

Frequency of Hypertriglyceridemia in Patients Presenting with Acute Coronary Syndrome in Local Population

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ABSTRACT

Objective: To determine the frequency of hypertriglyceridemia in acute coronary syndrome (ACS) patients in local population.

Study Design: Descriptive cross-sectional study

Place and Duration of Study: This study was conducted at the DHQ Teaching Hospital Bannu from January, 2019 to June, 2019 for a period of six months.

Materials and Methods: In this study, a total of 214 patients with acute coronary syndrome (ACS) were observed over a period of 6 months under informed written consent. They were interviewed through a pre-designed research proforma. ECG of the patients was done by Fukuda ME C110 machine present at ECG section and interpretation was done by myself. High sensitive troponin level for confirmation of ACS was measured in District Head Quarter Teaching Hospital (DHQ-TH), Bannu by ROCHE analyzer machine. The fasting serum triglyceride level was taken within 24 hours of admission with ACS. It was measured by ROCHE COBAS 501 chemical analyzer.

Results: In this study, mean age of the patients was 58 ± 12.33 , out of which 33% subjects fell in age group 51-60 years, 27% subjects were in age group 30-50 years, and 40% patients were in age group 61-70 years. About 45% subjects were female while 45% were male. The frequency of hypertriglyceridemia was 80% in patients with ACS.

Conclusion: Our study concludes that hypertriglyceridemia was frequently observed among patients presenting with acute coronary syndrome to the coronary care unit of DHQ-TH Bannu.

Key Words: Hypertriglyceridemia, Acute coronary syndrome, DHQ-TH

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INTRODUCTION

Coronary Artery disease (CAD) is an international health problem in both gender and also a leading cause of death in the developed countries⁽¹⁾. Acute coronary syndrome (ACS) refers to a spectrum of clinical presentations ranging from ST-segment elevation myocardial infarction (STEMI) to non-ST-segment elevation myocardial infarction (NSTEMI) or unstable angina.

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CAD being a cause of acute coronary syndrome; its prevalence is equally high in south Asia including Pakistan⁽²⁾.

According to reports, around 17 million people worldwide succumb to death due to coronary artery disease⁽³⁾. According to the World Health Organization (WHO) the main risk factor of acute coronary syndrome are hypertriglyceridemia, hypertension, cigarette use, hyperglycemia, lack of physical activity, overweight and obesity^(4, 5).

Hypertriglyceridemia is defined as raised levels of triglycerides in the bloodstream, a condition that increases the risk of CAD⁽⁶⁾. Hypertriglyceridemia is one of the risk factors for ACS⁽⁴⁾, characterized by increased levels of LDL cholesterol and decreased HDL cholesterol⁽⁷⁾. As per numerous studies, triglyceride-rich lipoproteins are an independent risk factor for acute coronary syndrome^(8,9). Pathophysiology behind this association include increased pro-inflammatory cytokines, excessive release of free fatty acids, coagulation factors, and deranged fibrinolysis⁽¹⁰⁾.

A large randomized controlled trial concluded that in patients with established CAD, twenty years mortality risk increases gradually with increasing triglyceride

levels so that it was increased by 68% with severe hypertriglyceridemia when compared with patients having low triglyceride levels⁽¹¹⁾. It was also demonstrated by PROVE-IT TIMI 22 trial that in patients with ACS with each 10mg/dl decrease in triglyceride level lead to lowering of incidence of death, myocardial infarction and recurrent ACS by 1.6%⁽¹²⁾. A study done in Mexico¹³ recorded that 50.1% of patients with ACS were suffering from hypertriglyceridemia. A recent study conducted in Pakistan reported that hypertriglyceridemia was present in 83.33% of ACS cases⁽¹⁴⁾.

The previously available studies show significant variation in the frequency of hypertriglyceridemia in ACS necessitating further research to know about actual frequency of hypertriglyceridemia in ACS in our population.

MATERIALS AND METHODS

The present study was conducted at coronary care unit of DHQ-TH Bannu over a period of six months from 1st January 2019 to 1st June 2019. Sample size was calculated using WHO sample size calculator with 95% confidence interval and 5% margin of error. Samples were collected using non probability, consecutive sampling technique. Patients included in the study were of either genders, aged 30-70 years and having ACS as per standard criteria.

Patients excluded from the study were those with Chronic kidney disease having serum creatinine >2.5mg/dl, those with other co-morbidities such as stroke, those denying written informed consent, and those with multi-organ dysfunction.

A total of 214 cases after fulfilling the inclusion and exclusion criteria were enrolled for study purpose from coronary care unit of DHQ-TH Bannu. An informed consent of the patients was obtained with the assurance of confidentiality of their medical records. A detailed history of the patients, their medical records, demographic profile e.g. age, gender, sex, monthly income, home address, and contact No's was obtained and recorded. ECG of the patients was done by Fukuda ME C110 machine present at ECG section followed by myself. High sensitive troponin level for confirmation of ACS was measured in Laboratory by ROCHE analyzer machine at DHQ-TH Bannu. The fasting serum triglyceride level was taken within 24 hours of admission with acute coronary syndrome. It was measured by ROCHE COBAS 501 chemical analyzer machine. Any patient having triglyceride levels >200mg/dl was labelled as having hypertriglyceridemia. All this information was recorded on Performa and analyzed using Microsoft Excel 2016 and SPSS version-16.

Mean \pm S.D were used to assess quantitative variables while Qualitative variables were assessed in the form of frequency and percentage. Data was stratified for

gender, age, and BMI (obese and non-obese). Chi-square test was applied after stratification. Statistically significant P value was considered as <0.05.

RESULTS

The Mean age of patients in this study was 58 ± 12.33 . About 33% (n, 71) patients were in the age range 51-60 years, 27% (n, 58) patients were in age range 30-50 years, and 40% (n, 85) patients were in age range 61-70 years. (Table 03). About 45% (n, 96) patients were female while 55% (n, 118) patients were male. Status of obesity was analyzed 38% (n, 81) patients were non obese (BMI <30 Kg/m² while 62% (n,133) patients were obese (BMI >30 Kg/m² (Table No 01). Hypertriglyceridemia was analyzed as 80% (n, 171) patients had hypertriglyceridemia (Table No 02). Stratification of hypertriglyceridemia with age, gender, BMI is given in Table 3, 04 and 05.

Table No.1: BMI (n=214)

BMI	Frequency	Percent
Non obese ≤ 30 kg/m ²	81	38%
Obese >30 kg/m ²	133	62%
Total	214	100%

Mean BMI was 27 kg/m² with SD \pm 3.09

Mean height was 1.3 meters with SD \pm 0.95

Mean weight was 88 Kg with SD \pm 10.71

Mean triglycerides was 242g/dL with SD \pm 28.374

Table No.2: Hypertriglyceridemia (n=214)

Hypertriglyceridemia	Frequency	Percent
Yes	171	80%
No	43	20%
Total	214	100%

Table No.3: Age Wise Distribution of Hypertriglyceridemia (n=214)

Hypertriglyceridemia	31-50 years	51-60 years	61-70 years	Total
Yes	46	56	69	171
No	12	15	16	43
Total	58	71	85	214
%age within age gap	27%	33%	40%	100%

Chi square test was applied in which P value was 0.9299

Table No.4: Stratification of Hypertriglyceridemia Within Gender (n=214)

Hypertriglyceridemia	Male	Female	Total
YES	94	77	171
NO	24	19	43
Total	118	96	214

P value: 0.9936

Table No.5: Hypertriglyceridemia Association with Obesity (n= 214)

Hypertriglyceridemia	Obese	Non obese	Total
YES	65	106	171
NO	16	27	43
Total	81	133	214

P value: 0.9014

DISCUSSION

Majority of Patients presented with acute coronary syndrome usually do not usually do not have any information regarding their lipid profile. The early knowledge of lipid status of patients with an ACS might allow an early classification of eventual dyslipidemia and will be helpful in selection of lipid lowering therapy. In this study we used diagnostic criteria for ACS following American Heart Association of Cardiology guidelines.¹⁵

We observed that the Mean age of patient in the present study was ± 12.33 , with slight male dominate [male, 55%] disease as compared to female patients [female, 45%]. This is in consistent with other studies from the region.¹⁶ Adam AM et al¹⁷ had reported mean age of 60 ± 8.71 years. About 38% patients were female whereas 62% subjects were male.

Our study shows that majority of 40% patients were in age range 61-70 years. This has been proved by previous research that advancing age is a risk factor for CAD and myocardial infarction.^{17, 18}

We determine that frequency of hypertriglyceridemia was 80% among patients presenting with acute coronary syndrome and gender has no significant effect [P value, 0.9936] on it.

Malik MN et al¹⁴, revealed hypertriglyceridemia in 83.33% patients with ACS and raised LDL in 43.30% subjects. Low HDL value was noted in 73.20% ACS patients. P value was not significant (P-value > 0.05) among male and female subjects in terms of comparison for level of dyslipidemia in both genders.

González-Pacheco H et al¹³ reported similar frequency of Hypertriglyceridemia about 80.1% in patients with ACS.

We also observed that obesity has no significant effect on hypertriglyceridemia. This is also shown by Lee SY et al that moderate intensity Hypertriglyceridemia in Non-Obese and Non-Diabetic Subjects found due to Altered Plasma Lysophosphatidylcholines and Amides.¹⁹ According to all results this discussion can be concluded that hypertriglyceridemia is a polygenic and environmentally determined metabolic disease that affects the production and clearance of triglyceride (TG)-rich lipoproteins.²⁰ An elevated level of plasma TG is an independent risk factor for type 2 diabetes (T2D), metabolic syndrome, and atherosclerotic cardiovascular disease (CVD).²¹

So timely admission of ACS patients is beneficial and important for the evaluation of the lipid profile so that most suitable treatment can be chosen for better prognosis.

CONCLUSION

Hypertriglyceridemia is frequently present among patients presenting with acute coronary syndrome in local population.

Author's Contribution:

Concept & Design of Study:	Atif ur Rahman
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Conflict of Interest: The study has no conflict of interest to declare by any author.

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