ORIGINAL ARTICLE

Dyslipidemia Among Patients of Rheumatoid Arthritis

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ABSTRACT

Objective: To determine the frequency of dyslipidemia among patients suffering from Rheumatoid Arthritis.

Study Design: Descriptive study.

Place and Duration of Study: The study was conducted in Medicine Department in collaboration with Pathology Department of Khalifa Gul Nawaz Teaching Hospital Bannu, Khyber Pakhtunkhwa. The duration of study was two years from January 2016 to December 2017.

Materials and Methods: A total of 187 cases were included. Inclusion criteria were all diagnosed patient of rheumatoid arthritis of any age and sex. Exclusion criteria were patients with history of diabetes mellitus, hypertension, endocrinopathies, alcohol intake and use of oral contraceptive. Fasting blood samples were analyzed to measure various fractions of lipids, blood sugar, cholesterol, thyroid hormones, and liver and kidney functions. The data collected was analyzed in SPSS version 20 for various variables. The results were presented in tables and graphs where required.

Results: In this study male to female ratio was 0.5:1. The age range was from 22 to 60 years. Average age was 43.49 years $\pm$ 10.94. Dyslipidemia was present in 48(25.67%) patients of Rheumatoid Arthritis; whereas 139(74.33%) patients didn't have dyslipidemia.

Conclusion: Rheumatoid Arthritis patients have significant dyslipidemias which may leads to increased risk of cardiovascular diseases. Early diagnosis and treatment is mandatory to reduce morbidity and mortality. Dyslipidemia must be considered an essential part of RA and may be managed appropriately and in time to avoid/ minimize complications of cardiovascular diseases.

Key Words: *Cholesterol, Dylipidemia, High density lipoprotein, Low density lipoprotein, Rheumatoid Arthritis, Triglycerides.*

Introduction

Rheumatoid arthritis is a chronic systemic inflammatory disease which mainly manifest as synovitis of multiple joints. It has prevalence of 1% with females more affected than males in 3:1 ratio.[1] Peak age of onset is between 3rd to 5th decade.[2] The frequency of dyslipidemia in general population is variable in different age groups, more in adults as compared to young. Rheumatoid arthritis patients are at 2-3 fold higher risk of atherosclerosis leading to cardiovascular diseases (CVD). As high as 50% deaths in rheumatoid arthritis are due to cardiovascular diseases.[3] The pattern of CVD in RA is different from general population. They usually have silent ischemic heart disease, sudden death and heart failure. The inflammation of rheumatoid arthritis is associated with accelerated atherosclerosis. Recent evidences show that high inflammatory status of RA is associated with lipid paradox especially serum cholesterol, inversely related to risk of CVD in untreated patients of RA. It is noted that inflammation influences lipid profile in RA patients and have a complex relationship between inflammatory burden of RA and CVD risk.[4,5]

In general population evidences show that inflammation contributes to the onset and pathogenesis of atherosclerosis leading to CVD, where as inflammation underlies progression of atherosclerosis in RA. The impact of inflammation on dyslipidemia in RA is associated with inverse relationship between CVD risk and lipids levels. A similar relation is observed in other chronic inflammatory diseases like malignancy, sepsis and post myocardial infarction cases. The mechanisms

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involved in lipid changes in this inflammatory process are not yet clear.[6-9]

The inflammation of RA is also associated with qualitative and quantitative changes of lipids profile. The HDL-C which is having a high protective role in CVD in general population is impaired in RA, leading to accentuation of CVD. Genetic studies show that fractional composition of HDL-C isolated from RA reveals significant changes.[10] These findings regarding lipid paradox and qualitative and quantitative changes in RA needs further assessment to be addressed in future. In our country we have limited research in this field, and are lacking national consensus regarding lipid monitoring in rheumatoid patients. This study will provide us with local statistics of dyslipidemias in patients of rheumatoid arthritis. The objective of the study was to determine the frequency of dyslipidemia in patients suffering from rheumatoid arthritis patients in southern region of Khyber Pakhtunkhwa Pakistan.

Materials and Methods:

This descriptive study was conducted in department of Medicine in collaboration with Pathology department of Khalifa Gul Nawaz Teaching Hospital Bannu Pakistan. The duration of study was two years from January, 2016 to December, 2017. A total of 187 cases were included. Inclusion criteria was all patients of rheumatoid arthritis both males and females of any age of more than five years disease duration as per ACR criteria 2010 were included. Exclusion criteria was patients with history of diabetes mellitus, hypertension, endocrinopathies, chronic kidney diseases, alcohol intake and use of oral contraceptive. All these diseases were excluded either by clinical manifestation or by performing relevant laboratory tests. Data was collected after approval from hospitals ethical and research committee. All patients meeting the inclusion criteria were enrolled in the study after their written informed consent from the in and out patient department. Aseptic blood sampling was performed from all patients after overnight fasting to measure total cholesterol, high density lipoprotein (HDL-C), low density lipoprotein (LDL-C) and triglyceride to confirm dyslipidemia. All these investigations were performed by a single laboratory under supervision of pathologist. All the relevant information was recorded in a pre designed proforma. The data collected was analysed for frequency with percentages and mean with standard deviation for different variables like age, total cholesterol, HDL-C, LDL-C and triglycerides. The results were presented in tables and graphs where required.

Operational definition:

Rheumatoid Arthritis: American College of Rheumatology (ACR) criteria was used for diagnosis.

1. Number and types of joints involvement.
2. Serological tests like rheumatoid factor and anti citrulinated cyclic protein antibody (anti ccp antibody).
3. Acute phase reactants i.e. Erythrocyte sedimentation rate (ESR) and C-reactive protein (CRP).
4. Duration of arthritis lasting six weeks or longer.

Dyslipidemia is defined as marked abnormal concentration of lipoproteins or lipids in the blood.[11]

1. Total cholesterol >200 mg/dl
2. High density lipoprotein (HDL) cholesterol <40mg/dl
3. Low density lipoprotein (LDL) cholesterol >130mg/dl
4. Triglycerides >150mg/dl

Results

In this study the age range of patients was from 21 to 60 years with mean age 43.49± 10.94 years. Male were 66 (35.29%) and female 121 (64.71%) with male to female ratio was 0.5:1. (Table 1) The disease was more common in age group of more than 50 years 57(30.5%) followed by age group of 41 -50 years 55(29.4%), 31-40 years 48 (25.7%) and 27 (14.4%) in age group of less than 30 years. (Table II). Dyslipidemia was present in 48 (25.67%) patients of rheumatoid arthritis, where as 139(74.33%) RA patients were free of dyslipidemia. (Fig: 1).Total cholesterol was ranged from 168-330 mg/dl with mean 212±34.96 mg/dl, HDL- C was from 23-60 mg/dl with mean 39.9±12.57 mg/dl, LDL- C was from 76-156 mg/dl with mean 99.2± 29.60 mg/dl and Triglycerides was 158-285 with mean 196± 30.64 md/dl.(Table III). Male suffered dyslipidemia relatively more common as compared to female. In male 21(31.8%) patients were suffering from dyslipidemia and in females 27(22.3%) patients were suffering from dyslipidemia and 94(77.7%) didn't have dyslipidemia.

Table I: Gender Distribution of Dyslipidemic Patients suffering from Rheumatoid Arthritis (n=48)

Gender of Patient	No. of Patients.	Percentages
Male	21	43.75%
Female	27	56.25%

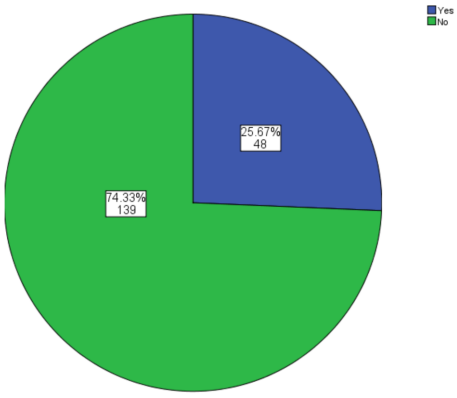

Fig 1: Frequency of Dyslipidemia in Patients suffering from Rheumatoid Arthritis

Table II: Different Age Groups of Rheumatoid Arthritis Patients Suffering From Dyslipidemia (n=48)

Age Groups In Years	No. Of Patients.	Percentages
21-30	02	4.16%
31-40	13	27.08%
41-50	13	27.08%
51-60	20	41.66%
Total	48	100%

Table III: Lipid Profile of Dyslipidemic Patients suffering from Rheumatoid Arthritis (n=48)

Lipid profile	Range mg/dl	Mean 1 SD
Total cholesterol	168-330	
HDL-cholesterol	23-60	39.9±12.57
LDL-cholesterol	76-156	92.2±29.60
Triglyceride	158-285	196±30.64

Discussion:

Dyslipidemia is frequently associated with rheumatoid arthritis. In general, in inflammation including active RA have a lipid lowering effect on blood lipid level.[12] Also RA patients have increased risk of CVD in relatively low blood cholesterol level in contrast to general population. Rheumatoid arthritis increases mortality primarily due to CVD and can reduce life expectancy by about 8-15 years. This increase mortality is mainly due to atherosclerosis and dyslipidemia is a well major recognized risk factor of atherosclerosis.[13] In this study there is diffuse derangement of lipid levels in 25.67% cases. The most common was total cholesterol in 39.58% patients followed by LDL-C in 22.92% cases and HDL-C and Triglyceride both in 18.75% cases. The age range of patients was from 22 to 60 years with mean age 43.49 years ± 10.94 years. In a study conducted by Erum et al[20] in 2017 in Karachi the age range is from 20-60 years with mean age of 36.31±10.46 years. Another study conducted by Attar et al[21] in 2015 in Saudi Arabia the mean age is 40.49±12.19 years. The common age group was from 51-60 years 57(30.5%) followed by 41 -50 years 55(29.4%), 31-40 years 48 (25.7%) and 27 (14.4%) in age group of less than 30 years. In a study conducted by Erum et al[20] the common age group is 31-40 years 37.5% followed by 20-30 years 32%, 41-50 years 24% and 51-60 years 6.5%. Another study conducted by Hameed et al[19] in 2017 in Iraq the common age group is 50-59 years 345 followed by 40-49 years 22%, 30-39 years 16%, 60-69 years 13% and less than 30 years 12%. Male patients were 66 (35.29%) and female 121(64.71%) and male to female ratio of 0.5:1. In a study conducted by Erum et al[20] male are 11.5% and female 88.5% with male to female ratio of 0.12:1.

Table: IV. Comparison of frequency of Dyslipidemia in Various Studies

Present Study	Willerson et al[14]	Scott et al[15]	Hadda et al[16]	Soubrier et al[17]
25.67%	18%	24%	38.5%	42%
Nisar et al[18]	**Hameed et al[19]**	**Erum et al[20]**	**Attar et al[21]**	**Zrour et al[22]**
45%	47%	53.5%	55%	65.9%

This comparison of dyslipidemia in rheumatoid arthritis show almost same frequency of dyslipidemia in study done by willerson et al[14] and Scott et al.[15] All other studies in above table show high frequency of dyslipidemia as compared to the present study. The reason may be difference in activity of disease during sample collection, different treatment modalities used, patients food habits, epidemiology and life style.

Amongst the dyslipidemic patients the Total Cholesterol was 212.3±34.96 mg/dl, HDL-C was 39.9±12.57 mg/dl, LDL-C was 99.2± 29.60 mg/dl and Triglycerides was 196± 30.64 mg/dl. Erum et al[14] show Total Cholesterol as 169.68±36.68 mg/dl, HDL-C 40.02±10.23 mg/dl and LDL-C 93.28±26.17 mg/dl. In Hammed et al[16] Total Cholesterol is 177.6±39.2 mg/dl, HDL-C 44.6±10.9 mg/dl, LDL-C 101.7±30.9 mg/dl and Triglyceride is 148.8±70.9 mg/dl. These studies like present study show low level of HDL-C amongst the dyslipidemic patients of RA, which in

high level is cardio protective. Also these studies like present study show high level of LDL-C which is associated with increased risk of CVD in RA patients and the same is true for TC and TG in high level. The small sample size, current laboratory assessment tools and lack of causal relationship between lipid level and inflammatory activities of RA are the limitation of this study. It is suggested to incorporate modern laboratory technique in routine practice for assessment of various fractions of lipids. This study confirms dyslipidemia in RA patients, there might be differences in pattern of dyslipidemia amongst different racial and ethnic group as well as from country to country depending on food habits, religious belief and life style.

Conclusion:

Rheumatoid Arthritis patients have significant dyslipidemias which may leads to increased risk of cardiovascular diseases. Early diagnosis and treatment is mandatory to reduce morbidity and mortality. Dyslipidemia must be considered an essential part of RA and may be managed appropriately and in time to avoid/ minimize complications of cardiovascular diseases.

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