preserved heart failure (i.e. ejection fraction of 48%) with a stage C according the American Heart Association guidelines (6) and an important self-reported functional disability due to the RA development. The patient was diagnosed by her cardiologist with a level III-moderate cardiac functional capacity following the New York Heart Association guidelines (NYHA) (7), characterized by a marked limitation in activity due to symptoms of fatigue and dyspnea, even during less-than-ordinary activity but comfortable at rest in the previous six months before training intervention.

The patient was informed about the purpose of the study, experimental procedures and potential risk of the study. After being informed she signed the informed consent form.

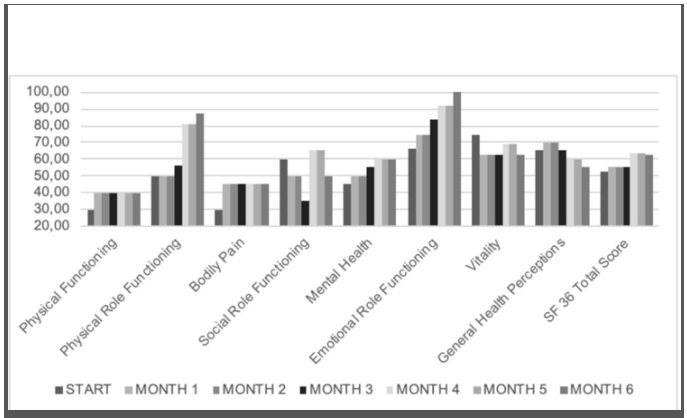
The patient underwent a six-month S&C program, which combined aerobic and resistance training. Aerobic training was performed 2-3 times a week in 1-3 sets of 5-15 minutes at a moderate to vigorous intensity [4-8 rating of perceived exertion (RPE) based on a 0-10 Borg Scale (8)] on a treadmill and/or outdoors. Resistance training was performed 2-3 times a week in different days from aerobic training, in 1-3 sets of 10-15 repetitions at 5-8 RPE intensity. First day was lower-body, second day upper-body and third day whole body exercises. All the training sessions were supervised by a Certified Strength and Conditioning Specialist (CSCS) with more than 7 years of experience with special populations.

QoL: We used the Health Survey Manual (SF-36v2, Standard, Spanish Version 2.0) as well as the Rheumatoid Arthritis Impact of Disease (RAID) questionnaire (9). The latter was used to evaluate the patient's self-perception about the impact of RA on his/her health. QoL and self-perception disease impact were evaluated baseline and every single month, including the end of the intervention on the sixth month.

Fatigue: RPE control, developed by us to monitor fatigue in an easier way for the patient, was filled in daily where the patient had to categorize her level of fatigue from 0 to 5 (0: total rest, 1: light tiredness, 2: medium tiredness; 3: high tiredness, 4: very high tiredness, 5: extreme tiredness) at 10 minutes of waking-up in the morning and 30 minutes after the training session in order to evaluate her fatigue perception.

CVD risk factors: Three blood samples were collected at the baseline, third and sixth month to evaluate changes in CVD risk factors and specifically, cholesterol, triglycerides, low- and high- density lipoproteins (LDL and HDL), and glucose.

Our results revealed a positive improvement in the total QoL score from the baseline (52.71 points) to the end of the S&C program (62.50 points). No improvement were seen, however, in social role functioning, vitality and general health perceptions (Graphic 1).



Graphic 1. SF-36 survey results through six months

Results from the RAID questionnaire demonstrated a positive change in the self-perception with a 47% general improvement (1.73 points) vs. baseline (3.72 points). In addition, we observed positive changes in all RAID categories, except coping.

Results on fatigue showed an improvement in self-fatigue perception less fatigue between the first and sixth month: 24,4% for waking up (45 to 56 points) and 51,8% after training session (28 to 54 points).

CVD risk factors improved throughout the training program: cholesterol (pre:324; inter:215; post:228mg/dl), triglycerides (pre:98; inter:77; post:70 mg/dl), LDL (pre:239; inter:132; post:141 mg/dl), HDL (pre:64.7; inter:67.9; post:72.2 mg/dl) and glucose (pre:99; inter:72; post:72 mg/dl).

DISCUSSION

RA is associated with a decrease in QoL and an increase in the incidence of comorbidities, such as CVD. We have shown for the first time that an individualized S&C program resulted in better QoL and health self-perception as well as a reduction in well-established CVD risk factors in a patient that had both RA and CVD (heart failure).

Our results are in line with collective evidence from systematic reviews and meta-analyses on exercise and RA (10), clearly demonstrating a simultaneous beneficial effect of exercise in different outcomes. Our case study adds to the body of the literature as it is the first study that investigated

the effects of an S&C program on a patient that had both RA and heart failure, with beneficial effects.

We have not found improvements in social role functioning, vitality and general health perceptions. That can be attributed to the fact that in the third month of the program, the patient rejoined her work life.

Training intervention improved the NYHA from group III to group II, characterized by mild symptoms and slight limitation during ordinary activity and this could be associated to the reported improvement in quality of life in the patient.

Fatigue remains a major symptom in RA patients and a barrier for engaging with exercise. However, engagement in exercise significantly reduces fatigue in RA (11). Easily measurable outcomes, such as RPE, can be used by patients to self-monitor their fatigue levels when exercising. Improvements in self-reported scores may provide positive behavioral responses to engaging with exercise. In our study, we observed increases in self-fatigue perception, however, the patient did not withdraw from the training program. This could be attributed to the exercise variability of the training program which combines aerobic and resistance training and her self-motivation as she felt a better QoL.

The positive effect of exercise on heart failure has been reported widely (12). The novelty of our results is that a personalized/individualized concurrent training (e.g. resistance training and aerobic exercise) let improve individual perceptions about RA symptoms and fatigue and the comorbidity related to heart failure (CVD risk factors).

Conflict of Interest / Çıkar Çatışması

The authors declared no conflicts of interest with respect to authorship and/or publication of the article.

Financial Disclosure / Finansal Destek

The authors received no financial support for the research and/or publication of this article.

REFERENCES

1. Singh JA, Saag KG, Bridges Jr SL, Akl EA, Bannuru RR, Sullivan MC, et al. 2015 American College of Rheumatology guideline for the treatment of rheumatoid arthritis. *Arthritis Rheumatol.* 2016;68(1):1–26.
2. Kojima T, Ishikawa H, Tanaka S, Haga N, Nishida K, Yukioka M, et al. Characteristics of functional impairment in patients with long-standing rheumatoid arthritis based on range of motion of joints: Baseline data from a multicenter prospective observational cohort study to evaluate the effectiveness of joint surgery in the. *Mod Rheumatol.* 2018;28(3):474–81.
3. Metsios GS, Stavropoulos-Kalinoglou A, Panoulas VF, Wilson M, Nevill AM, Koutedakis Y, et al. Association of physical inactivity with increased cardiovascular risk in patients with rheumatoid arthritis. *Eur J Cardiovasc Prev Rehabil.* 2009;16(2):188–94.
4. Metsios GS, Stavropoulos-Kalinoglou A, Kitas GD. The role of exercise in the management of rheumatoid arthritis. *Expert Rev Clin Immunol.* 2015;11(10):1121–30.
5. Philbin EF, Ries MD, Groff GD, Sheesley KA, French TS, Pearson TA. Osteoarthritis as a determinant of an adverse coronary heart disease risk profile. *J Cardiovasc Risk.* 1996;3(6):529–33.
6. Yancy CW, Jessup M, Bozkurt B, Butler J, Casey DE, Drazner MH, et al. 2013 ACCF/AHA guideline for the management of heart failure: A report of the American College of Cardiology foundation/American Heart Association task force on practice guidelines. *Circulation.* 2013;128(16):e240–327.
7. Fleg JL, Pina IL, Balady GJ, Chaitman BR, Flether B, Lavie C, et al. Assessment of functional capacity in clinical and research applications: An advisory from the Committee on Exerise, Rehabilitation, and Prevention, Council on Clinical Cardiology, American Heart Association. *Circulation.* 2000;102(13):1591–7.
8. Borg G. Psychophysical scaling with applications in physical work and the perception of exertion. S*cand J Work Environ Health.* 1990;16(Suppl-1):55–8.
9. Gossec L, Dougados M, Rincheval N, Balanescu A, Boumpas DT, Canadelo S, et al. Elaboration of the Preliminary Rheumatoid Arthritis Impact of Disease (RAID) score: A EULAR initiative. *Ann Rheum Dis.* 2009;68(11):1680–5.
10. Hurkmans E, van der Giesen FJ, Vlieland TPMV, Schoones J, Van den Ende ECHM. Dynamic exercise programs (aerobic capacity and/or muscle strength training) in patients with rheumatoid arthritis. *Cochrane Database Syst Rev.* 2009;(4):CD006853
11. Rongen-van Dartel SAA, Repping-Wuts H, Flendrie M, Bleijenberg G, Metsios GS, van Den Hout WB, et al. Effect of aerobic exercise training on fatigue in rheumatoid arthritis: A meta-analysis. *Arthritis Care Res.* 2015;67(8):1054-62.
12. Piña IL, Apstein CS, Balady GJ, Belardinelli R, Chaitman BR, Duscha BD, et al. Exercise and heart failure: A statement from the American Heart Association Committee on exercise, rehabilitation, and prevention. *Circulation.* 2003;107(8):1210–25.