



The Effect of Brisk Walking Exercise on Changes in ESR Levels and CRP in Old Women with Symptoms of Rheumatoid Arthritis

Original Article

Muhammad Saiful Anam^{1*}

¹Department of Sports
Science, Faculty of Sports
Science, Universitas Negeri
Semarang

Correspondence:

Muhammad Saiful Anam,
Gedung F1 Lantai 1, IKOR FIK
UNNES, Kampus Sekaran,
Gunungpati, Kota Semarang,
Indonesia, 50229
Phone: +62 858-7590-0657
E-mail:
anaamanam@gmail.com

Submitted : 09-Feb-2023

Revised : 16-Mar-2023

Accepted : 31-May-2023

Abstract

Examination of the sedimentation rate (ESR) and C-reactive protein (CRP) is recommended as an initial examination in patients suspected of having symptoms of rheumatoid arthritis. Brisk walking is a form of moderate activity aerobic exercise using fast walking techniques for 20-30 minutes with an average speed of 4-6 km/hour. This training model is effective enough to increase the maximum capacity of the heart rate, stimulate muscle contraction, breakdown of glycogen and increase tissue oxygen. The method in this study was a quasi-experimental design with a pre-test – post-test group design without a control group. The sample in this research is 10 respondents. The data collection used was in the form of pre-test and post-test data using data analysis techniques using the independent sample t test and processed using the SPSS application version 20. The results showed 1) There was a significant effect between giving brisk walking exercise to ESR levels (mm/h) in elderly women with rheumatoid arthritis symptoms from the t-test results that the value of $P < 0.05$. 2) There is a significant effect between giving brisk walking exercises on CRP (mg/L) levels in elderly women with rheumatoid arthritis symptoms, this can be seen from the results of the t-test that the value of $P < 0.05$. 3) There is a significant effect between giving brisk walking exercise to ESR levels (mm/h) and CRP levels in elderly women with rheumatoid arthritis symptoms, this can be seen from the results of the t-test that both $P < 0.05$.

Keywords: *brisk walking, ESR, CRP, rheumatoid arthritis*

© 2023 Universitas Negeri Semarang

INTRODUCTION

Rheumatoid Arthritis also occurs in Indonesia which shows a high prevalence. This is proven based on the 2018 Basic Health Research (RIKESEDAS) data, that the proportion of elderly aged 60 years and over with a disease suffering from Rheumatoid Arthritis is 67.4% independent elderly, 28.4% mildly dependent elderly, 1.5% dependent elderly moderate, 1.1% of the elderly are heavily dependent, and 1.5% of the elderly are totally dependent [1]. Meanwhile, the prevalence of joint pain in Indonesia reaches 23.6% to 31.2%. Sufferers of joint pain around the world have reached 355 million people, meaning that 1 out of 6 people in this world suffers from joint pain. It is estimated that this figure will continue to increase until 2025 with indications that 25% will experience paralysis [2].

Rheumatoid Arthritis patients who were examined with quantitative CRP had CRP levels > 5mg/L, as much as 100% and the most common Erythroblastic Rate was found to be > 20

mm/hour, 95.7%, followed by ≤ 20 mm/hour as much as 4.3% [3]. In addition, Rheumatoid Arthritis patients who have abnormal ESR and CRP, one effort to stabilize this is by doing physical exercises such as Brisk Walking Exercise, where physical exercise can neutralize the formation of free radicals that occur due to physical stress so that it can boost the immune system. and affect the number of lymphocytes and monocytes after exercise. Physical exercise prevents inflammatory signalling pathways and stimulates intracellular signals that act on metabolism, oxidatively on the mitochondrial respiration chain, which can enhance the immune system resulting in an increase in lymphocytes [4].

Anti-CCP (Cyclic Citrullinated Peptides), X-Ray, Antinuclear Antibody Test (ANA), Ultrasound (Ultrasonography) and RF (Rheumatoid Factory). Physical exercise prevents inflammatory signalling pathways and stimulates intracellular signals that act on metabolism, oxidatively on the mitochondrial respiration chain, which can enhance the immune system resulting in an increase in lymphocytes [4].

MATERIAL AND METHODS

Based on the problems that have been formulated previously, this study aims to 1) determine the effect of Brisk Walking exercise on changes in ESR levels (mm/h) in elderly women with symptoms of Rheumatoid arthritis. 2) to determine the effect of Brisk Walking exercise on changes in CRP (mg/l) in elderly women with symptoms of Rheumatoid arthritis. 3) knowing the Brisk Walking exercise on changes in ESR levels (mm/h) and CRP (mg/l) in old women with symptoms of Rheumatoid arthritis. The research design uses a quantitative method that uses quasi-experimental designs with a pre-test – post-test group design without a control group which has only one group, namely the experimental group, so that this study does not require a control group [5].

This study using instruments consisting of, 1) Brisk walking exercise tools: -SOP brisk walking exercise and stretching active which contains procedures for carrying out brisk walking exercise. -Stopwatch is used to calculate the duration of training. 2) Instruments, materials, and reagents for examination of the Blood Sedimentation Rate (LED/ESR) and C-Reactive Protein (CRP) Levels.

RESULTS

Table 1. Differences in ESR (mm/h) and CRP (mg/L) levels in old women with pre-test and post-test symptoms of rheumatoid arthritis

Componen	Pre Test		Pos Test		P Value
	Mean	St Deviasi	Mean	St Deviasi	
LED	6643,40	3218,04	6512,50	5072,38	0,007
CRP	4532,50	3096,60	3731,20	4365,17	0,006

Based on Table 1, it shows that the distance between the LED/ESR and CRP has a second price $p < 0.05$, which means that there is a significant difference before and after being given the brisk walking exercise treatment.

DISCUSSION

Examination results of erythrocyte sedimentation rate (ESR) in elderly women with symptoms of Rheumatoid Arthritis. In the LED/ESR before giving the brisk walking exercise with a measurement of 1 hour, the average sedimentation rate was 10.37 mm/hour. Whereas after giving the brisk walking exercise, the average sedimentation rate for 1 hour measurement was

11.90 mm/hour with a minimum value of 1.00 mm/hour and 38.00 mm/hour. When compared to before giving the exercise, there was an increase in the sedimentation rate of 10 people (56.25%). The rapid settling rate indicates increased levels of acute phase immunoglobulin, which causes the erythrocytes to adhere to one another. An increase in ESR is a non-specific marker of inflammation or infection. The average sedimentation rate (2 hours measurement) before giving brisk walking exercise was 22.50 mm/hour with a minimum value of 3.00 mm/hour and 60 mm/hour. While in the 2-hour measurement, the average sedimentation rate of the respondents was 23.09 mm/hour with a minimum value of 2 mm/hour and a maximum of 66 mm/hour. At the 2-hour sedimentation rate, there was a decrease in the ESR value by 10 people (40.625%).

That there was a significant difference before and after being given the brisk walking exercise treatment. The level of c-reactive protein before Brisk Walking was mostly ≥ 200 mg/d. According to the researchers, most women who are respondents, most of their work, are housewives who have many activities but can cause stress due to monotonous work. This is in accordance with the opinion that monotonous work will affect a diet that is higher in carbohydrates which results in Rheumatoid Arthritis.

Based on the inflammatory marker parameters, the analysis found that the median CRP was the same for the post-test and pretest groups, the median ESR was significantly higher in the post-test group and the median procalcitonin levels were significantly higher in the pretest group. The LED/ESR examination is used as a non-specific marker of the course of the disease, especially to examine acute inflammatory processes [6]. Basically, an increase in the ESR value can occur in other infectious diseases, thus the ESR value is not used as a diagnostic enforcer but is used as a diagnostic support. But despite the barriers and the recognition of more specific markers, the ESR examination is a hematological examination performed in various hospitals as a distinctive screening test worldwide for acute phase protein and chronic disease.

CONCLUSION

There is a significant effect between giving brisk walking exercises on ESR levels (mm/h) and CRP levels in elderly women with rheumatoid arthritis symptoms, this can be seen from the results. Thus, we conclude that there is a difference significant before and after being given the brisk walking exercise treatment.

ACKNOWLEDGMENT

The best gratitude is addressed to all respondents from Alasdowo Village, Dukuhseti District, Pati Regency, Central Java, Indonesia.

CONFLICTS OF INTEREST

Conflict of interest : Authors state no conflict of interest.

Disclosure statement : No author has any financial interest or received any financial benefit from this research.

REFERENCES

1. RISKESDAS. (2018). Hasil Utama Riset Kesehatan Dasar (RISKESDAS) (Vol. 44, Salemba Medika.
2. Meytania Utami, dkk. (2015). Faktor-Faktor Arthritis Rheumatoid Pada Masyarakat di Wilayah Kerja Puskesmas Ngemplak Simongan Semarang Barat.

3. Selvarasu, P. S. A. (2016). Hubungan Kadar C-Reaktif Protein (CRP) Dan Laju Endap Darah (LED) Pada Pasien Rheumatoid Arthritis Fase Flare Di Rsup Haji Adam Malik Tahun 2012-2015. [Universitas Sumatera Utara (RI-USU)].
4. Stewart, L. K., Flynn, M. G., Campbell, W. W., Craig, B. A., Robinson, J. P., Timmerman, K. L., & Talbert, E. (2009). The influence of exercise training on inflammatory cytokines and C-reactive protein. *Medicine and Science in Sports and Exercise*, 39(10), 1714.
5. Sugiyono. (2015). *Metode Penelitian Kuantitatif, Kualitatif, dan R&D*. Bandung: Alfabeta, CV.
6. Kasih, K. N., & Sulastina, N. A. (2019). Analisis Laju Endap Darah Pada Pasien Tuberkulosis Paru. *Jurnal 'Aisyiah Medika*, 4(1), 44-52.