# Abnormal Lipid Profile and its Association with the Type of Disease Modifying Antirheumatic drugs among Rheumatoid Arthritis Patients

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## ABSTRACT

Background: Patients suffering from rheumatoid arthritis (RA) may have abnormal lipid profile increasing the likelihood of cardiovascular diseases. Biological or targeted synthetic disease modifying antirheumatic drugs (DMARDs) have different mechanism of action than conventional DMARDs.

Objective: To determine the effects of type of disease modifying antirheumatic drugs on prevalence of abnormal lipid profile among RA patients.

Study design: Cross-sectional study

Place and duration of study: Al-Aleem Medical College Lahore and Gujranwala Medical College Gujranwala from 1st December 2022 to 30th May 2023.

Methodology: One hundred and sixteen rheumatoid arthritis patients were recruited from medical outpatient departments. Fasting lipid profile was assessed. Non obese patients of both genders, with diagnosis of rheumatoid arthritis were included. Smokers and obese patients were excluded.

Results: 44.8% patients had abnormal lipid profile. 53% were on conventional DMARDs while 46% were using biological or targeted synthetic DMARDs. Abnormal lipid profile was associated with the duration of the disease greater than 5 years. It was not associated with type of DMARDs or severity of disease.

Conclusion: The abnormal lipid profile is not associated with type of disease modifying antirheumatic drugs i.e. conventional or biological or targeted synthetic DMARDs.

Keywords: Cardiovascular diseases, Conventional versus non-conventional DMARDs, Abnormal lipid profile, Arthritis.

## INTRODUCTION

The prevalent form of polyarticular inflammatory arthritis is rheumatoid arthritis (RA). It is distinguished by bony erosions, persistent articular degeneration, progressive svnovial inflammation, and ultimately resulting in varying degrees of disability.<sup>1,2</sup> Its outcomes include poor quality of life, loss of quality adjusted life years, mortality, increased hospitalization, work disability, medical costs, , and cardiovascular diseases (CVD).2,3 The risk of cardiovascular diseases elevated among the patients with rheumatoid arthritis that may not consistently be linked to traditional cardiovascular risk factors.4-6

Abnormal lipid profile has been recognized as one of the predictors of CVD in general population, with high low density lipoprotein (LDL) levels and low high density lipoprotein (HDL) levels.<sup>7,8</sup> In Rheumatoid arthritis, abnormal lipid profile predominantly manifests as reduced concentrations of high-density lipoprotein, which is linked with an unfavourable cardiovascular risk.<sup>3,9,10</sup>

High density lipoprotein and total cholesterol levels have an inverse correlation with the acute phase response, irrespective of the administration of anti-rheumatic therapy to patients. A local study also report various types of abnormal lipid profile were found in 54% of patients.<sup>11</sup> The objective of this study is to determine the association abnormal lipid profile in rheumatoid arthritis patients with type of DMARDs i.e. conventional versus biological or targeted synthetic DMARDs. Local prevalence of abnormal lipid profile among RA population may help screen the patients with increased risk of cardiovascular events.

### MATERIALS AND METHODS

A cross-sectional survey was carried out in the outpatient departments of Al-Aleem Medical College Lahore and Gujranwala Medical College, Gujranwala. The estimated sample size was 116 patients, calculated with a confidence level of 95% and a 10%

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margin of error, assuming an expected abnormal lipid profile prevalence of 54% among RA patients. Inclusion criterion was patients of either gender with diagnosis of rheumatoid arthritis with least duration of at least six months and normal body mass index (BMI 19-25). Smokers, diabetics, patients with history of coronary artery disease; patients on lipid-lowering drugs (assessed on clinical record), and patients chronic systemic or metabolic disorder (assessed on clinical record) were excluded. Abnormal lipid profile was defined by presence of one or more than one abnormal serum lipid concentration of either triglyceride (>150 mg/dl), or LDL (>100 mg/dl) cholesterol (>150 mg/l) or HDL (<40 mg/dl) or VLDL (>32 mg/dl). After informed consent, included patients were interviewed for complete medical history followed by a physical examination that included measuring blood pressure with a sphygmomanometer and body mass index. Eight hour fasting blood sample (5ml) was taken for laboratory analysis of lipid profile. Patients were labeled for abnormal lipid profile according to operational definition. The data was entered and analyzed through SPSS-23. Chi-square test was applied to determine the difference in frequency of abnormal lipid profile across two groups. A p value <0.05 was taken as significant.

### RESULTS

44.8% patients of sampled population (n=116) had abnormal lipid profile. 53% were on conventional DMARDs (disease modifying anti rheumatoid drugs) while 46% were using non- conventional DMARDs among sampled population. 63% population has disease duration greater than 3 years and 21% patient has low disease activity while 51% has moderate disease activity. 27% has severe disease (Table 1).

When we cross tabulated type of treatment for rheumatoid arthritis with abnormal lipid profile, we find that abnormal lipid profile is not significantly different between patients on conventional or non-conventional DMARDs (p=0.56). When we cross tabulated duration of disease >3 years with abnormal lipid profile, we find that abnormal lipid profile is higher among patients who has disease more than 3 years (p<0.001). When we cross tabulated, disease severity by DAS28with abnormal lipid profile,

we find that abnormal lipid profile is not significantly different 2]. between patients with different severity of disease (p=0.78) [Table

Table 1: Sociodemographic profile of sampled rheumatoid arthritis patients (n=116)

Variable	NO.	%
Treatment of rheumatoid arthritis		
Conventional DMARDs	62	53.4
Non-conventional DMARDs	54	46.6
Abnormal lipid profile		
Yes	52	44.8
No	64	55.2
Disease duration >3 years		
Yes	74	63.8
No	42	36.2
Disease severity by DAS28		
Low disease activity	24	20.7
Moderate disease activity	60	51.7
High Disease activity	32	27.6

Table 2: Cross tabulation between abnormal lipid profile and sociodemographic profile of sampled rheumatoid arthritis patients (n=116)

Variable		Abnormal lipid profile				
		Yes		No		P value
		No.	%	No.	%	
Treatment of rheumatoid arthritis	Conventional DMARDs	24	20.7	38	32.8	0.56
	Non-conventional DMARDs	28	24.1	26	22.4	0.56
Disease duration > 3 years	Yes	52	44.8	22	19.0	-0.001
	No	0	-	42	36.2	<0.001
Disease severity by DAS28	Low disease activity	10	8.6	14	12.1	
	Moderate disease activity	26	22.4	34	29.3	0.78
	High Disease activity	16	13.8	16	13.8	

#### DISCUSSION

Rheumatoid arthritis (RA) may lead to disabilities decreasing high density lipoproteins (HDL) and increased levels of low and very low-density lipoproteins (LDLs, VLDLs).<sup>1,3,12,13</sup> Abnormal lipid profile is a critical predictor of cardiovascular disease (CVD) and identified as the primary therapeutic objective in national guidelines.9 In the present study, 44.8% patients had abnormal lipid profile. Our results are comparable with those previously reported. A study reported prevalence of abnormal lipid profile was 48% in patients having RA.<sup>6</sup> Another study reported that 54% of RA patients had abnormal lipid profile.<sup>11</sup> The reason of this difference may be included population diversity, treatment modality like corticosteroids and operational definition of abnormal lipid profile. This study showed that abnormal lipid profile is not significantly different between patients on conventional or nonconventional DMARDs (p>0.05). The results are comparable with those of Min et al14 and Curtis et al.15

Duration of disease >3 years was cross tabulated with abnormal lipid profile, we found that abnormal lipid profile is higher among patients who has disease more than 3 years (p<0.001). This implies that duration of disease that may be associated with disability is more likely to affect the lipid profile. Similarly, when we cross tabulated disease severity by DAS28 with abnormal lipid profile, we find that abnormal lipid profile is not significantly different between patients with different severity of disease (p>0.05). This implies that severity of disease is not a marker for start of lipid lowering therapy.

### CONCLUSION

The abnormal lipid profile is not associated with type of disease modifying antirheumatic drugs i.e. conventional or biological or targeted synthetic DMARDs. The frequency of abnormal lipid profile is quite high (44.8%) in our population presenting with rheumatoid arthritis. It implies that both conventional and non-conventional DMARDs like targeted synthetic and biologic DMARDs do not make a difference in frequency of abnormal lipid profile.

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