

ORIGINAL RESEARCH

Prospective Analysis of Prevalence of Acute Myocardial Infarction in Patients with Rheumatoid Arthritis: An Institutional Based Study

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ABSTRACT

Background: An excess burden of cardiovascular disease (CVD) in patients with rheumatoid arthritis (RA) is an established paradigm. The present study was conducted to assess the prevalence of acute myocardial infarction in patients with rheumatoid arthritis.

Materials & Methods: From the outpatient department, 150 patients with a confirmed diagnosis of RA were included in this study. Demographic factors including age, past and family history of MI were noted using a self-structured questionnaire. MI was diagnosed based on symptoms, cardiac enzyme, and ECG. Statistical analysis was done using the Statistical Package for the Social Sciences (SPSS) (IBM Corporation, Armonk, New York, USA). p-value of < 0.05 was considered significant.

Results: In the present study, 150 patients with a confirmed diagnosis of RA were included in which 53.33% were females and 46.66% were males. The mean age of patients was 48 years. 4.66% patients had previous history of MI and 6% patients had family history of MI. 14% RA patients had non-fatal MI and 4% RA patients had fatal MI. In 82% RA patients MI was absent.

Conclusion: The present study concluded that 14% RA patients had non-fatal MI and 4% RA patients had fatal MI.

Keywords: Acute Myocardial Infarction, Rheumatoid Arthritis, ECG.

INTRODUCTION

Rheumatoid arthritis (RA) is an autoimmune chronic inflammatory disease of the synovial membrane of the joints. It affects approximately 0.5% to 1% of the population globally, mostly the elderly, with a predilection towards the female sex. Chronic inflammation leads to joint pain, stiffness, and joint distortion, leading to restricted movement and progressive disability that greatly hampers the quality of life in these individuals.^{1,2} RA also presents with extra-articular manifestations like osteoporosis, pericarditis, vasculitis, and Sjögren's syndrome.³ Several studies have documented a substantial excess mortality in patients with rheumatoid arthritis from AMI and other cardiovascular diseases. It is possible that systemic inflammation in rheumatoid arthritis may lead to an acceleration of atherogenesis.⁴ Cardiovascular (CV) events occur approximately a decade earlier in RA than in the general population⁵, suggesting that RA, similarly to diabetes mellitus, is an independent risk factor

for premature ischemic heart disease.^{6,7} The increased prevalence of atherosclerotic CVD and MI among patients with RA is well documented, but less is known about the outcomes after MI.⁸ The present study was conducted to assess the prevalence of acute myocardial infarction in patients with rheumatoid arthritis.

MATERIALS & METHODS

This prospective study was carried out in the Department of General Medicine, People's College of Medical Sciences & Research Centre, Bhopal, Madhya Pradesh (India) to assess the prevalence of acute myocardial infarction in patients with rheumatoid arthritis. From the outpatient department, 150 patients with a confirmed diagnosis of RA were included in this study. Before the commencement of the study ethical approval was taken from the ethical committee of the institute and informed consent was taken from the patient. Demographic factors including age, past and family history of MI were noted using a self-structured questionnaire. MI was diagnosed based on symptoms, cardiac enzyme, and ECG. Statistical analysis was done using the Statistical Package for the Social Sciences (SPSS) (IBM Corporation, Armonk, New York, USA). p-value of < 0.05 was considered significant.

RESULTS

In the present study, 150 patients with a confirmed diagnosis of RA were included in which 53.33% were females and 46.66% were males. The mean age of patients was 48 years. 4.66% patients had previous history of MI and 6% patients had family history of MI. 14% RA patients had non-fatal MI and 4% RA patients had fatal MI. In 82% RA patients MI was absent.

Table 1: Demographic characteristics

Variables	N(%)
Mean age(yrs)	48.15 ± 14
Gender	
Male (%)	70(46.66%)
Female (%)	80(53.33%)
Previous history of MI	7(4.66%)
Family history of MI	9(6%)

Table 2: Prevalence of acute myocardial infarction in patients with rheumatoid arthritis

Prevalence of acute myocardial infarction	N(%)
Non-fatal MI	21(14%)
Fatal MI	6(4%)
Absent	255(82%)
Total	150(100%)

DISCUSSION

Several mechanisms including individual differences in pain perception and generalized hyposensitivity to myocardial ischemia play an important role in the pathology of RA, and more recently, the balance between proinflammatory and anti-inflammatory cytokines.⁹⁻¹¹ According to the inflammation-based hypothesis, there is an increased production of anti-inflammatory cytokines with decreasing expression of CD11b/CD18 adhesion molecules on phagocytes among patients with asymptomatic ischemia.¹⁰

In the present study, 150 patients with a confirmed diagnosis of RA were included in which 53.33% were females and 46.66% were males. The mean age of patients was 48 years. 4.66% patients had previous history of MI and 6% patients had family history of MI. 14% RA

patients had non-fatal MI and 4% RA patients had fatal MI. In 82% RA patients MI was absent.

Ali A et al did a study to compare the risk of CVD among patients with RA and DM and found that both fatal (12.66% vs. 13.48%; p-value: 0.79) and non-fatal (3.93% vs. 4.35%; p-value: 0.82) MI was comparable between both RA and DM group. However, compared to the control group, non-fatal MI (12.66% vs. 5.58%; p-value: 0.01) was significantly higher in the RA group.¹²

Turesson C et al investigate the first-ever incidence of acute myocardial infarction and stroke in a community-based RA cohort compared with the general population and found that Fifty four patients with RA had first-ever myocardial infarctions or stroke during the study period, compared with 3862 subjects in the general population. The age and sex adjusted SMR was 161 (95% confidence interval (CI) 121 to 210). The first-ever incidence of cardiovascular disease was increased among female and male patients when studied separately. The increase of cardiovascular events in the RA cohort was mainly due to an excess of myocardial infarctions (n=36; SMR=176 (95% CI 123 to 244)).¹³

Mantel and colleague previously studied 1135 Swedish RA patients and 3184 matched controls with first-time acute coronary syndrome (ACS) in 2007–2010. They reported that, among RA patients compared with controls, the risk for recurrent ACS was increased by 25% and risk for all-cause mortality by 50% in a model adjusted for age, sex, pre-existing comorbidities, pharmacotherapies and ACS type.¹⁴

McCoy et al. evaluated the outcomes of acute myocardial infarction in patients with rheumatoid arthritis and found numerically lower rates of short-term mortality between rheumatoid arthritis and non-rheumatoid arthritis (6% versus 12%), which did not reach statistical significance, but 5-year all-cause mortality was higher among rheumatoid arthritis compared with nonrheumatoid arthritis.¹⁵

CONCLUSION

The present study concluded that 14% RA patients had non-fatal MI and 4% RA patients had fatal MI.

REFERENCES

1. Epidemiology and genetics of rheumatoid arthritis. Silman AJ, Pearson JE. *Arthritis Res Ther.* 2002;4:0.
2. Rheumatoid arthritis: pathological mechanisms and modern pharmacologic therapies. Guo Q, Wang Y, Xu D, Nossent J, Pavlos NJ, Xu J. *Bone Res.* 2018;6:15.
3. Extra-articular manifestations in rheumatoid arthritis. Cojocaru M, Cojocaru IM, Silosi I, Vrabie CD, Tanasescu R. <https://pubmed.ncbi.nlm.nih.gov/21977172/> *Maedica (Bucur)* 2010;5:286–291.
4. Sattar N, McCarey DW, Capell H, et al. Explaining how “high-grade” systemic inflammation accelerates vascular risk in rheumatoid arthritis. *Circulation.* 2003; 108: 2957–2963.
5. Bacon PA, Stevens RJ, Carruthers DM, Young SP, Kitas GD: Accelerated atherogenesis in autoimmune rheumatic diseases. *Autoimmun Rev.* 2002, 1: 338-347. 10.1016/S1568-9972(02)00100-3.
6. del Rincon ID, Williams K, Stern MP, Freeman GL, Escalante A: High incidence of cardiovascular events in a rheumatoid arthritis cohort not explained by traditional cardiac risk factors. *Arthritis Rheum.* 2001, 44: 2737-2745. 10.1002/1529-0131(200112)44:12<2737::AID-ART460>3.0.CO;2-#.

7. Solomon DH, Goodson NJ, Katz JN, Weinblatt ME, Avorn J, Setoguchi S, Canning C, Schneeweiss S: Patterns of cardiovascular risk in rheumatoid arthritis. *Ann Rheum Dis*. 2006, 65: 1608-12. [10.1136/ard.2005.050377](https://doi.org/10.1136/ard.2005.050377).
8. Antti Palomäki, Anne M Kerola, Markus Malmberg, Päivi Rautava, Ville Kytö, Patients with rheumatoid arthritis have impaired long-term outcomes after myocardial infarction: a nationwide case-control registry study. *Rheumatology* 2021 Nov; 60(11):5205–15. <https://doi.org/10.1093/rheumatology/keab204>
9. Silent myocardial ischemia. Cohn PF, Fox KM, Daly C. <https://pubmed.ncbi.nlm.nih.gov/12963683/> *Circulation*. 2003;108:1263–77.
10. Increased production of inflammatory cytokines in patients with silent myocardial ischemia. Mazzone A, Cusa C, Mazzucchelli I, et al. <https://core.ac.uk/download/pdf/82406371.pdf>. *J Am Coll Cardiol*. 2001;38:1895–1901.
11. Li J-J. Silent myocardial ischemia may be related to inflammatory response. *Med Hypotheses*. 2004;62:252–6. <https://pubmed.ncbi.nlm.nih.gov/14962636/>
12. Ali A, Ali A, Kumar D, et al. Comparison of Incidence of Myocardial Infarction in Patients With Rheumatoid Arthritis and Diabetes Mellitus. *Cureus*. 2021;13(6):e15716. doi:10.7759/cureus.15716
13. Turesson C, Jarenros A, Jacobsson L. Increased incidence of cardiovascular disease in patients with rheumatoid arthritis: results from a community based study. *Annals of the Rheumatic Diseases* 2004;63:952-5.
14. Mantel Å, Holmqvist M, Jernberg T, Wällberg-Jonsson S, Askling J. Long-term outcomes and secondary prevention after acute coronary events in patients with rheumatoid arthritis. *Ann Rheum Dis* 2017;76:2017–24.
15. McCoy SS, Crowson CS, Maradit-Kremers H, Therneau TM, Roger VL, Matteson EL, et al. Long term outcomes and treatment after myocardial infarction in patients with rheumatoid arthritis. *The Journal of rheumatology*. 2013;40:605-10.