

**Study on Serum Lipid Profile in Patient with Atherosclerosis: A Hospital-Based Retrospective Descriptive Study**Varun Kumar<sup>1</sup>, Ashwini Kumar<sup>2</sup>, Rajnish Kumar<sup>3</sup>, Prachi Satyam<sup>4</sup>, Usha Kumari<sup>5</sup><sup>1</sup>PG Student, Department of Biochemistry, B.M.I.M.S., Pawapuri, Nalanda, Bihar, India<sup>2</sup>PG Student, Department of Biochemistry, B.M.I.M.S., Pawapuri, Nalanda, Bihar, India<sup>3</sup>Tutor, Department of Biochemistry, B.M.I.M.S., Pawapuri, Nalanda, Bihar, India<sup>4</sup>Junior Resident, Department of Ophthalmology, B.M.I.M.S., Pawapuri, Nalanda, Bihar, India<sup>5</sup>Professor, Department of Biochemistry, B.M.I.M.S., Pawapuri, Nalanda, Bihar, India

Received: 25-03-2024 / Revised: 23-04-2024 / Accepted: 25-05-2024

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Conflict of interest: Nil

**Abstract:**

Serum lipid levels affect atherosclerosis, a key cause of cardiovascular disease. This hospital-based retrospective descriptive study examined blood lipid profiles and atherosclerosis severity in 60 BMIMS, Pawapuri Nalanda, Bihar, patients for 8 months. The study found that high LDL and triglycerides were positively connected with atherosclerosis severity, but HDL was protective. LDL and triglycerides were greater in men than women. These findings emphasize focused cholesterol management in atherosclerosis prevention and treatment, suggesting that personalized therapeutic techniques may improve cardiovascular health. This work contributes to the understanding of lipid profiles in atherosclerosis progression and emphasises aggressive lipid treatment based on risk profiles.

**Keywords:** Atherosclerosis, Serum Lipid Profiles, Dyslipidemia, Cardiovascular Risk Management.

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**Introduction**

The major etiology of many cardiovascular disorders, atherosclerosis is defined by the gradual build-up of inflammatory cells, fibrous materials, and lipids in the major arteries. The artery lumen becomes narrowed and hardened as a result of this degenerative process, which greatly increases the risk of major cardiovascular events such as peripheral arterial disease, myocardial infarction, and stroke. An important part of the pathophysiology of atherosclerosis is the serum lipid profile, which consists of cholesterol, triglycerides, low-density lipoprotein (LDL), and high-density lipoprotein (HDL) [1,2].

The goal of the current study is to clarify how blood cholesterol levels relate to the frequency and degree of atherosclerosis in patients who are admitted to our hospital. Given the significant prevalence of cardiovascular illnesses worldwide and the link between dyslipidemia and cardiac illnesses, it is essential to comprehend these linkages to create focused prevention and treatment approaches [3]. To find trends and patterns in the lipid profiles of patients who have received an atherosclerosis diagnosis within the last five years, this retrospective descriptive study examines medical records from the hospital's database. The study aims to provide important insights into the relationship between cholesterol levels and the severity and

progression of atherosclerosis by analyzing these patterns. These findings could potentially inform clinical practices related to lipid management and risk assessment in patients with atherosclerosis [4,5].

The results of this study may potentially help to improve the recommendations for treating and screening for lipid abnormalities in the context of managing cardiovascular risk. This study contributes to the larger objective of optimizing blood cholesterol level control to lower the incidence and consequences of atherosclerotic cardiovascular illnesses.

**Methodology**

**Study Design:** This study employs a hospital-based retrospective descriptive design to investigate the serum lipid profiles in patients with atherosclerosis at BMIMS, Pawapuri Nalanda, Bihar.

**Study Period:** The data collection phase spans for 8 months, focusing on the medical records of patients diagnosed with atherosclerosis during this timeframe.

**Study Population:** The study includes a total of 60 patients who were diagnosed with atherosclerosis, as identified by the hospital's medical records department. Patients included in the study were

those with a confirmed diagnosis based on clinical findings, imaging studies, and other relevant diagnostic criteria.

**Data Collection:** BMIMS EHR data will be retroactively collected. Age, sex, medical history, clinical data, and blood lipid profiles (total cholesterol, LDL, HDL, and triglycerides) are retrieved. This study will examine lipid levels at the time of atherosclerosis diagnosis.

#### Inclusion Criteria

1. Patients diagnosed with atherosclerosis based on clinical and radiological criteria.
2. Patients who have a complete record of serum lipid profiles at the time of diagnosis.

#### Exclusion Criteria

1. Patients with incomplete medical records or missing data on serum lipid profiles.
2. Patients receiving lipid-altering therapy before the diagnosis of atherosclerosis.

**Data Analysis:** The descriptive statistical evaluation will use the software. Continuous variables like age and cholesterol levels are presented as mean  $\pm$  standard deviation, whereas categorical variables like sex are summarized as frequencies and percentages. As needed, correlation coefficients and regression analysis will examine lipid profiles and atherosclerosis severity.

#### Results

**This table summarizes the average lipid values among the study participants and correlates these values with the severity of atherosclerosis. It highlights the differences between male and female patients and the significance of these differences in the severity of the disease.**

Parameter	Mean $\pm$ SD (Overall)	Mean $\pm$ SD (Males)	Mean $\pm$ SD (Females)	Correlation with Severity
Total Cholesterol (mg/dL)	220 $\pm$ 30	-	-	-
LDL Cholesterol (mg/dL)	140 $\pm$ 35	145 $\pm$ 30	130 $\pm$ 40	0.75 (p < 0.01)
HDL Cholesterol (mg/dL)	40 $\pm$ 5	38 $\pm$ 5	43 $\pm$ 5	-0.55 (p < 0.05)
Triglycerides (mg/dL)	150 $\pm$ 20	160 $\pm$ 25	135 $\pm$ 15	0.65 (p < 0.01)

#### Discussion

In patients at BMIMS, Pawapuri Nalanda, Bihar, our study showed strong connections between serum lipid levels and the degree of atherosclerosis. Significantly, elevated levels of triglycerides and

The study included 60 patients with atherosclerosis, consisting of 38 males (63.3%) and 22 females (36.7%). The age distribution ranged from 45 to 75 years, with a mean age of  $62 \pm 7$  years. The majority of patients (60%) had a history of hypertension, and 45% had a history of diabetes mellitus.

#### Serum Lipid Profiles

The analysis of serum lipid profiles revealed the following mean values across the study population:

- Total Cholesterol: 220  $\pm$  30 mg/dL
- LDL Cholesterol: 140  $\pm$  35 mg/dL
- HDL Cholesterol: 40  $\pm$  5 mg/dL
- Triglycerides: 150  $\pm$  20 mg/dL

**Lipid Profiles and Atherosclerosis Severity:** A substantial positive connection ( $r = 0.75$ ,  $p < 0.01$ ) was identified among LDL cholesterol levels and atherosclerosis severity. Similarly, triglyceride levels were moderately linked with atherosclerosis severity ( $r = 0.65$ ,  $p < 0.01$ ). Conversely, HDL cholesterol negatively correlated with atherosclerosis severity ( $r = -0.55$ ,  $p < 0.05$ ).

**Gender Differences in Lipid Profiles:** Male patients had higher mean LDL (145  $\pm$  30 mg/dL) and triglyceride (160  $\pm$  25 mg/dL) values than females (LDL: 130  $\pm$  40 mg/dL, Triglycerides: 135  $\pm$  15 mg/dL), although these differences were not statistically significant ( $p > 0.05$ ). Males had lower HDL levels (38  $\pm$  5 mg/dL) compared to females (43  $\pm$  5 mg/dL), with a significant difference ( $p < 0.05$ ).

LDL cholesterol were linked to a worsening of atherosclerosis, whereas elevated levels of HDL cholesterol seemed to have a preventive impact [6]. The established theory that LDL is a primary atherogenic lipoprotein is supported by the positive relationship observed between LDL cholesterol and

the degree of atherosclerosis. Raised low-density lipoprotein (LDL) levels increase the risk of cardiovascular disease by promoting the development and advancement of atheromatous plaques. These results align with those of the Framingham Heart Study (Kannel et al., 1971) [3], which showed low-density lipoprotein (LDL) cholesterol to be a major risk factor for coronary artery disease [7,8].

On the other hand, our findings corroborate HDL cholesterol's protective function against atherosclerosis, as seen by its inverse relationship with the severity of the condition. Reverse cholesterol transfer, a vital process for eliminating cholesterol from artery walls is aided by HDL [9]. Higher HDL levels were linked to a lower risk of major cardiovascular events in the Veterans Affairs HDL Intervention Trial (VA-HIT), which also revealed an inverse connection between HDL levels and cardiovascular events (Rubins et al., 1999) [4]. The significance of triglycerides as an independent risk factor for cardiovascular disease is highlighted by the study's finding of a somewhat favorable connection between triglyceride levels and the severity of atherosclerosis [10,11]. This is consistent with the Copenhagen City Heart Study's findings, which revealed that, even in the absence of other established risk factors, non-fasting triglyceride levels are a reliable indicator of ischemic heart disease (Bansal et al., 2007) [5].

Males showed slightly higher levels of LDL and triglycerides than females, according to the gender-specific analysis, which may indicate a gender-specific risk profile. This finding is significant for modifying lipid-lowering tactics, and it may be investigated further in focused interventions. Prior research, such as that conducted by Regitz-Zagrosek (2012) [9], has brought attention to the potential impact of gender variations in lipid metabolism on cardiovascular risk and treatment results [12,13]. The associations found in this study highlight the necessity of treating dyslipidemia aggressively in patients who have atherosclerosis or are at risk for it. Clinicians should take these correlations into account when developing cardiovascular disease prevention and treatment plans [14]. To clarify the causal connections and possible mechanisms relating lipid profiles to the development of atherosclerosis, more long-term research is needed. Furthermore, investigating the effects of lipid-modifying therapies on the long-term consequences of atherosclerosis would yield important information about practical approaches to cardiovascular risk reduction [15].

### Conclusion

The present retrospective descriptive study at BMIMS, Pawapuri Nalanda, Bihar, shows that serum lipid profiles are strongly correlated with

atherosclerosis severity, with elevated LDL and triglycerides bad and HDL cholesterol good. The gender-specific differences suggest that males have a higher lipid-associated atherosclerosis risk. These findings support aggressive dyslipidemia therapy and personalized lipid-lowering regimens based on risk profiles. This study emphasizes the need for comprehensive cholesterol control in cardiovascular risk reduction and lays the groundwork for improving atherosclerosis treatments.

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