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PATTERNS OF CARDIOVASCULAR COMORBIDITIES IN RHEUMATOID ARTHRITIS PATIENTS IN A TERTIARY CARE HOSPITAL

Dr. Chandan Saha[*1], Dr. Sujat Paul[2], Dr. M.D. Saidul Alam Rajib[3] and Dr. Dipan Baidya[4]

[1]Associate Professor (cc) & Head Department of Biochemistry, Chandpur Medical College, Chandpur, Bangladesh.
[2]Professor, Department of Medicine, Marine City Medical College, Bangadesh.
[3]Assistant Professor, Department of Medicine, Chittagong Medical College, Chittagong, Bangladesh.
[4]Associate Professor (cc) & Head, Department of Physiology, Comilla Medical College, Comilla, Bangladesh.

***Corresponding Author: Dr. Chandan Saha**

Associate Professor (cc) & Head Department of Biochemistry, Chandpur Medical College, Chandpur, Bangladesh.

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ABSTRACT

Background: Almost half of the deaths in patients of rheumatoid arthritis (RA) are due to cardiovascular diseases (CVD). Many studies have shown that patients of RA are at increased risk of mortality and morbidity from ischemic heart disease (IHD). In half of the RA patients with confirmed IHD, the disease was clinically silent. Hence, early detection of the silent IHD and other CVD is important to reduce the morbidity and mortality in patients of RA. **Objectives:** The aim of this study was to determine the pattern of cardiovascular comorbidities in RA patients. **Methods:** It was a hospital based cross- sectional study. Study was conducted at Medicine Department of Chittagong Medical College Hospital (CMCH) for six months period from July'2018 to December'2018. A total 58 diagnosed RA case were selected purposively from both outdoor and indoor of Medicine Department of CMCH. Those having different comorbid condition like stroke, heart failure, chronic kidney disease, diabetes, pregnancy, encephalopathy, bleeding disorder, hypothyroidism, hyperthyroidism or unwilling to be included in the study were excluded. Patients' demographics, serology results including rheumatoid factor (RF), anti-cyclic citrullinated peptide antibody (anti-CCP) and antinuclear antibody (ANA), as well as, disease activity score in 28 joints (DAS28) were recorded in a case record form. With all available aseptic precaution blood sample was collected and sent for FBS, 2HABF, lipid profile, serum creatinine and ESR analysis. ECG and echocardiography was done to detect cardiovascular comorbidities. **Results:** A total 58 patients enrolled, 84.5% were female, mean of age 51.74 ± 8.41years and RA disease mean duration was 3.56 ±2.16 years. Among the cardiovascular diseases only IHD was detected in the studied patients and its frequency was 13.8%. Percentage of the patients newly diagnosed as hypertensive and diabetic were 8.6% and 5.2% respectively. RA patients with IHD were 14%, had prolonged disease duration 3.56 ± 2.16 and high disease activity 27.6%. Percentages of patients had hypercholesterolemia, low high density lipoprotein (HDL), High Low density lipoprotein (LDL) were 81%, 98.3% and 100% respectively. **Conclusion:** This study evaluated newly detected cardiovascular comorbidities among RA patients. Among the CVDs only IHD was detected in the studied patients and its incidence was 13.8%. Proportions of the patients were newly diagnosed as hypertensive and diabetic were 8.6% and 5.2% respectively. RA patients with IHD were more aged, had prolonged disease duration and high disease activity.

KEYWORDS: Rheumatoid arthritis, cardiovascular diseases, ischemic heart disease.

INTRODUCTION

Rheumatoid arthritis (RA) is the most common inflammatory arthropathy worldwide with a prevalence of 0.5–1.0% in industrialized countries.[1] The annual incidence is highly variable (12 to 1,200 per 100,000 population) and is dependent on a variety of factors, including sex, ethnicity, and age.[2] RA is a chronic, multiorganic, and complex disease with an autoimmune basis. The disease is three times more frequent in women than men.[1] The prevalence of rheumatoid arthritis was 1.6% in Bangladesh.RA can damage virtually any extra articular tissue due to a systemic proinflammatory state. Cardiovascular disease (CVD) is considered an extraarticular manifestation (EAM)[3] and a major predictor of poor prognosis.[2] Several studies have documented a high prevalence of CVD in many autoimmune diseases (ADs).[4]

There has been a major improvement in the long term prognosis of RA, since the introduction of highly

effective disease modifying anti-rheumatic drugs (DMARDs) and by improved management strategies such as tight control and treat-to-target.[5] However long-term prognosis can be affected by different comorbidities, leading to increased rate of mortality in comparison with the general population. Comorbidities may be related to the disease characteristic itself or occur as a results of treatment.[6,7]

Life expectancy of patients with RA is three to ten years less than that of the general population. For severe RA, this compares to that of major killers such as triple-vessel coronary heart disease (CHD) and some lymphomas.[8] Although it is well established that cardiovascular mortality is higher in RA, the reasons for this remain elusive.[9] Currently, ischemic heart disease (IHD) secondary to atherosclerosis is the most prevalent cause of death associated with CVD in patients with RA.[10] CVD accounts for 30–50% of all deaths in RA patients.[3] Thus, RA added to CVD as the leading cause of death around the world[11,12] requires us to take these diseases more seriously. Therefore, doctors need to be more committed to assessing, monitoring, and treating cardiovascular risk factors in the early stages as well as to promoting lifestyle changes in order to diminish morbid mortality rates in RA individuals. Despite advances in treatment, the mortality of RA does not appear to have changed over the last three decades. Its control, therefore, merits at least as much attention as the reduction of disability. An obvious target is reduction of cardiovascular mortality, which accounts for almost half of all deaths in RA.[13]

However, the nature and significance of the problem is not well addressed in our country. Therefore, we have conducted this study to determine the CVD burden among RA patients in our setting.

OBJECTIVE

General Objective

To determine the pattern of cardiovascular comorbidities in rheumatoid arthritis patients.

Specific Objectives

1. To determine the frequency of newly diagnosed ischemic heart diseases in RA patients
2. To evaluate the frequency of newly diagnosed hypertension in RA patients
3. To determine the frequency of newly diagnosed valvular diseases in RA patients
4. To evaluate the frequency of other cardiovascular diseases in RA patients
5. To assess the severity of rheumatoid arthritis patients
6. To evaluate the socio-demographic profile of patients of RA patients.

MATERIALS AND METHODS

Study Design: Hospital based cross-sectional study.

Place of Study: Indoor and outdoor of Department of Medicine Chittagong Medical College Hospital, Chattogram, Bangladesh.

Study Period: Six months from 01/07/2018 to 31/12/2018.

Study Population: Patients who are the Diagnosed Case of Rheumatoid Arthritis admitted in Indoor Department and Visited OPD in Medicine Department CMCH.

Sample: Patients who made the eligibility for inclusion and exclusion criteria.

Sampling Technique: Consequence sampling

Sample Size: Considering the resources (time & fund) limitation 58 conveniently collected cases were included in the study.

Inclusion Criteria

1. Diagnosed patients of RA by ACR/EULAR Criteria, visited in indoor or OPD of CMCH
2. Age above 18 years.
3. Both sex

Exclusion Criteria

1. Patients who had other rheumatic disease like SLE, osteoathitis etc
2. Patients who had previously diagnosed comorbid condition like DM, HTN, IHD, acute confusional state (stroke/encephalopathy)
3. Subjects who did not provide written consent to participate in the study.

Procedure of the study

After getting approval from the Research and Training Monitoring Department of Bangladesh College of Physicians and Surgeons, diagnosed RA patients was included in this study. Informed written consents were taken after explaining purpose and procedure of the study from the patient. After getting consent, clinical history and physical examination was done. Next blood sample was collected and sent for biochemical analysis and other relevant investigations were done.

Data Processing and Analysis

After collection data were compiled in a Microsoft Office Excel Worksheet. Then thet were fed into SPSS (Statistical Package for Social Science) for Windows version 23 software to process and analyze the data. Continuous variables were reported as the means ± SD and categorical variables were reported as frequency (percentages). Mean of the different continuous variables were compared between ischemic and non-ischemic group by independent student' test. Statistical significance was defined as $P < 0.05$ and confidence interval set at 95% level.

RESULTS

The study was conducted in Medicine department of CMCH, among 58 RA patients to determine the pattern of cardiovascular comorbidities. The findings of the study are summarized in the following Tables and graphs:

Table- I: It shows the socio-demographic distribution of the patients. There is female predominance and most of t`hem had educational qualification below or up to SSC.

Table 1: The socio-demographic characteristics of the patients (n=58).

Variables		
Age, in years	Mean ± SD	51.74± 8.41
	Range	37-72
Sex	Male	9 (15.5%)
	Female	49 (84.5%)
	Male : Female	1:5.44
Education	Illiterate	14 (24.1%)
	Primary	24 (41.4%)
	SSC	14 (24.1%)
	HSC & above	6 (10.4%)
Occupation	Housewife	39 (67.2%)
	Service	17 (29.3%)
	Others *	2 (3.4%)

*others included occasional day- laborer, businessman, quit from service.
Data are expressed as frequency (and percentage) if not otherwise mentioned;
SD: Standard deviation

Most of the patients were rheumatoid factor (55%) and anticyclic citrulinated peptide antibody (58%) positive. All of them were taking MTX and 48% were on steroid during data collection. Mean ± SD disease duration was 3.56±2.16 years (Table II).

Table 2: The disease characteristics of the patients.

Variables		
Disease duration, in years	Mean ± SD	3.56±2.16
	Range	0.6-11
Rheumatoid factor	Positive	55 (94.9%)
	Negative	3 (5.2%)
ACPA	Positive	58 (100%)
	Negative	0 (0%)
Current medication	Methotrexate	58 (100%)
	Hydroxychloroquine	5 (8.6%)
	Steroid	10 (%)
	Salazine	3 (5.2%)

Data are expressed as frequency (and percentage) if not otherwise mentioned.
ACPA: Anticyclic citrullinated peptide antibodies

Most of the RA patients (70.7%) in the study were obese as per BMI category but central obesity was present in 22. 4% patients only (Table III).

Table 3: BMI and waisthip ratio of the patients.

Variables		
Body Mass Index (BMI), kg/m^2	Mean±SD	26.74±3.26
	Mnimum-maximum	19.9-35.2
Waist hip ratio	Mean±SD	0.97±0.25
	Mnimum-maximum	0.6-1.7
Obesity category	Normal	4 (6.9%)
	Overweight	13 (22.4%)
	Obese	41 (70.7%)
Central obesity category	Yes	13 (22.4%)
	No	45 (77.6%)

Data are presented as frequency (percentage) if not otherwise mentioned.
SD: Standrd deviation.

Figure 1: It shows that almost one in every two patients of the study had moderate disease activity (DAS28 score > 3.2 and ≤5.1). About one third patients had high disease activity (DAS 28 >5.1). Only 17.2% patients were in remission.

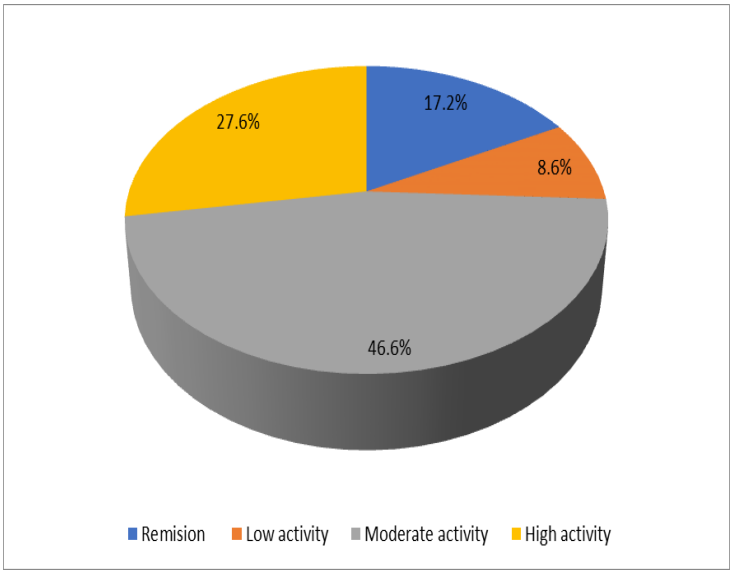

Figure 1: Disease activity of the rheumatoid arthritis patients by disease activity score 28.

On blood pressure measurement only 5 (8.6%) RA patients were found to be hypertensive (Table IV).

Table 5: Distribution of Blood pressure among the patients.

Variables		
Systolic blood pressure, mmHg	Mean±SD	131.12±11.5
	Mnimum-maximum	110-180
Diastolic blood pressure, mmHg	Mean±SD	88.3±4.83
	Mnimum-maximum	70-105
Hypertension	Yes	5 (8.6%)
	No	53 (91.4%)

Data are presented as frequency (percentage) if not otherwise mentioned.
SD: Standard deviation.

Figure- 2: It shows that out of 58 patients 40 (69%) had normal ECG. Eight (13.8%) patients had ECG findings compatible with myocardial ischaemia.

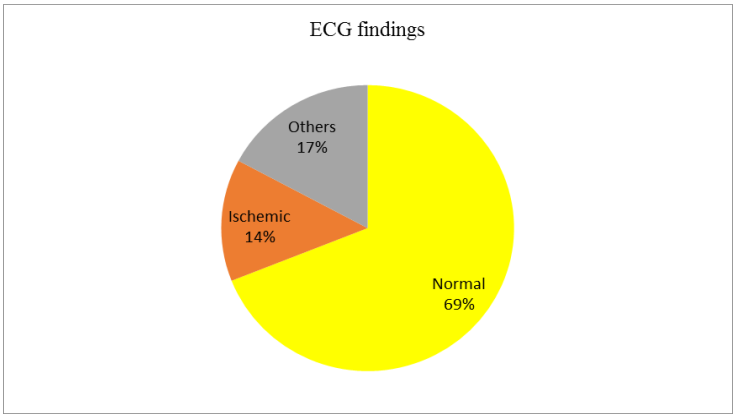

Figure 2: Distribution of the study subjects by their ECG findings (n=58).

DISCUSSION

Patients with RA have a reduced life expectancy when compared with the general population. Cardiovascular death is considered the leading cause of mortality in patients with RA; it is responsible for approximately half the deaths observed in RA cohorts. The prevalence of cardiovascular comorbidity is difficult to assess accurately, because CVD has a tendency to remain silent in the RA.[39] This hospital based descriptive cross sectional study was conducted to identify prevalence of undiagnosed CVD among the RA patients admitted or attending in the indoor and outdoor of Medicine department of Chittagong Medical College Hospital, Chattogram, Bangladesh. In total 58 RA patients were assessed clinically and by laboratory investigations.

We have found 8 (13.8%) newly detected ischemic heart disease patients out of 58 RA patients on ECG and echocardiography. Our study finding was consistent with the results of other similar study where the investigators wanted to detect silent IHD among RA patients.[40,41] Kadrekar et al.,2018,2012 had found silent IHD in 10% of the patients and Dala et al., had found silent IHD in 10.6% of the RA patients. Maradit-Kremers et al.,[42] 2005 concluded that patients with RA have a significantly higher risk of CHD when compared with non-RA subjects. Rheumatoid arthitis patients are less likely to report symptoms of angina and more likely to experience unrecognized MI and sudden cardiac death.

In the present study, the frequency of stable IHD increased in RA patients with prolonged duration, and this goes hand-to-hand with the study of Fietta et al.,[44] who reported that atherosclerosis is an early and common finding in RA patients, positively correlating to the disease duration and severity. This was also consistent with other studies.[40,41]

In our study, age was found not to have significant association with IHD in patients with RA. This is inconsistent with the results of Dala et al.,[41] and Kadrekar et al.[40] We also found that the occurrence of newly detected IHD is significantly increased in patients with RA in association with the high disease activity.

CONCLUSION

This study evaluated newly detected cardiovascular comorbidities among RA patients. Among the CVDs only IHD was detected in the studied patients and its incidence was 13.8%. Proportions of the patients were newly diagnosed as hypertensive and diabetic were 8.6% and 5.2% respectively. RA patients with IHD were more aged, had prolonged disease duration and high disease activity.

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