

Investigation of recurrence of joint symptoms after COVID-19 in patients with rheumatoid arthritis: Cross-sectional study

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Background: In this study, the relationship between involvement by COVID-19 and the recurrence of symptoms of rheumatoid arthritis (RA) was investigated. **Materials and Methods:** This cross-sectional study was conducted on 112 patients with RA with and without a history of COVID-19. The severity and recurrence of RA symptoms were measured and recorded by the Disease Activity Score in 28 joints (DAS-28) index and clinical evaluations by a rheumatologist. **Results:** The results showed that the recurrence of RA in patients with and without a history of COVID-19 had a statistically significant difference ($P < 0.001$). In addition, there was a statistically significant relationship between erythrocyte sedimentation rate, visual analogue scale (VAS), tender joint count, swollen joint count, and DAS-28 and the history of COVID-19 ($P < 0.05$). **Conclusion:** The present study showed that infection with COVID-19 leads to the recurrence of joint symptoms in RA patients.

Key words: COVID-19, recurrence, rheumatoid arthritis

How to cite this article: Akbarpour A, Salehi M, Babak A. Investigation of recurrence of joint symptoms after COVID-19 in patients with rheumatoid arthritis: Cross-sectional study. *J Res Med Sci* 2024;29:21.

INTRODUCTION

Previous studies have shown that the prognosis of COVID-19 infection is worse in patients with rheumatoid arthritis (RA) than in other patients. Treatment failure, severe pulmonary involvement, and early death are some of the adverse complications of this disease that are more common in RA patients than in the healthy population.^[1]

Not many studies have been conducted on the impact of COVID-19 on the complications of RA. Although the research findings have shown that infection with COVID-19 affects the complications of RA, the results are not reliable due to the low power of these studies; more clearly, the reproducibility and generalizability of these results to all patients with RA are questionable.

MATERIALS AND METHODS

In this cross-sectional study, patients with RA (Based on the American College of Rheumatology and European League Against Rheumatism classification criteria) referred to the rheumatology clinics of Al-Zahra and Khorshid Hospitals with and without a history of COVID-19 (112 patients). Demographic and clinical characteristics and RA recurrence were collected using a checklist and through interviews. The severity of symptoms and symptoms of recurrence were measured using the Disease Activity Score in 28 joints (DAS-28)^[2] and clinical examinations conducted by a rheumatologist. Scores higher than 2.3 were considered as disease recurrence and less than that as disease control. All study procedures were approved by the Ethics Committee of the

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DOI:

10.4103/jrms.jrms_782_22

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Submitted: 09-Nov-2022; **Revised:** 27-Nov-2023; **Accepted:** 11-Dec-2023; **Published:** 29-Apr-2024

Isfahan University of Medical Sciences (IR.MUI.MED. REC.1400.823).

The data were analyzed using the SPSS 22 (IBM Corp., Armonk, NY, USA). The significance level was considered to be 0.05.

RESULTS

Demographic and clinical characteristics, frequency of

joint symptoms, and recurrence of joint symptoms in our participants are shown in Table 1.

The results showed that the disease recurred in (64.3%) 72 of our patients. The results showed that the recurrence of the disease was higher in the patients who had a history of infection with COVID-19 compared to the group that did not, and the difference was statistically significant ($P < 0.001$). In addition, the results of the study showed that there was a statistically significant relationship between erythrocyte

Table 1: Demographic and clinical characteristics, frequency of joint symptoms, and recurrence of joint symptoms in participants

Variable	Infected with COVID-19 (n=58)	Not being infected with COVID-19 (n=54)	P
Age (mean±SD)	13.2±55.6	12.2±58	0.32 ^a
Duration of RA (mean±SD)	7.1±13.24	5.9±13.37	0.92 ^a
Sex			
Male	9 (15.5)	13 (24.1)	0.25 ^b
Female	49 (84.5)	41 (75.9)	
Comorbidities			
Yes	27 (46.6)	18 (33.3)	0.15 ^b
No	31 (53.4)	36 (66.7)	
Swollen joint count			
0	2 (3.4)	0	0.09 ^b
1–6	36 (62.1)	42 (77.8)	
7–10	18 (31)	12 (22.2)	
≥11	2 (3.4)	0	
Tender joint count			
0	7 (12.1)	9 (16.7)	0.79 ^b
1–5	50 (86.2)	44 (81.5)	
≥6	1 (1.7)	1 (1.9)	
Serology (RF)			
Positive	54 (93.1)	46 (85.2)	0.18 ^b
Negative	4 (6.9)	8 (14.8)	
Complications in other organs			
Yes	28 (48.3)	18 (33.3)	0.11 ^b
No	30 (51.7)	36 (66.7)	
CRP			
Positive	49 (84.5)	29 (53.7)	<0.001 ^b
Negative	9 (15.5)	25 (46.3)	
ESR (mean±SD)	21.5±31.48	18.8±17.2	<0.001 ^a
SJC			
0	8 (13.8)	39 (72.2)	<0.001 ^b
1	23 (39.7)	9 (16.7)	
2	18 (31)	4 (7.4)	
3	18 (31.8)	2 (3.7)	
4	1 (1.7)	0	
TJC			
1–4	22 (37.9)	31 (57.4)	0.003 ^b
5–7	27 (46.6)	23 (42.6)	
≥8	9 (15.5)	0	
VAS (visual pain scale) (mean±SD)	18.9±44.22	18.5±15.6	<0.001 ^a
DAS-28 (mean±SD)	0.9±4.5	1.1/±3.1	<0.001 ^a
Recurrence			
Yes	56 (96.6)	16 (29.6)	<0.001 ^b
No	2 (3.4)	38 (70.4)	

^at-test; ^bChi-square test. SD=Standard deviation; RF=Rheumatoid factor; CRP=C-reactive protein; ESR=Erythrocyte sedimentation rate; SJC=Swollen joint count; TJC=Tender joint count

Table 2: Investigation of the relationship between the severity of the disease of COVID-19 and the recurrence of joint symptoms in participants

Variable	Mild (n=51)	Medium (n=5)	severe (n=2)	P ^a
Recurrence				
Yes	49 (96.1)	5 (100)	2 (100)	0.87
No	2 (3.9)	0	0	

^aChi-square test

sedimentation rate (ESR), visual pain scale (VAS), tender joint count (TJC), swollen joint count (SJC), and DAS-28 and the history of COVID-19 ($P < 0.05$).

The results on the severity of COVID-19 in RA patients showed that the severity of the disease had no statistically significant relationship with the recurrence of joint symptoms ($P = 0.87$) [Table 2].

DISCUSSION

Cases of RA recurrence and reactive arthritis following COVID-19 infection have been reported.^[3-5] In agreement with the results of the present study, other studies have also shown an increased risk of RA recurrence following COVID-19 infection.^[6,7] In this study, we found that the DAS-28 scores were higher in RA patients with a history of COVID-19 than in patients without such a history ($P < 0.05$). The level of pain and joint problems and the average ESR increase in COVID-19 patients. The high DAS-28 in RA patients with a history of COVID-19 can be due to an additional burden caused by COVID-19 infection in these patients, which causes an increase in TJC, SJC, VAS, and ESR. However, in this study, the number of swollen joints and ESR, which are objective values, were significantly different between the two groups. As a result, it can be argued that a history of COVID-19 infection can lead to the recurrence and flare of RA in these patients.

CONCLUSION

The results of the present study showed that there was a statistically significant relationship between

contracting COVID-19 and ESR, VAS, TJC, SJC, and DAS-28. Consequently, it can be argued that COVID-19 infection leads to the recurrence of joint symptoms in RA patients.

Acknowledgments

We would like to thank the Research Vice Chancellor of Isfahan University of Medical Sciences, the Director of rheumatology clinics of Al-Zahra and Khorshid Hospitals, the esteemed staff of the clinics for their unwavering support, and the dear patients and their families.

Financial support and sponsorship

This study was conducted as part of the internal assistant dissertation of the first author, supported by the Isfahan University of Medical Sciences, under grant number IR.MUI.MED.REC.1400.823.

Conflicts of interest

There are no conflicts of interest.

REFERENCES

- Huang C, Wang Y, Li X, Ren L, Zhao J, Hu Y, *et al.* Clinical features of patients infected with 2019 novel coronavirus in Wuhan, China. *Lancet* 2020;395:497-506.
- Aletaha D, Ward MM, Machold KP, Nell VP, Stamm T, Smolen JS. Remission and active disease in rheumatoid arthritis: Defining criteria for disease activity states. *Arthritis Rheum* 2005;52:2625-36.
- Saricaoglu EM, Hasanoglu I, Guner R. The first reactive arthritis case associated with COVID-19. *J Med Virol* 2021;93:192-3.
- Ono K, Kishimoto M, Shimasaki T, Uchida H, Kurai D, Deshpande GA, *et al.* Reactive arthritis after COVID-19 infection. *RMD Open* 2020;6:e001350.
- Jali I. Reactive arthritis after COVID-19 infection. *Cureus* 2020;12:e11761.
- Barbhaiya M, Levine JM, Bykerk VP, Jannat-Khah D, Mandl LA. Systemic rheumatic disease flares after SARS-CoV-2 vaccination among rheumatology outpatients in New York city. *Ann Rheum Dis* 2021;80:1352-4.
- Felten R, Scherlinger M, Guffroy A, Poindron V, Meyer A, Giannini M, *et al.* Incidence and predictors of COVID-19 and flares in patients with rare autoimmune diseases: A systematic survey and serological study at a national reference center in France. *Arthritis Res Ther* 2021;23:188.