



Original Article

Alteration of Lipid profile in patients of Rheumatoid arthritis in a Tertiary Care Hospital in Central India

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Abstract

Aim & Objective: Rheumatoid arthritis (RA) is a chronic systemic autoimmune disorder characterized by symmetrical synovitis, progressive damage to the articular cartilage and the subchondral bone⁽¹⁾, as well as pain, fatigue, and disability⁽²⁾. The purpose of this study was to investigate any significant correlation in the level of Lipid profile and its association with severity of Rheumatoid arthritis

Material and Methods: Total 100 study subjects were divided into two groups, group A comprising 50 apparently healthy controls and group B comprising 50 patients of rheumatoid arthritis, which is further divided into subgroups on the basis of DAS 28 Score, group B1- remission, group B-2 included mild cases of rheumatoid arthritis, group B-3 of moderate & group B-4 of severe cases of rheumatoid arthritis. Subjects were enrolled after applying all inclusion and exclusion criteria and written informed consent were taken. Serum Lipid profile estimation were done by Transasia XL-640 Automated analyzer.

Results: The mean triglycerides in the control group was 121.28 ± 21.96 mg/dL while in the rheumatoid arthritis group was 156.32 ± 63.58 mg/dL. The mean VLDL in the control group was 24.26 ± 4.39 mg/dL while in the rheumatoid arthritis group was 31.26 ± 12.72 mg/dL. The difference was found to be statistically significant ($p < 0.05$), showing a higher Triglycerides & VLDL in the rheumatoid arthritis group in comparison to the control group.

Conclusion: Patients with RA and chronic systemic inflammation have altered lipoprotein and apolipoprotein levels that may contribute to their higher risk of atherosclerosis

Keywords: Rheumatoid arthritis, Triglyceride, VLDL, Lipid profile.

Introduction

Rheumatoid arthritis (RA) is a chronic systemic autoimmune disorder characterized by symmetrical synovitis, progressive damage to the articular cartilage and the subchondral bone⁽¹⁾, as

well as pain, fatigue, and disability⁽²⁾. The purpose of this study was to investigate any significant correlation in the level of Lipid profile and its association with severity of Rheumatoid arthritis. There is increasing prevalence of RA all over the

world due to population growth, aging, urbanization, poverty, infectious disease & poor access to modern health care facilities. According to recent studies, approximately 0.5-1% of adult population world wise with female to male ratio 2.5:1 is affected by RA⁽³⁾ & the peak incidence onset occurs between 30 to 50 years of age⁽⁴⁾. As the prevalence of RA is rising among India, affects about 0.75 of adult Indian population⁽⁵⁾. Rheumatoid arthritis is diagnosed in patients that fulfil American College of Rheumatology and European League Against Rheumatism, (ACR-EULAR) in the 2010 Rheumatoid arthritis classification criteria⁽⁶⁾. If RA is not treated, then patient may experience joint deterioration, severe disability, decreased quality of life, increase comorbidities and cause premature mortality⁽⁷⁾. The natural history of RA varies from self-limited, non-erosive to severe, destructive disease. The disease onset of RA may be acute, subacute or insidious. RA may begin as mono-arthritis from one joint and then gradually spread to other joints, or as polyarthritis⁽⁸⁾.

Approximately 60% of RA patients present with fatigue, anemia, generalized weakness, anorexia and nonspecific musculoskeletal symptoms before the appearance of synovitis⁽⁹⁾.

Material and Methods

Total 100 study subjects were divided into two groups, group A comprising 50 apparently healthy controls and group B comprising 50 patients of rheumatoid arthritis, which is further divided into

subgroups on the basis of DAS 28 Score, group B1- remission, group B-2 included mild cases of rheumatoid arthritis, group B-3 of moderate & group B-4 of severe cases of rheumatoid arthritis. Subjects were enrolled after applying all inclusion and exclusion criteria and written informed consent were taken. Serum Lipid profile estimation were done by Transasia XL-640 Automated analyzer.

Excluded from the study were subjects with

- Past history of other autoimmune disease.
- Spondyloarthropathy
- Diabetes mellitus
- Oncological disease
- Chronic kidney disease
- Chronic liver disease
- Pregnancy
- Alcoholism
- Smoking

Results

The mean triglycerides in the control group was 121.28 ± 21.96 mg/dL while in the rheumatoid arthritis group was 156.32 ± 63.58 mg/dL. The mean VLDL in the control group was 24.26 ± 4.39 mg/dL while in the rheumatoid arthritis group was 31.26 ± 12.72 mg/dL. The difference was found to be statistically significant ($p < 0.05$), showing a higher Triglycerides & VLDL in the rheumatoid arthritis group in comparison to the control group.

Table No. 1 Comparison of various biochemical parameters between the two groups

Parameter	Control group (Mean±SD)	Rheumatoid Arthritis Group (Mean±SD)	't' value	P value
Cholesterol	167.02 ± 25.87	169.14 ± 32.93	-0.358, df=98	0.721, NS
HDL	50.15 ± 6.95	47.35 ± 9.49	1.682, df=98	0.096, NS
LDL	93.13 ± 27.38	90.52 ± 28.67	0.466, df=98	0.643, NS
Triglycerides	121.28 ± 21.96	156.32 ± 63.58	-3.683, df=98	0.000*
VLDL	24.26 ± 4.39	31.26 ± 12.72	-3.683, df=98	0.000*
Uric acid	3.98 ± 1.39	4.04 ± 1.57	-0.206, df=98	0.838, NS

Unpaired 't' test applied. P value < 0.05 was taken as statistically significant.

The above table shows the comparison of mean biochemical parameters between the two groups.

Cholesterol:- The mean cholesterol in the control group was 167.02 ± 25.87 mg/dL while in the rheumatoid arthritis group was 169.14 ± 32.93 mg/dL. The difference was not found to be statistically significant ($p>0.05$), showing a comparable mean cholesterol in both the groups.

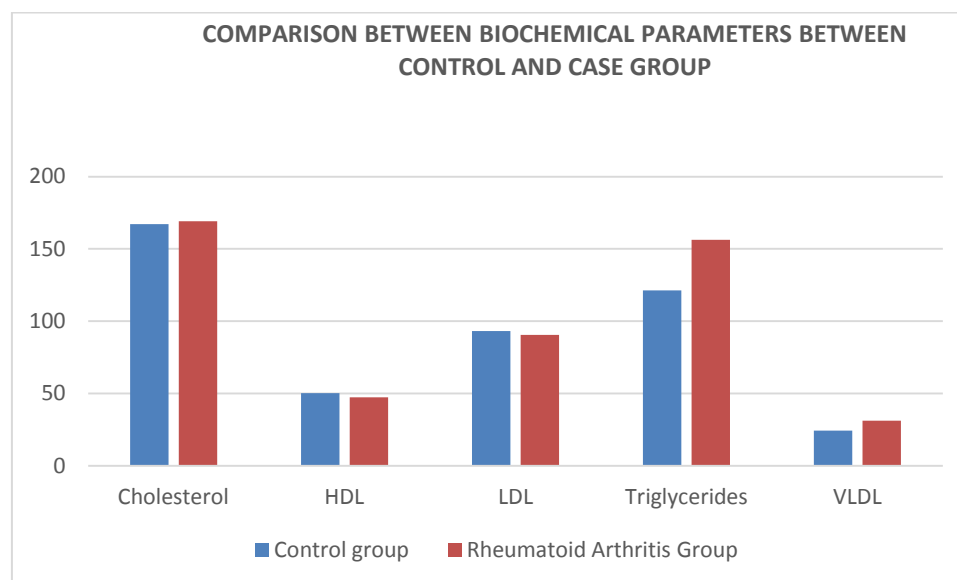
HDL: The mean HDL in the control group was 50.15 ± 6.95 mg/dL while in the rheumatoid arthritis group was 47.35 ± 9.49 mg/dL. The difference was not found to be statistically significant ($p>0.05$), showing a comparable mean HDL in both the groups.

LDL: The mean LDL in the control group was 93.13 ± 27.38 mg/dL while in the rheumatoid arthritis group it was 90.52 ± 28.67 mg/dL. The difference was not found to be statistically

significant ($p>0.05$), showing a comparable mean LDL in both the groups.

Triglycerides: The mean triglycerides in the control group was 121.28 ± 21.96 mg/dL while in the rheumatoid arthritis group was 156.32 ± 63.58 mg/dL. The difference was found to be statistically significant ($p<0.05$), showing a higher triglyceride in the rheumatoid arthritis group in comparison to the control group.

VLDL: The mean VLDL in the control group was 24.26 ± 4.39 mg/dL while in the rheumatoid arthritis group was 31.26 ± 12.72 mg/dL. The difference was found to be statistically significant ($p<0.05$), showing a higher VLDL in the rheumatoid arthritis group in comparison to the control group.



Graph 1: Bar diagram showing comparison of biochemical parameters in control group and rheumatoid arthritis group

In our study the mean cholesterol level in the control group was 167.02 ± 25.87 mg/dL while in the rheumatoid arthritis group was 169.14 ± 32.93 mg/dL. The result was not found to be statistically significant ($p>0.05$), showing a comparable mean cholesterol in both the groups. Mean triglyceride level was 121.28 ± 21.96 in control group and 156.32 ± 63.58 in RA group with p value of 0.000 that was found to be statistically significant. Similar findings were observed in study of *Mona Abo-Ragab (2012)*⁽¹⁰⁾ i.e. total cholesterol in

control group was 136.02 ± 19.03 while in RA group was 138.70 ± 15.22 with p value >0.05 that was not statistically significant and triglyceride level in control group was 76.72 ± 13.98 while in RA group was 90.85 ± 35.19 with p value <0.05 . *Uzma Erum et al.(2017)*⁽¹¹⁾ study showed that mean values for total cholesterol was 169.68 ± 36.68 mg/dL.

In our study the mean HDL in the rheumatoid arthritis group was 47.35 ± 9.49 mg/dL while in the control group was 50.15 ± 6.95 mg/dL. The

difference was not found to be statistically significant ($p>0.05$), showing a comparable mean HDL in both the groups. In study of *George Steiner et al* ⁽¹²⁾ there was consistently lower level of HDL in RA patients compare to control, while in study of *Uzma Erum et al. (2017)*⁽¹¹⁾ mean HDL level was 40.02 ± 10.23 mg/ dL that was also towards lower side. As dyslipidemia observed in RA is a frequent occurrence and may be considered as a secondary impact of chronic inflammatory state seen in RA patients. Due to dyslipidemia there is increased risk of cardiovascular disease.

Conclusion

Patients with RA and chronic systemic inflammation have altered lipoprotein levels that may contribute to their higher risk of atherosclerosis. In RA dyslipidemia considered as secondary impact, therefore identification & management of dyslipidemia should be an integral part of RA therapeutic strategies to prevent further CVD events.

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