Int. j. adv. multidisc. res. stud. 2023; 3(3):154-156

Received: 21-03-2023
Accepted: 01-05-2023

International Journal of Advanced Multidisciplinary Research and Studies

ISSN: 2583-049X

Frequency of Deranged Lipid Profile in Patients of Acute Pancreatitis

[1] Dr. Aamir Khan, [2] Dr. Ubaid Ullah, [3] Dr. Muhammad Naeem Khattak, [4] Dr. Amir Hamza Khan, [5] Dr. Haroon Ahmad Khan, [6] Dr. Anam Amin, [7] Dr. Sundas Rehman

[1, 2, 4, 5, 7] Post Graduate Resident, Department of Surgery, Khyber Teaching Hospital, Peshawar, Pakistan
[3] Associate Professor, Department of Surgery, Khyber Teaching Hospital, Peshawar, Pakistan
[6] Post Graduate Resident, Department of Medicine, North West General Hospital, Peshawar, Pakistan

Corresponding Author: **Dr. Muhammad Naeem Khattak**

Abstract

Objectives:
To determine the frequency of deranged lipid profile in patients of acute pancreatitis.

Study Design:
Descriptive Cross-sectional study

Setting:
Department of Surgery, Khyber Teaching Hospital, Peshawar.

Duration:
From January 2023 to May 2023.

Methodology:
After attaining approval from the Hospital ethical committee, 100 diagnosed Patients of acute pancreatitis of all ages irrespective of the gender were included in the study taking into account specifically the lipid profile, Glasgow score, age, gender, residence of the patient and educational status of the patients. The data was compiled on a proforma, and SPSS v23 was used to analyse it. The technique utilised was non-probability consecutive sampling. In this study, the categorical variables were described in terms of frequency and percentages; on the other hand, continuous variables were showed in mean and standard deviations.

Results:
55 (55%) of the 100 patients that were enrolled in this study were male, and 45% were female. The average age was 30.5 years +/- SD, ranging from 21 to 70 years. With regard to LDL levels, 48 patients had deranged LDL levels, 51 patients had deranged serum triglycerides levels and for HDL levels there was no significant derangement seen. The overall frequency of deranged lipid profile in patients with acute pancreatitis is 51.2%. Considering the Glasgow scoring which is used to determine the severity of acute pancreatitis, out of the total 100 patients about 20 presented with zero score, 45 presented with 1 score,30 with 2 score and only 8 patients presented with 3 Glasgow score.

Conclusion:
Taking the overall frequency of deranged lipid profile in patients with acute pancreatitis as 51.2%. We can safely conclude that hyperlipidemia is frequent in patients of acute pancreatitis and can be a considerable cause in many cases where other causes are ruled out.

Keywords: LDL, HDL, Triglycerides, Acute Pancreatitis

Introduction

An acute inflammation of the pancreas is known as acute pancreatitis (AP) and is characterised by severe abdominal pain and increased pancreatic enzyme levels. The prevalence of AP has considerably increased in recent decades, and it is currently one of the major factors contributing to gastrointestinal-related hospitalization [1, 2].

The main contributing factors to AP are still gallstones and persistent alcohol intake. The third most typical cause is hypertriglyceridemia. Although it has been shown that up to 22% of people have hypertriglyceridemia-induced pancreatitis (HTGP), it is typically believed to be responsible for up to 56% of all AP cases and 5% of all AP cases during pregnancy [4, 5, 6, 7, 8].

Fasting blood triglyceride concentrations greater than 150 mg/dL (1.7 mmol/L) are referred to as hypertriglyceridemia (HTG). Although the risk steadily increases as triglyceride levels rise, the precise level at which HTG causes AP is unknown. Generally, a triglyceride level over 1000 mg/dL is required; the risk is approximately 5% with levels over 1000 mg/dL and increases to 10-20% with levels over 2000 mg/dL [4]. The majority of the information regarding the occurrence of HTGP in patients with very severe HTG comes from retrospective studies. In a study with 129 people who had severe HTG (triglycerides > 1000 mg/mL), 20.2% of patients had a history of AP, and those with AP had significantly higher mean

triglyceride levels than those without AP [9]. In a separate study of 300 patients with at least one triglyceride level > 1000 mg/dL, a history of pancreatitis was reported by 8% of patients, and a diagnosis of pancreatitis was discovered in 4% of patients. More than two-thirds of pancreatitis patients had triglyceride levels above 2411 mg/dL, and 25% had levels between 1415 and 2411 mg/dL [10]. The mean triglyceride level in patients with HTGP in a comprehensive analysis of 1130 patients was 3467 mg/dL [11].

Therefore, the goal of this study is to evaluate the prevalence of hyperlipidemias in cases of acute pancreatitis so that it may assess whether or not this metabolic abnormality is a risk factor for developing acute pancreatitis.

Materials and Methods

A tertiary care hospital in Peshawar served as the setting for this descriptive cross-sectional study from January 2023 to May 2023. After attaining approval from the Hospital ethical committee all diagnosed Patients of acute pancreatitis of all ages irrespective of the gender were included in the study. Patients were admitted either through OPD or emergency. Patients were properly investigated through the guidelines of acute pancreatitis and confirmed diagnosis were made. In our study we took into account specifically the lipid profile, Glasgow score, age, gender, residence of the patient and educational status of the patients. Informed consents were taken from patients. They were explained about study and the possible outcome and ultimate benefit of the study. The data was collected on a proforma and was analyzed using SPSS 23 software. A sample size of 100 patients was calculated using the WHO sample size formula and calculator, keeping 14% of population proportion, margin error of 7% with a 95% confidence interval. It was done using a non-probability consecutive sampling technique. The categorical variables were described in terms of frequency and percentages; on the other hand, continuous variables were showed in mean and standard deviations.

Results

100 patients were included in the study. Out of the total, 55(55%) were males and (45%) were females. The median age was 30.5 years, with ages ranging from 21 to 70 years. Majority were in fourth and fifth decade of life. Out of these about 55(55%) patients were from urban areas and 45(45%) were from rural areas. Also, about 51% of the total were educated and rest of the 49 patients were non-educated. With regard to LDL levels 48 patients, out of the total 100 were in the normal range (48%) and the rest of the 52% patients have deranged LDL levels. Out of the deranged 48% were in the range of (151 to 180 mg/dl) and about 4% were in the range of (181 to 200 mg/dl) which is severe derangement of LDL profile (Table 1). Similarly, regarding Triglycerides about 45 patients were in the normal range and 51 patients have deranged serum triglycerides levels. Out of these 51 patients 37 patients have mild derangement of 201 to 220 mg/dl and 14% have severe derangement and lies in the range of 221 to 230 mg/dl (Table 2). Similarly looking into the results of HDL there is no significant derangement serum HDL levels. Almost all patients fall in the normal range except 3 patients which fall below normal range (Table 3). If we consider mean percentages of the patients with deranged LDL and HDL, it came out to be 51.2%. This means that overall frequency of deranged lipid profile in patients diagnosed with acute pancreatitis is 51.2%.

Considering the Glasgow scoring which is used to determine the severity of acute pancreatitis, out of the total 100 patients about 20 presented with zero score, 45 presented with 1 score,30 with 2 score and only 8 patients presented with 3 Glasgow score. Usually, 1 to 3 Glasgow score is in mild acute pancreatitis. So, we can say that Acute Pancreatitis induced by deranged lipid profile is usually of mild severity.

Table 1: LDL Status

LDL Groups	Frequency/percentages
121 to 150	48(48%)
151 to 180	48(48%)
181 to 190	4(4%)
Total	100(100%)

Table 2: Triglycerides

Triglycerides Groups	Frequency/Percentages
181 to 200	49(49%)
201 to 220	37(37%)
221 to 230	14(14%)
Total	100(100%)

Table 3: HDL Groups

HDL groups	Frequency/Percentages
30 to 40	79(79%)
41 to 50	19(19%)
51 to 61	2(2%)
Total	100(100%)

Discussion

Hypertriglyceridemia is third among the most frequent causes of acute pancreatitis (AP). Early diagnosis of HTGP is essential for effective treatment and prevention of recurrence. For this purpose, we conducted a Descriptive cross-sectional study in our ward to know the frequency of deranged lipid profile in patients with acute pancreatitis. we included about 100 diagnosed patients of acute pancreatitis in our study. Lipid profile including HDL, LDL and Triglycerides were done for each patient and were analyzed. Overall, about 51.2% of patients were found to have deranged lipid profile. In comparison to the previous studies done on the problem concerned, our result is a bit higher in percentage.

Intriguingly, a recent epidemiology study from China that evaluated 108 (22.7%) of the 475 patients with moderately severe/severe AP had HTGP (triglycerides > 1000 mg/dL), and the annual admission rate for HTGP climbed consistently from 14.3% to 35.5% throughout the course of the study, showing a 16-year trend. According to theories, the growing HTGP trend in China is caused by the population's evolving lifestyle and behaviors, the increasing prevalence of metabolic syndrome and the increase intake of calories [12].

Patients with HTG and AP have distinct demographic disparities from those with AP from other causes. In a prospective analysis of 400 AP patients, those with HTG were more likely to be of younger age, male, overweight, and have higher rates of diabetes. Individuals with AP were younger both at the time of admission and the HTG diagnosis, as was also shown in Linares *et al*.'s investigation

of 129 patients with severe HTG [9]. In a recent retrospective case-control study of 124 individuals with severe hypertriglyceridemia, of whom 62 developed HTGP, it was found that younger age and a history of diabetes were independent risk factors for HTGP in this population [14]. Activation of the inflammatory response and accumulation of free fatty acids (FFA) are linked to the pathophysiology of HTGP, according to literature [15, 16]. The precise pathophysiology of HTGP is mostly understood through the use of animal models [18]. Vascular endothelial cells as well as acinar cells are directly affected by FFA, as they produce a cytotoxic effect [19, 20].

Pancreatic microcirculation disturbances also contribute to the development of HTGP. HTG causes the vasoconstrictor thromboxane A2 to be released in significant amounts and the vasodilator prostaglandin 2 to be secreted less frequently. This mismatch causes the pancreatic microcirculation to worsen and capillary beds to contract excessively [21, 22].

Overall, we can say that deranged lipid profile has definite association with acute pancreatitis. In our study it is about 52% which can be further improved by improving the sample size and laboratory investigations for determining the serum lipid profile. There is no local study available for comparison and single center research is the limitation of our study.

Conclusion

Taking the overall frequency of deranged lipid profile in patients with acute pancreatitis as 51.2%. We can safely conclude that hyperlipidemia is frequent in patients of acute pancreatitis and can be a considerable cause in many cases where other causes are ruled out.

References

1. Peery AF, *et al*. Burden of Gastrointestinal, Liver, and Pancreatic Diseases in the United States. Gastroenterology. 2015; 149(7):1731-1741 e3.
2. Yadav D, Lowenfels AB. Trends in the epidemiology of the first attack of acute pancreatitis: A systematic review. Pancreas. 2006; 33(4):323-330.
3. Chang CC, *et al*. Acute pancreatitis in pregnancy. Zhonghua Yi Xue Za Zhi (Taipei). 1998; 61(2):85-92.
4. Scherer J. *et al*. Issues in hypertriglyceridemic pancreatitis: An update. J Clin Gastroenterol. 2014; 48(3):195-203.
5. Papachristou GI, *et al*. Acute pancreatitis patient registry to examine novel therapies in clinical experience (APPRENTICE): An international, multicenter consortium for the study of acute pancreatitis. Ann Gastroenterol. 2017; 30(1):106-113.
6. Zhu Y, *et al*. A Study on the Etiology, Severity, and Mortality of 3260 Patients with Acute Pancreatitis According to the Revised Atlanta Classification in Jiangxi, China Over an 8-Year Period. Pancreas. 2017; 46(4):504-509.
7. Jin M, *et al*. A 16-year trend of etiology in acute pancreatitis: The increasing proportion of hypertriglyceridemia-associated acute pancreatitis and its adverse effect on prognosis. J Clin Lipidol, 2019.
8. Berglund L, *et al*. Evaluation and treatment of hypertriglyceridemia: An Endocrine Society clinical practice guideline. J Clin Endocrinol Metab. 2012; 97(9):2969-2989.
9. Lloret Linares C, *et al*. Acute pancreatitis in a cohort of 129 patients referred for severe hypertriglyceridemia. Pancreas. 2008; 37(1):13-22.
10. Bessembinders K, Wielders J, van de Wiel A. Severe hypertriglyceridemia influenced by alcohol (SHIBA). Alcohol Alcohol. 2011; 46(2):113-116.
11. Carr RA, *et al*. Systematic review of hypertriglyceridemia-induced acute pancreatitis: A more virulent etiology? Pancreatology. 2016; 16(4):469-476.
12. Jin M, *et al*. A 16-year trend of etiology in acute pancreatitis: The increasing proportion of hypertriglyceridemia-associated acute pancreatitis and its adverse effect on prognosis. J Clin Lipidol. 2019; 13(6):947-953 e1.
13. Nawaz H, *et al*. Elevated serum triglycerides are independently associated with persistent organ failure in acute pancreatitis. Am J Gastroenterol. 2015; 110(10):1497-1503.
14. Li Q, *et al*. Diabetes and Younger Age Are Vital and Independent Risk Factors for Acute Pancreatitis in Patients with Severe Hypertriglyceridemia. Biomed Res Int, 2019, p. 2620750.
15. Fredrickson DS. An international classification of hyperlipidemias and hyperlipoproteinemias. Ann Intern Med. 1971; 75(3):471-472.
16. Yuan G, Al-Shali KZ, Hegele RA. Hypertriglyceridemia: Its etiology, effects and treatment. CMAJ. 2007; 176(8):1113-1120.
17. Hsia SH, Connelly PW, Hegele RA. Successful outcome in severe pregnancy-associated hyperlipemia: A case report and literature review. Am J Med Sci. 1995; 309(4):213-218.
18. Toskes PP. Hyperlipidemic pancreatitis. Gastroenterol Clin North Am. 1990; 19(4):783-791.
19. Whitfield JB, *et al*. Some laboratory correlates of drinking habits. Ann Clin Biochem. 1978; 15(6):297-303.
20. Elkhouly MA, Salazar MJ, Simons-Linares CR. Hypertriglyceridemia-Associated DrugInduced Acute Pancreatitis. Pancreas. 2019; 48(1):22-35.
21. Valdivielso P, Ramirez-Bueno A, Ewald N. Current knowledge of hypertriglyceridemic pancreatitis. Eur J Intern Med. 2014; 25(8):689-694.
22. Chang YT, *et al*. Association of cystic fibrosis transmembrane conductance regulator (CFTR) mutation/variant/haplotype and tumor necrosis factor (TNF) promoter polymorphism in hyperlipidemic pancreatitis. Clin Chem. 2008; 54(1):131-138.