

FREQUENCY OF HYPERTRIGLYCERIDEMIA IN PATIENTS PRESENTING WITH ACUTE CORONARY SYNDROME AT PAF HOSPITAL MUSHAF

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ABSTRACT:

Objectives: To determine the frequency of hypertriglyceridemia in patients presenting with Acute Coronary Syndrome at PAF Hospital Mushaf.

Materials and Methods: A total of 246 eligible patients were enrolled from the Department of Medicine, PAF Hospital Mushaf, Sargodha, after obtaining informed consent from patients or their attendants. Demographic and clinical information was recorded, and 5 mL blood samples were collected for fasting lipid profile assessment. Relevant histories, including familial hypertriglyceridemia, lipid-lowering drug use, family history of ACS, diabetes, hypertension, and smoking, were documented. Data were collected by the researcher using a pre-designed proforma and analyzed using SPSS version 25.

Results: Among 246 patients, the mean age was 54.49±12.43 years, with 54.5% males and 45.5% females. Hypertriglyceridemia was present in 175 (71.1%) patients. No significant association was found with age, gender, BMI, education, hypertension, smoking, or family history of ACS ($p>0.05$); however, diabetes mellitus showed a borderline significant association ($p=0.05$).

Conclusion: It was concluded that hypertriglyceridemia was highly prevalent among patients with ACS.

KEYWORDS: Hypertriglyceridemia, Acute Coronary Syndrome, diabetes mellitus

INTRODUCTION:

Coronary artery disease has become a leading cause of death worldwide, affecting not only Western countries but also Asian nations such as Pakistan (1). It is a major global health concern, responsible for 28% of 50.4 million deaths in 1990 and rising to 30% of 58 million deaths in 2005 worldwide. If its associated risk factors remain unaddressed, projections indicate that by 2030, with the global population expected to reach 8.2 billion, CVD will account for 33% (24.2 million) of all deaths (2). Dyslipidemia refers to an abnormal level of lipids (such as triglycerides, HDL, LDL, and VLDL) in the blood. It has emerged as a widespread global health issue and is strongly linked to an increased risk of cardiovascular diseases (CVDs). Multiple international studies have confirmed an association between dyslipidemia and an elevated risk of CVD. With lifestyle changes such as reduced physical activity and unhealthy dietary habits, it has emerged as a significant public health concern. Managing and correcting dyslipidemia can significantly reduce the overall burden of cardiovascular disease (3). Various randomized controlled trials and epidemiological studies have indicated that elevated low-density lipoprotein (LDL) is a major risk factor for cardiovascular disease and should be the primary target for its reduction. LDL has traditionally been the main focus in screening patients with dyslipidemia and CAD. Elevated LDL levels and reduced HDL concentrations are recognized as key risk factors for CAD (4). Hypertriglyceridemia, defined as elevated triglyceride levels in the blood, is an important risk factor for cardiovascular diseases (CVD), particularly acute coronary syndrome (ACS). Acute Coronary Syndrome (ACS) is a serious medical emergency caused by a sudden reduction in blood flow to the heart. It includes unstable angina, NSTEMI, and STEMI heart attacks and is a leading cause of death and disability worldwide (5). The significance of lipids and lipoproteins as major risk factors for ischemic heart disease is widely acknowledged. Within this group, plasma triglycerides and high-density lipoprotein (HDL) cholesterol have been the subject of considerable research in cardiovascular epidemiology (6).

Elevated triglyceride levels have long been associated with CVD. However, with the widespread use of statins, the primary emphasis has shifted toward lowering LDL levels, causing the importance of triglycerides to be somewhat overlooked (7). A recent local study reported hypertriglyceridemia in 83.33% of patients with ACS, whereas another study found it in 50.1% of cases (8). Another study demonstrated that hypertriglyceridemia was frequently observed (occurring in 80% of patients) among those presenting with ACS at the coronary care unit of DHQ-TH Bannu (9). One more study showed lower frequency of hypertriglyceridemia among patients with

acute coronary syndrome. The author reported that among 147 patients with ACS, 51.7% (76 patients) had hypertriglyceridemia, and 48.3% (71 patients) did not (10).

The majority of patients presenting with acute coronary syndrome are often unaware of their lipid profile (9). Previous studies have reported wide variation in the frequency of hypertriglyceridemia among ACS patients, emphasizing the need for further research to determine its true prevalence in our population. Establishing this association is crucial, as it will provide valuable baseline data for our local setting, where literature on this subject remains scarce. Understanding the true magnitude of the problem will enable more effective management of ACS patients with hypertriglyceridemia. Therefore, this study has been designed to address this gap.

Objective: To determine the frequency of hypertriglyceridemia in patients presenting with Acute Coronary Syndrome at PAF Hospital Mushaf.

MATERIALS AND METHODS:

Study Design: Descriptive cross-sectional

Study setting: Department of Medicine, PAF Hospital Mushaf Sargodha.

Duration of the study: The study was conducted from Dec 2025 to March 2026.

Sampling Technique:

Non-probability Consecutive sampling.

Sample size: The required sample size is 246 by using WHO sample size calculator. For this calculation frequency of hypertriglyceridemia is taken as 80%⁹. Margin of error for this calculation is 5% with 95% confidence interval.

Selection criteria:

Inclusion criteria:

- Patients with age range between 16 to 80 years.
- Patients admitted to PAF hospital Mushaf with ACS, including unstable angina, non-ST-segment elevation myocardial infarction (NSTEMI), or ST-segment elevation myocardial infarction (STEMI).

Exclusion criteria:

- Patients with a history of known familial hypertriglyceridemia or genetic lipid disorders.
- Patients receiving lipid-lowering medications (e.g., statins, fibrates) or undergoing lipid-lowering therapy.

Methods: In this study, a total of 246 patients meeting selection criteria, were included after taking informed consent, from department of medicine, PAF Hospital Mushaf, Sargodha. Consent was taken from patients or their attendants. Bio data like age, gender and contact details were taken from all subjects. Blood samples were collected from all patients using a 5 cc syringe. Fasting Lipid Profile levels was done, for all patients diagnosed with ACS. Patients were asked for history of familial hypertriglyceridemia, use of lipid-lowering drugs, family history of ACS, diabetes, hypertension and history of smoking. All data were collected directly by the researcher and recorded in the pre-designed proforma provided below. The SPSS version 25 was used to enter and analyze the gathered data.

RESULTS:

Among the 246 patients, the mean age was 54.49±12.43 years, with 134 (54.5%) males and 112 (45.5%) females. The majority of patients were aged 61–70 years (95, 38.6%), followed by 51–60 years (70, 28.5%), 41–50 years (33, 13.4%), 31–40 years (31, 12.6%), 20–30 years (14, 5.7%), and >70 years (3, 1.2%). The mean BMI was 26.80±3.42 kg/m², with 59 (24.0%) patients having normal BMI, 119 (48.4%) being overweight, and 68 (27.6%) being obese. The mean total cholesterol, triglycerides, HDL cholesterol, and LDL cholesterol levels were 199.6±42.4 mg/dL, 193.8±84.6 mg/dL, 39.8±8.5 mg/dL, and 122.3±35.8 mg/dL, respectively. Regarding educational level, 43 (17.5%) patients were illiterate, 68 (27.6%) had primary education, 37 (15.0%) had secondary education, 76 (30.9%) had high-level education, and 22 (8.9%) were graduates or above. Hypertension was present in 148 (60.2%) patients, diabetes mellitus in 107 (43.5%), a family history of acute coronary syndrome (ACS) in 88 (35.8%), and smoking in 90 (36.6%). Overall, hypertriglyceridemia was present in 175 (71.1%) patients, while 71 (28.9%) did not have hypertriglyceridemia (Table 1).

Table 1: Baseline Demographic and Clinical Characteristics (n=246)

Variables	
Age (Years)	54.49±S12.43
Gender	
Male	134(54.5%)
Female	112(45.5%)
Age Groups	
20-30 years	14(5.7%)

31-40 years	31(12.6%)
41-50 years	33(13.4%)
51-60 years	70(28.5%)
61-70 years	95(38.6%)
>70 years	3(1.2%)
BMI	26.80±3.42
BMI Categories	
Normal	59(24.0%)
Over weight	119(48.4%)
Obese	68(27.6%)
Lipid Profile	
Total Cholesterol	199.6±42.4
Triglycerides	193.8±84.6
HDL Cholesterol	39.8±8.5
LDL Cholesterol	122.3±35.8
Educational level	
Illiterate	43(17.5%)
Primary	68(27.6%)
Secondary	37(15.0%)
High	76(30.9%)
Graduate or Above	22(8.9%)
Hypertension	148(60.2%)
Diabetes Mellitus	107(43.5%)
Family history of ACS	88(35.8%)
Smoking	90(36.6%)
Hypertriglyceridemia	
Yes	175(71.1%)
No	71(28.9%)

The association between hypertriglyceridemia and selected demographic and clinical variables was assessed among 246 patients. Hypertriglyceridemia was more frequent among patients aged 61–70 years (68, 38.9%), followed by those aged 51–60 years (51, 29.1%), with no significant association between age group and hypertriglyceridemia ($p=0.68$). Similarly, no significant association was observed with gender ($p=0.92$), BMI category ($p=0.51$), educational level ($p=0.48$), hypertension ($p=0.10$), smoking status ($p=0.14$), or family history of ACS ($p=0.90$). Diabetes mellitus showed a borderline statistically significant association with hypertriglyceridemia ($p=0.05$), with diabetes present in 83 (47.4%) patients with hypertriglyceridemia compared with 24 (33.8%) patients without hypertriglyceridemia (Table 2).

Table 2: Stratification of Hypertriglyceridemia on the basis of Demographic and Clinical Characteristics (n=220)

Variables	Hypertriglyceridemia		P-Value
	YES	NO	
Age Groups			
20-30 years	8(4.6%)	6(8.5%)	0.68
31-40 years	20(11.4%)	11(15.5%)	
41-50 years	26(14.9%)	7(9.9%)	
51-60 years	51(29.1%)	19(26.8%)	
61-70 years	68(38.9%)	27(38.0%)	
>70 years	2(1.1%)	1(1.4%)	

Gender			
Male	95(54.3%)	39(54.9%)	0.92
Female	80(45.7%)	32(45.1%)	
BMI Categories			
Normal	45(25.7%)	14(19.7%)	0.51
Over weight	81(46.3%)	38(53.5%)	
Obese	49(28.0%)	19(26.8%)	
Educational level			
Illiterate	34(19.4%)	9(12.7%)	0.48
Primary	51(29.1%)	17(23.9%)	
Secondary	26(14.9%)	11(15.5%)	
High	50(28.6%)	26(36.6%)	
Graduate or Above	14(8.0%)	8(11.3%)	
Hypertension			
Yes	111(63.4%)	37(52.1%)	0.10
No	64(36.6%)	34(47.9%)	
Diabetes Mellitus			
Yes	83(47.4%)	24(33.8%)	0.05
No	92(52.6%)	47(66.2%)	
Smoking			
Yes	69(39.4%)	21(29.6%)	0.14
No	106(60.6%)	50(70.4%)	
Family history of ACS			
Yes	63(36.0%)	25(35.2%)	0.90
No	112(64.0%)	46(64.8%)	

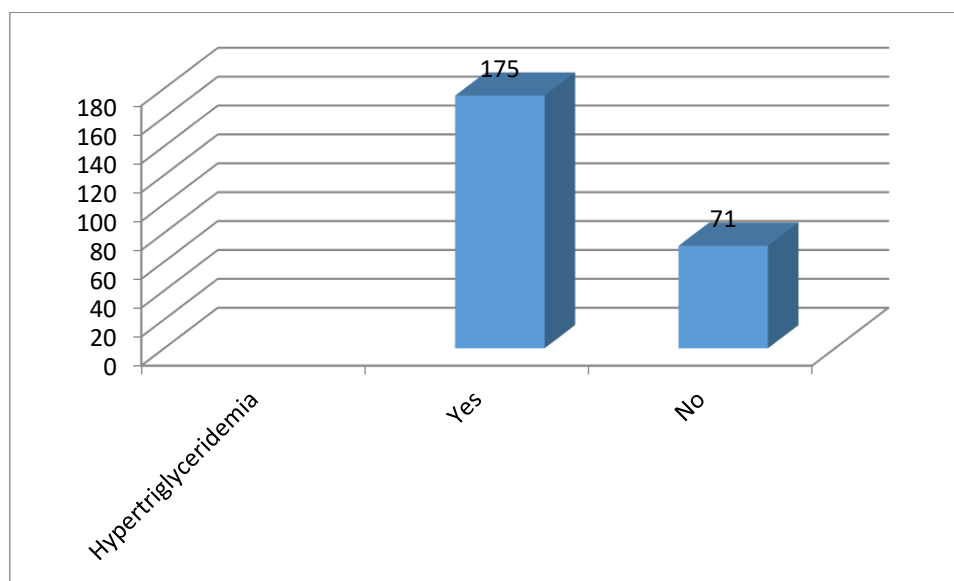


Fig 1: Frequency of patients on the basis of Hypertriglyceridemia

DISCUSSION:

The majority of patients with acute coronary syndrome (ACS) do not know what their lipid profile is. Early detection of dyslipidemia and timely beginning and suitable selection of cholesterol-lowering medication are made possible by early measurement of lipid levels, which may improve cardiovascular outcomes. The main objective of the present study was to determine the frequency of hypertriglyceridemia in patients presenting with Acute Coronary Syndrome. The finding of the present study stated that hypertriglyceridemia was present in 175 (71.1%) patients, while 71 (28.9%) did not have hypertriglyceridemia. Our study was supported by the study conducted by Malik MN et al.(11) found that 83.33% of patients with acute coronary syndrome (ACS) had hypertriglyceridemia. In another study by Chiara Tognola et al.(12) elevated triglyceride (TG) levels and hypertriglyceridemia were found to be substantially correlated with an increased risk of cardiovascular disease. Similarly, 80.1% of patients with acute coronary syndrome were found to have hypertriglyceridemia, according to González-Pacheco H et al.(13). This data supports the high frequency of hypertriglyceridemia in ACS

patients and is in line with our findings. According to the findings of another study,(14) hypertriglyceridemia is an independent predictor of unfavorable outcomes after acute myocardial infarction (AMI), with a greater impact shown in females. In female AMI patients, the study focused on targeted lipid-lowering treatment and routine triglyceride screening.

Our study shows that majority of patients were aged 61–70 years (95, 38.6%), followed by 51–60 years (70, 28.5%), 41–50 years (33, 13.4%), 31–40 years (31, 12.6%), 20–30 years (14, 5.7%), and >70 years (3, 1.2%). Our results aligned with those of prior research.(15) According to Adam AM et al.(16), the study participants' mean age was 60±8.71 years. Patients who report with acute coronary syndrome in these populations may have similar demographic traits and cardiovascular risk profiles, which could account for the same age distribution.

Age, sex, BMI, education level, hypertension, smoking status, and a positive family history of acute coronary syndrome (ACS) did not significantly correlate with hypertriglyceridemia in our study ($p > 0.05$). However, a marginally significant correlation ($p = 0.05$) was seen between hypertriglyceridemia and diabetes mellitus. Compared to 33.8% of patients without hypertriglyceridemia, 47.4% of patients with hypertriglyceridemia had diabetes. The strong metabolic connection between insulin resistance, poor glucose control, and high triglyceride levels may help to explain this. Hypertriglyceridemia is more prevalent in ACS patients, according to our research. Diabetes mellitus was marginally significantly related with hypertriglyceridemia, despite the fact that the majority of the clinical and demographic characteristics analyzed did not demonstrate a statistically significant association. Thus, early evaluation of lipid status, especially triglyceride levels, in ACS patients may help with better risk assessment and prompt commencement of suitable lipid-lowering treatment.

CONCLUSION:

It was concluded that hypertriglyceridemia was highly prevalent among patients with ACS. These findings highlight the importance of routine lipid profile assessment, particularly triglyceride measurement, in patients presenting with ACS to facilitate early identification of dyslipidemia, appropriate risk stratification, and timely initiation of lipid-lowering therapy.

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