https://doi.org/10.29309/TPMJ/2023.30.11.7815

The Professional Medical Journal
www.theprofesional.com
2023, Volume, 30 Issue, 11

ORIGINAL ARTICLE

Frequency of hyperlipidemia in patients of acute pancreatitis; An institutional experience.

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Article Citation: Khan AA, Siddiqui MZ, Athar S, Mushtaq M, Manan A, Arshad MW. Frequency of hyperlipidemia in patients of acute pancreatitis; An institutional experience. Professional Med J 2023; 30(11):1404-1409. https://doi.org/10.29309/TPMJ/2023.30.11.7815

ABSTRACT… Objective: To determine the frequency of hyperlipidemia in patients of acute pancreatitis. **Study Design:** Descriptive Cross-sectional study. **Setting:** Department of Surgery, Nishtar Medical University, Multan. **Period:** 1st October 2021 to 31st March 2023. **Material & Methods:** Total 139 patients diagnosed as acute pancreatitis were included. Data regarding baseline patient variables such as age, gender, BMI and duration of acute pancreatitis symptoms were noted. Date analysis was done by using SPSS version 23 software. **Results:** Mean age of 38.55 ± 10.82 years was found in the study. Regarding body mass index (BMI) of patients, mean was 24.91 ± 3.32 kg/m^2. There were 87 (62.59%) males and 52 (37.41%) female patients. Thirty-three (23.74%) out of 139 patients were smokers. Mean duration of symptoms was 3.73 ± 2.03 days. Hyperlipidemia was found in 52 (37.41%) patients. **Conclusion:** Hyperlipidemia was present in more than one third of patients presented as acute pancreatitis. It may be a sole cause or epiphenomenon of pancreatitis. It should be taken as isolated and coexisting factors in diagnosis and treatment.

Key words: Acute Pancreatitis, Frequency and Hyperlipidemia.

INTRODUCTION

Acute pancreatitis (AP) is a common surgical condition requiring admission.[1] Non-biliary causes are usually missed and result in recurrent attacks and repeated admissions [2,3] which result in high morbidity and mortality. Hyperlipidemia (HPL) is the third leading cause[4] of acute pancreatitis after gallstones and alcoholism. Reported incidence of hyperlipidemic pancreatitis is 10%.[5] Majority of acute pancreatitis cases are either mild or moderate, only 15-20% are severe[6,7] with mortality rate of 20-30%.[8] There are many challenges in the hyperlipidemic pancreatitis like difficulty in diagnosis, severity and high rate of recurrence. Locally there is a knowledge gap in this regard. Clinicians are not aware of this category of acute pancreatitis. No local data regarding frequency of hyperlipidemic pancreatitis, its severity, recurrence and treatment protocol present.

Hu X and Gong L mentioned that in 1865, Speck presented the relation between hyperlipidemia and acute pancreatitis[1] for the first time but exact mechanism is still unclear. Hyperlipidemia can be a hyponym to acute pancreatitis because lipid abnormalities are usually present in patients with alcoholism, diabetes, pregnancy and obesity.[5,9] Many studies mentioned hypertriglyceridemia (HTG) > 1000 mg/dl (11.3 mmol/L) as a sole cause of acute severe pancreatitis.[10,11] HTG level between 500-1000 mg/dl or even low level can cause acute pancreatitis at their own or act as contributing factor to cause pancreatitis. Although the precise mechanism of hyperlipidemic pancreatitis is not fully understood. Excess of free fatty acids (FFAs) and chylomicrons[12] increase the plasma viscosity, which leads to ischemia and inflammation of pancreatic tissue. Alcohol intake increases serum triglyceride levels in patients with underlying HTG which leads to AP. Hyper triglyceridemic pancreatitis (HTGP) may occur during pregnancy due to hormonal changes

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Article received on: 19/07/2023
Accepted for publication: 26/09/2023

and excess of these hormones increase serum cholesterol and triglycerides resulting in severe complications in mother and fetus.[5,9] Incidence of acute pancreatitis in patients having severe HTG (>1000mg/dl) was reported to be 20% in one retrospective study.[5] Another study showed that each 100mg/dl rise in triglyceride level increased the risk of AP by 4%.[11]

Existing literature have reported varying frequency of HLP in patients of acute pancreatitis. A study conducted in Saudi Arabia by Alamoodi et al found only 10% frequency of HLP in acute pancreatitis patients.[13] Radojkovic et al conducted a study in Serbia and found 51% frequency of HLP in acute pancreatitis patients.[14] Reported variability in existing literature may be because of difference in reference level of Triglyceride and patient factors like eating habits and life style. No local data available in this regard. Objective of this study is to determine the frequency of HLP in patients of acute pancreatitis. Results of the study will provide the frequency, severity and risk factors of hyperlipidemic pancreatitis in our setup and to develop local treatment guidelines. This will help to avoid recurrence and pancreatitis related morbidity and mortality.

OBJECTIVE

To determine the frequency of hyperlipidemia in patients of acute pancreatitis.

MATERIAL & METHODS

This descriptive cross-sectional study was conducted in department of Surgery, Nishtar Hospital Multan from 01-10-2021 to 31-03-2023. Sampling Technique was non-probability, consecutive sampling. All the patients having age 20-60 years, irrespective of gender admitted with diagnosis of acute pancreatitis and duration of symptoms <1 week were included in this study. Patients taking lipid lowering drugs or hormonal treatment which can affect the results of lipid profile were excluded from the study (2547/25-08-21).

A written informed consent was taken from all patients. Data regarding baseline patient variables such as age, gender, BMI, duration of symptoms and results of lipid profiles test were noted on a predesigned Proforma. Date analysis was carried out using SPSS version 23 Software. Mean and Standard deviation were calculated for above variables. Frequency for smoking history and HLP was also calculated. Data was stratified on age, gender, BMI, smoking history, and duration of acute pancreatitis symptoms. Post-stratification Chi-square test was applied. P-value <0.05 was considered as significant difference. Approval from Ethical Review Board of Nishtar Medical University was taken before start of study.

RESULTS

Out of total 139 patients, 87 (62.59%) were males and 52 (37.41%) were female. Mean age of 38.55 ± 10.82 years was found in the study. Mean height and weight of patients was 163.18 ± 9.95 cm (Range 143 to 190 cm) and 66.41 ± 10.77 Kg (Range 45 to 90 Kg) respectively. Regarding body mass index (BMI) of patients, mean was 24.91 ± 3.32 kg/m^2. Thirty-three (23.74%) out of 139 patients were smokers. Mean duration of symptoms was 3.73 ± 2.03 days. Hyperlipidemia was found in 52 (37.41%) patients.

Stratification of age and gender was performed and no significant association was found between these variables and hyperlipidemia. Hyperlipidemia was found in 24 patients of 20-36 years age group and in 28 of 37-60 years age group with p-value of 0.984. Thirty-four males and 18 females were found to be hyperlipidemic with p-value of 0.599. Stratification was also performed on the basis of BMI, smoking and duration of symptoms. No association was found between these variables and hyperlipidemia.

DISCUSSION

Hyperlipidemia is closely related to acute pancreatitis, either as a sole cause or as an epiphenomenon. Out of total 139 patients, 87 (62.59%) were males and 52 (37.41%) were female in ours study.

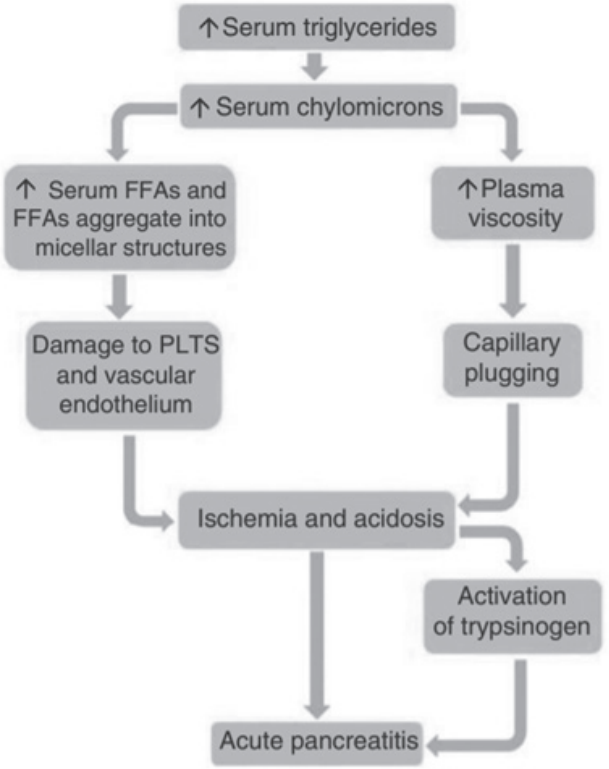

Figure-1. Pathophysiology of hyperlipidemic pancreatitis

Variables		Hyperlipidemia		P-Value
		Yes	No	
Age	20-36Y	24	40	0.984
	37-60Y	28	47	
Gender	Male	34	53	0.599
	Female	18	34	
BMI	≤ 24.99	26	48	0.554
	≥ 25	26	39	
Smoking	Yes	09	24	0.168
	No	43	63	
Duration of symptoms	1-3 day	31	41	0.154
	4-7 day	21	46	

Table-I. Association between different variables & hyperlipidemia (n=139)

Rehan A et al from Faisalabad, Pakistan mentioned 47 (39.2%)male and 73(60.08%) female in his study[15] while Shabbir S et al from Islamabad, Pakistan mentioned 35(44%) males and 45(56%) females in his study.[16] In ours study, mean age was 38.55 ± 10.82 years (Range 20 to 60 years) while Rehan A mentioned mean age 39.03 ± 8.71 years (Range 23 to 56 years).[15]

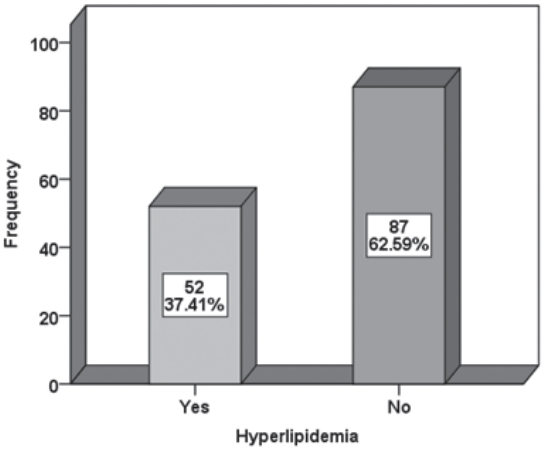

Figure-2. Frequency of hyperlipidemia in acute pancreatitis (n=139)

Shabbir S from Islamabad mentioned mean age of 46.89 ± 15.75 years.[16] Hyperlipidemia was found in 52 (37.41%) patients in ours study. Stratification of age and gender was performed and no significant association was found between these variables and hyperlipidemia. Hyperlipidemia was found in 24 patients of 20-36 years age group and in 28 of 37-60 years age group with p-value of 0.984. Thirty-four males and 18 females were found to be hyperlipidemic with p-value of 0.599. Stratification was also performed on the basis of BMI, smoking and duration of symptoms. No association was found between these variables and hyperlipidemia.

In present study, hyperlipidemia was diagnosed in 37.4% patients of acute pancreatitis. A study conducted in Saudi Arabia by Alamoodi et al found only 10% frequency of HLP in acute pancreatitis patients.[13] Radojkovic et al. conducted a study in Serbia and found 51% frequency of HLP in acute pancreatitis patients.[14] Studies conducted by Hernandez P[5] et al and Beyer G et al[17] found 10% frequency of HLP in acute pancreatitis patients.

Exact mechanism of hyperlipidemic pancreatitis is still unclear but free fatty acids and chylomicrons increase the viscosity of blood, which in turn causes ischemia and necrosis of pancreatic tissue. Pregnancy, male sex, alcoholism and medical conditions such as diabetes precipitate hypertriglyceridemia to cause pancreatitis. In

alcoholic pancreatitis, pancreatic damage is again due to hyperlipidemia. Tang Q tried to establish association between COVID-19, hyperlipidemia and acute pancreatitis.[18]

There are many challenges in the hyperlipidemic pancreatitis like difficulty in diagnosis, severity and high rate of recurrence. Symptoms are usually not typical, amylase may be normal due to high serum concentration of triglycerides and difficulty in interpretation of ultrasound findings in obese patients.[10] Zhang R et al mentioned in his study that severe hypertriglyceridemia (HTG= 11.3 mmol/L or 1000mg/dl) leads to severe acute pancreatitis.[19] Common findings in these patients were that they were male, having diabetes, fatty liver, deranged lipid profile and worse disease. Szatmary P mentioned that mild HTG (1.7 to 5.6 mmol/L or 150-500 mg/dl) and moderate HTG (5.6-11.3 mmol/dl or 500-1000 mg/dl) cause less severe pancreatitis.[11] Different scoring systems were used to predict the severity of pancreatitis and outcome of the patient. Shabbir S et al from Islamabad mentioned that BISAP score is equally effective as Ranson's score.[16] Rehan A described CT severity index (CTSCI) and modified CT severity index (MCTSI) to judge the severity of acute pancreatitis radiologically.[15] Later one incorporate extra pancreatic complication also and have sensitivity, specificity and positive predictive value of 71%, 93% and 69% respectively. Revised Altlanta classification is very simple and useful to divide the patients in to mild, moderate and severe acute pancreatitis category.[20,21] In mild cases, there is no local complications or organ failure. In moderate AP, there is transient organ failure (< 48 hours) or local complications. In severe form there is persistent organ failure (> 48 hours). Recurrent pancreatitis is another problem while dealing with hyperlipidemic pancreatitis. Song k et al[2] report recurrence rate of 16.7%, Mallick B et al[3] report 12.7% after 08 year follow up and one report from Japan showed 19% in 35 year follow up. Three common factors diabetes, male sex and hyperlipidemia were present in recurrent cases. Young X et al reported that 20% of post hyperlipidemic pancreatitis patient develop diabetes within 03 years.[21] Treatment of hyperlipidemic pancreatitis is again a challenge. It may be divided in to invasive and noninvasive treatment. Noninvasive treatment includes Antilipid agents like heparin, low molecular weight heparin and insulin.[4] Invasive treatment is required for resistant cases and for severe hyperlipidemia > 1000 mg/dl. Invasive treatment includes Hemoperfusion, Plasmapheresis and continuous renal replacement therapy.[12] Gad MM et al mention that aggressive intravenous fluid therapy is harmful and can cause acute kidney injury, pulmonary edema and respiratory failure.[6] James TW et al mentioned in his study that early oral fluid is beneficial and it decreases the risk of infective necrosis.[22]

Our study provided the data regarding frequency of hyperlipidemia as a cause of acute pancreatitis. This data will compel the clinicians to do routine lipid profile test in all pancreatitis patient and to consider hyperlipidemic pancreatitis as a separate identity. It will help to develop local treatment protocol and stimulate for further research. Study has few limitations like it is single centered and has small sample size.

CONCLUSION

Hyperlipidemia was present in more than one third of patients presenting as acute pancreatitis. It may be a sole cause or epiphenomenon of pancreatitis. It should be taken as isolated and difficult problem in diagnosis and treatment.

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2	M. Zubair Siddiqui	Data analysis, Study design, Interpretation.	
3	Saim Athar	Data analysis, Study design, Interpretation.	
4	Muhammad Mushtaq	Conception, Data collection analysis.	
5	Abdul Manan	Conception and design of the study and data collection.	
6	M. Waqas Arshad	Data collection and analysis, Final reading.