

Risk of Cardiovascular Disease in Rheumatoid Arthritis Patients

A Mohaideen Pitchai¹, P K Jawaharlal²

¹Senior Civil Surgeon, Department of Medicine, Government Head Quarters Hospital, Ramanathapuram, Tamil Nadu, India, ²Chief Civil Surgeon, Department of Medicine, Government Head Quarters Hospital, Ramanathapuram, Tamil Nadu, India

Abstract

Introduction: The chronic systemic autoimmune disease with an uncertain etiology affecting about 1–2% of the general population is inflammatory arthritis, which involves rheumatoid arthritis (RA), ankylosing spondylitis, and psoriatic arthritis. CV risk factors (e.g., hypertension, dyslipidemia, smoking habits, and diabetes) are more common in patients with inflammatory arthritis.

Aim: The aim of the study was to study the risk of cardiovascular diseases in RA patients.

Materials and Methods: This prospective hospital-based study was done to study the risk of cardiovascular diseases in RA patients. A total of 60 patients diagnosed with RA were enrolled in this study. Informed consent was obtained from the study population, and all the demographic data, history, all laboratory investigations were made, and the results were analyzed statistically and discussed.

Results: A total of 60 patients were included in this study in that females were 48 and males were 12. Mean age group was 44.21 years, mean duration of RA was 12.2 ± 4.28 , mean CDAI score among them is 23.08 ± 11.14 . Metacarpophalangeal, proximal interphalangeal joint, and wrist joints are the most commonly involved joints among the study population. Anemia occurs more common in our study population, followed by lymphocytosis, thrombocytopenia, thrombocytosis, dyslipidemia, and hypertriglyceridemia. ESR and CRP are increased in many of the patients in our study population. ECG changes show that 15 patients had left axis deviation, followed by other changes. Echo cardiograph shows that 44% had VSDD, followed by other problems such as LVSD, PF, and so on.

Conclusion: From this study, we concluded that there is a significant relationship between variation in ejection fraction and clinical disease activity index score, and there is a strong correlation between left ventricular systolic dysfunction and clinical disease severity index score.

Key words: Cardiovascular diseases, CRP, ESR, Lymphocytosis, Rheumatoid arthritis

INTRODUCTION

The disorder contributes to the deterioration of the bone and cartilage in multiple joints, most possibly caused by constant inflammatory burden and leads to chronic inflammatory arthritis, including RA and ankylosing spondylitis and arthritis.^[1] This disease destroys cartilage and bone. This disease leads to bone destruction and

cartilage in various joints. In all these diseases, there is also a two- to three-fold rise in CV risk in RA, comparable to people living in diabetes mellitus, as data from the previous decade has accumulated, chronic inflammatory arthritis patients are at greater risk for CV disease as well.^[2,3] The previous studies reported up to twice an increase in CV prevalence over all these diseases in combination.^[4-6]

Inflammatory arthritis patients are more likely to have a high prevalence of CV risk factors (such as hypertension, dyslipidemia, cigarette smoking, and diabetes).^[7] Inflammation has shown to influence specifically microcirculation (which also precedes hypertension),^[8,9] adverse changes to the lipid composition (and thereby causing dyslipidemia)^[10,11] and to deteriorate insulin sensitivity leading to insulin resistance.^[12,13] However, the

Access this article online



www.ijss-sn.com

Month of Submission : 09-2020
Month of Peer Review : 09-2020
Month of Acceptance : 10-2020
Month of Publishing : 11-2020

Corresponding Author: Dr. P K Jawaharlal, Department of Medicine, Government Head Quarters Hospital, Ramanathapuram, Tamil Nadu, India.

risk factors for excessive risk of CV are not clarified in the patient of inflammatory arthritis alone. Moreover, in a patient with inflammatory arthritis, new risk factors for CV may improve the CV disease risk prediction.

Research has shown that from early endothelial dysfunction or lipid deposition to atherosclerotic plaque build-out and its eventual rupture can also affect all stages of the atherosclerotic phase, which eventually leads to

Table 1: Distribution of study parameters

S. No	Study parameters	Mean values
1	Age	44.21 years
2	Duration of RA	12.2±4.28
3	CDAI score	23.08±11.14

Table 2: Risk factors

S. No	Risk factor	No. of patients	Percentage
1	Anemia	40	66
2	Lymphocytosis	10	16
3	Thrombocytosis	3	5
4	Thrombocytopenia	11	18
5	Dyslipidemia	10	16
6	Hyper triglyceridemia	4	6
7	Raised ESR	59	98
8	Raised CRP	34	56

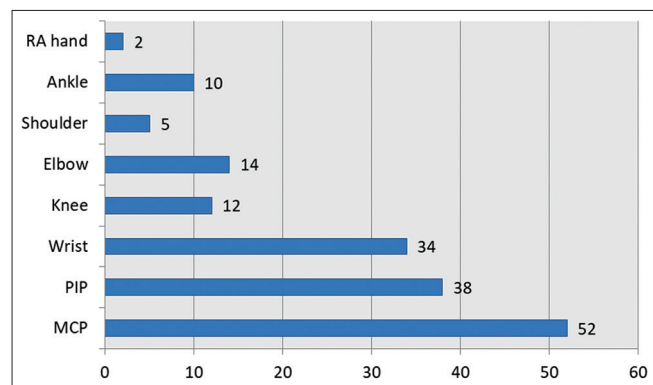


Figure 1: Joint involvement

thrombosis.^[14] However, it is not yet completely understood how the CV disease occurs in chronic inflammatory arthritis.

A significant and potentially useful method for assessing the risk of subclinical CVs is non-invasive imagery of vessel walls. Many non-invasive therapies for vessel alterations linked to early pre-clinical atherosclerosis have been established. Because of the crucial role of inflammation in atherosclerosis production, in particular, for patients with inflammatory arthritis, the effects of anti-inflammatory treatment on the risk of CV in such patients will logically be investigated. The current anti-inflammatory weapons contain several other anti-inflammatory drugs, which have numerous mechanisms for reducing inflammation.^[15] Tumor necrosis factor (TNF-) alpha-blockers are the most recent in the areas of rheumatology, which inhibits TNF-alpha, which is an essential pro-inflammatory cytokine for inflammatory arthritis and atherosclerosis.

Aim

The aim of the study was to study the risk of cardiovascular diseases in rheumatoid arthritis (RA) patients.

MATERIALS AND METHODS

This prospective observational study was conducted in the Department of General Medicine at Ramanathapuram Headquarters hospital from 2019 August to 2019 December. A total of 60 patients diagnosed with RA were enrolled in this study. Informed consent was obtained from the study population, and all the demographic data were obtained from the patients. All the medical history, complete blood examination, total cholesterol level, ESR, CRP values, and other laboratory investigation were obtained from the patients. ECG and echocardiography images were also obtained from the patients. The results were analyzed statistically and discussed.

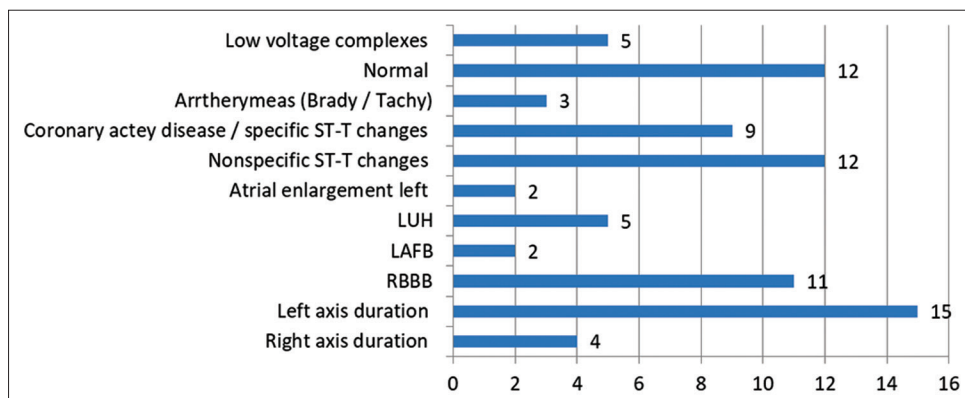


Figure 2: ECG changes in the study group

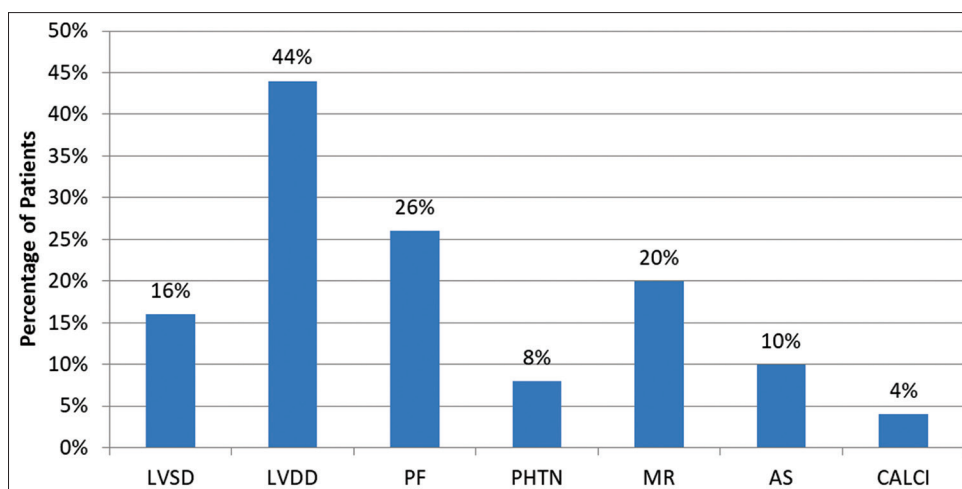


Figure 3: Distribution of echo radiograph

RESULTS

A total of 60 patients were included in this study in that females were 48 and males were 12. Mean age group was 44.21 years, mean duration of RA was 12.2 ± 4.28 , mean CDAI score among them is 23.08 ± 11.14 [Table 1].

Fifty-two patients had RA involved in MCP, 38 patients in PIP, 34 patients in the wrist, 14 patients in the elbow, 12 patients in the knee, ten patients in Ankle, five patients in the shoulder, and two patients in RA hand [Figure 1].

Forty patients had anemia, ten patients had lymphocytosis, three patients had thrombocytosis, 11 patients had thrombocytopenia, ten patients had dyslipidemia, four patients had hyper triglyceridemia, 59 patients had raised ESR, and 34 patients had raised CRP [Table 2].

Fifteen patients had left axis duration, 12 patients had normal ECG, 12 patients had nonspecific ST-T changes, 11 patients had RBBB, nine patients had specific ST-T changes, five patients had low voltage complexes, five patients had LUH, four patients had right axis duration, three patients had arrhythmias, and three patients had LAFB [Figure 2].

Ten patients had LVSD, 26 patients had LVDD, 16 patients had PF, five patients had PHTN, 12 patients had MR, ix patients had AS, and two patients had CALCI [Figure 3].

DISCUSSION

CVD is the world's leading cause of death. The prevalence and incidence of CVD are rising alarmingly on the American continent. It is anticipated by the World Health Organization that the number of CVD-related deaths in the area between the 2 years 2000 and 2020 will rise by more than 60 percent

if preventative steps are not taken.^[16] Persons living in developing countries, for example, inappropriate styles of life, have more risk factors leading to a higher CVD death rate. To avoid CVD, it is, therefore, critical that healthy behaviors be encouraged among the general public and in patients with early diagnoses of RA.

In our study, there is a significant relationship between variation in ejection fraction and clinical disease activity index score ($r= 0.412$, $P=0.001$). There is a strong correlation between left ventricular systolic dysfunction and clinical disease severity index score ($P < 0.0001$).

The amount of lipid level has a paradoxical link to CAD risk in RA, as lower levels of lipid are correlated with more severe systemic inflammation, which, in turn, has a greater risk of CAD.^[17] In RA inflammation seem to also alter the structure and function of lipoproteins^[18] serum amyloid A increased heart disease load in patients with RA is related to increased inflammatory markers, such as CRP, erythrocyte sediment, rheumatoid factor, and anti-citrullinated protein antibodies.^[19] A serum amyloid A increased load borne by HDL, and apolipoprotein A-I decreased, affecting typical anti-atherogenic effects of HDL and inducing a pro-atherogenic action.^[20] Rheumatoid factor and antinuclear antibodies have been associated with heart disease and overall mortality, even in patients without rheumatic diseases.^[21] Cisternas *et al.*^[22] evaluated cardiovascular risk factors in Chilean patients with RA and reported a prevalence of 46.4% for CVD.

CONCLUSION

From this study, we concluded that there is a significant relationship between variation in ejection fraction and clinical disease activity index score, and there is a strong

correlation between left ventricular systolic dysfunction and clinical disease severity index score.

REFERENCES

- Lawrence RC, Helmick CG, Arnett FC, Deyo RA, Felson DT, Giannini EH, *et al.* Estimates of the prevalence of arthritis and selected musculoskeletal disorders in the United States. *Arthritis Rheum* 1998;41:778-99.
- Avina-Zubieta JA, Thomas J, Sadatsafavi M, Lehman AJ, Lacaille D. Risk of incident cardiovascular events in patients with rheumatoid arthritis: A metaanalysis of observational studies. *Ann Rheum Dis* 2012;71:1524-9.
- Peters MJ, van der Horst-Bruinsma I, Dijkmans BA, Nurmohamed MT. Cardiovascular risk profile of patients with spondylarthropathies, particularly ankylosing spondylitis and psoriatic arthritis. *Semin Arthritis Rheum* 2004;34:585-92.
- van Halm VP, Peters MJ, Voskuyl AE, Boers M, Lems WF, Visser M, *et al.* Rheumatoid arthritis versus diabetes as a risk factor for cardiovascular disease: A cross-sectional study, the CARRE investigation. *Ann Rheum Dis* 2009;68:1395-400.
- Solomon DH, Kremer J, Curtis JR, Hochberg MC, Reed G, Tsao P, *et al.* Explaining the cardiovascular risk associated with rheumatoid arthritis: Traditional risk factors versus markers of rheumatoid arthritis severity. *Ann Rheum Dis* 2010;69:1920-5.
- del Rincon ID, Freeman GL, Haas RW, O'Leary DH, Escalante A. Relative contribution of cardiovascular risk factors and rheumatoid arthritis clinical manifestations to atherosclerosis. *Arthritis Rheum* 2005;52:3413-23.
- 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;44:2737-45.
- Serne EH, Stehouwer CD, ter Maaten JC, ter Wee PM, Rauwerda JA, Donker AJ, *et al.* Microvascular function relates to insulin sensitivity and blood pressure in normal subjects. *Circulation* 1999;99:896-902.
- Serne EH, de Jongh RT, Eringa EC, Ijzerman RG, de Boer MP, Stehouwer CD. Microvascular dysfunction: Causative role in the association between hypertension, insulin resistance and the metabolic syndrome? *Essays Biochem* 2006;42:163-76.
- Navab M, Anantharamaiah GM, Fogelman AM. The role of high-density lipoprotein in inflammation. *Trends Cardiovasc Med* 2005;15:158-61.
- Khovichunkin W, Kim MS, Memon RA, Shigenaga JK, Moser AH, Feingold KR, *et al.* Effects of infection and inflammation on lipid and lipoprotein metabolism: Mechanisms and consequences to the host. *J Lipid Res* 2004;45:1169-96.
- Borst SE. The role of TNF-alpha in insulin resistance. *Endocrine* 2004;23:177-82.
- Lang CH, Dobrescu C, Bagby GJ. Tumor necrosis factor impairs insulin action on peripheral glucose disposal and hepatic glucose output. *Endocrinology* 1992;130:43-52.
- Libby P. Inflammation in atherosclerosis. *Arterioscler Thromb Vasc Biol* 2012;32:2045-51.
- Furst DE, Keystone EC, Braun J, Breedveld FC, Burmester GR, de Benedetti F, *et al.* Updated consensus statement on biological agents for the treatment of rheumatic diseases, 2011. *Ann Rheum Dis* 2012;71 Suppl 2:i2-45.
- Barceló A. Cardiovascular diseases in Latin America and the Caribbean. *Lancet* 2006;368:625-6.
- Myasoedova E, Crowson CS, Kremers HM, Roger VL, Fitz-Gibbon PD, Therneau TM, *et al.* Lipid paradox in rheumatoid arthritis: The impact of serum lipid measures and systemic inflammation on the risk of cardiovascular disease. *Ann Rheum Dis* 2010;69:495.
- Toms TE, Symmons DP, Kitas GD. Dyslipidaemia in rheumatoid arthritis: The role of inflammation, drugs, lifestyle and genetic factors. *Curr Vasc Pharmacol* 2010;8:301-26.
- Watanabe J, Charles-Schoeman C, Miao Y, Elashoff D, Lee YY, Katselis G, *et al.* Proteomic profiling following immunoaffinity capture of high-density lipoprotein: Association of acute-phase proteins and complement factors with proinflammatory high-density lipoprotein in rheumatoid arthritis. *Arthritis Rheum* 2012;64:1828-37.
- Maradit-Kremers H, Nicola PJ, Crowson CS, Ballman KV, Gabriel SE. Cardiovascular death in rheumatoid arthritis: A population-based study. *Arthritis Rheum* 2005;52:722-32.
- Liang KP, Kremers HM, Crowson CS, Snyder MR, Therneau TM, Roger VL, *et al.* Autoantibodies and the risk of cardiovascular events. *J Rheumatol* 2009;36:2462-9.
- Cisternas M, Gutiérrez MA, Klaassen J, Acosta AM, Jacobelli S. Cardiovascular risk factors in Chilean patients with rheumatoid arthritis. *J Rheumatol* 2002;29:1619-22.

How to cite this article: Pitchai AM, Jawaharlal PK. Risk of Cardiovascular Disease in Rheumatoid Arthritis Patients. *Int J Sci Stud* 2020;8(8):142-145.

Source of Support: Nil, **Conflicts of Interest:** None declared.