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Original Article

Evaluation of Risk Factors of Acute Pancreatitis among Young Adults in a Tertiary Care Hospital

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Abstract

Background: Acute pancreatitis (AP) is a common gastrointestinal emergency worldwide requiring hospitalization, with an increasing burden on patients and society. Gallstones/sludge and alcohol consumption are the leading causes, while other factors include abdominal trauma, post-ERCP, surgeries, metabolic disorders, hypertriglyceridemia, infections, and certain medications. The aim of the study was to explore the risk factors of acute pancreatitis among young adults.

Methods: A Prospective Observational study in tertiary level hospital. Sample was selected from the population by purposive sampling technique. Sample size was 100. Detail demographic data were collected from the subject and recorded in structured case report form. Clinical examination and relevant investigation were done meticulously. All the information recorded in data collection sheet. All collected questionnaire checked very carefully to identify the error in the data. Data processing work was consisted of registration schedules, editing computerization, preparation of dummy table, analyzing and matching of data. Data was processed and analysed with the help of computer program SPSS and Microsoft excel.

Result: Present study demonstrates that maximum number of patients (43.0%) were between 31-35 years age group, mean age of the patient was 36.9 ± 6.7 years. Out of 100 cases 78% were male and 22% were female. Male and female ratio was 3.54:1. In this study physical inactivity had predisposing factor, noted in 39% subjects, followed by sedentary habit in 21% subjects. In this study it was found that 78% of patients were smoker, H/O Gallstone disease were 8 patients, and only 12 patients had history of instrumentation. Drinking alcohol was reported in 5%, all of them were males. H/O diabetes mellitus were in 19.0% subject and dyslipidemia detected in 24.0% patients. Present study demonstrated that, prevalence of obesity is 46.0% patients.

Conclusion: The present study showed that sedentary lifestyle, obesity, alcohol, and tobacco are key risk factors for acute pancreatitis among young adults. Helps guide appropriate management and prevent recurrence.

Keywords: Acute pancreatitis, Risk factors, Young adults, Tertiary care hospital, Obesity, Smoking, Gallstone disease, Lifestyle factors.

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Introduction

Acute pancreatitis (AP) is an inflammatory condition of the pancreas, typically triggered by factors such as gallstones or excessive alcohol intake rather than infections.[1] Acute, recurrent, and chronic pancreatitis are now viewed as a disease continuum, with about 30% of acute cases progressing to chronic forms.[2] Gallstones, including microlithiasis, are the most common cause of AP, although only a small proportion of patients with gallstones develop pancreatitis. Risk

factors include female sex, older age, and small stones. Obesity, sedentary lifestyle, and dietary habits also contribute to disease development, particularly in younger populations.[3]

Other causes of AP include biliary sludge, pancreatic and periampullary tumors, anatomical variations such as pancreas divisum, and sphincter of Oddi dysfunction.[4-7] Lifestyle factors like smoking and alcohol use independently or synergistically increase the risk.[8-9] Smoking may double the risk of non-gallstone-related AP and acts through mechanisms including oxidative stress, enzyme activation, and acinar cell injury.[10,11] Type 2 diabetes mellitus and abdominal adiposity also elevate the risk and severity of AP.[12,13]

Identifying the etiology early is critical for appropriate management and prevention of recurrence. With rising urbanization and lifestyle changes in young adults, understanding modifiable risk factors such as diet, obesity, smoking, and alcohol consumption is increasingly important. This study aims to explore these risk factors for acute pancreatitis in young adults.

Materials and Methods

This prospective observational study was conducted in the Department of Surgery, Dhaka Medical College Hospital, Dhaka, from 16th September 2020 to 15th September 2021. The study population included patients aged 20–40 years who were diagnosed with acute pancreatitis and admitted to the surgery department during the study period. A total of 100 patients were enrolled using purposive sampling, exceeding the calculated sample size of 81 based on the standard formula for prevalence studies. Patients with chronic, recurrent, post-procedural pancreatitis, pancreatic malignancy, pregnancy, trauma-related pancreatitis, immunocompromised conditions, or incomplete data were excluded.

Data were collected using a pre-structured Case Record Form (CRF) through patient interviews, clinical examination, medical records, and laboratory investigations. Risk factors evaluated included modifiable metabolic factors (obesity, gallstones/sludge), lifestyle factors (smoking, alcohol consumption, physical activity, dietary habits), and other factors such as hypertriglyceridemia and drug use. After informed consent, venous blood samples were collected for routine investigations. Data were processed, coded, and analyzed using SPSS (version 25), with results presented in tables and graphs. Statistical significance was considered at $p < 0.05$.

Results

A total of 100 young adult patients with acute pancreatitis were included in this study. The majority of patients were aged between 31–35 years, with a mean age of 36.9 ± 6.7 years. Males predominated (78%) compared to females (22%). Most patients were married (69%) and resided in urban slum areas (57%). Regarding occupation, the largest groups were day laborers (38%) and businessmen (23%) (Table I).

Table I: *Demographic Characteristics of Study Population (n = 100)*

Characteristic	Categry / Group	Frequency	Percentage (%)
Age (years)	20–25	4	4.0
	26–30	24	24.0
	31–35	43	43.0
	36–40	29	29.0
Mean ± SD		36.9 ± 6.7	
Gender	Male	78	78.0
	Female	22	22.0
Marital Status	Unmarried	28	28.0
	Married	69	69.0
	Separated/Divorced	3	3.0
Occupation	Service holder	17	17.0
	Businessman	23	23.0
	Day laborer	38	38.0
	Retired	6	6.0
	Housewife	11	11.0
	Unemployed / Others	5	5.0
Residence	Rural	36	36.0
	Urban slum	57	57.0
	Urban non-slum	7	7.0

Physical inactivity had predisposing factor, noted in 39.0% subjects, followed by sedentary habit in 21.0% subjects (Table II).

Table-II. *Evaluation of physical Activity (n=100)*

Physical Activity	Frequency	Percentage (%)
Occupational	20	20.0
Non-occupational	13	13.0
Physical inactivity	39	39.0
Sedentary habit	21	21.0
Leisure –time exercise	7	7.0

The prevalence of major predisposing conditions and risk factors showed that smoking was the most common (78%), followed by dyslipidemia (24%), diabetes mellitus (19%), history of instrumentation (12%), gallstone disease (8%), and alcohol consumption (5%) (Table III).

Table- III. *Association of other predisposing condition/ major risk factors (n=100)*

Risk factors	Number of patients	Percentage (%)
H/O Gallstone disease	8	8.0
Smoking	78	78.0
Alcohol consumption	5	5.0
H/O instrumentation	12	12.0
Diabetes mellitus	19	19.0
Dyslipidemia	24	24.0

Among smokers, most males were current smokers (80.7%), whereas most females were non-smokers (77.2%) (p = 0.038). Evaluation of body mass index (BMI) revealed that 44% of patients were overweight (BMI 25–29.9 kg/m²), 38% were obese (BMI 30–34.9 kg/m²), and 10% had normal BMI (18.5–24.9 kg/m²). No patient had a BMI >40 kg/m² (Table IV). Baseline risk factor characteristics indicated that physical inactivity and sedentary lifestyle were reported in 39% and 21% of patients, respectively. Overall, obesity was observed in 46% of participants.

Table-IV: *Evaluation of body mass index amongst patient (n=100)*

Body mass index (kg/m^2)	Number of patients	Percentage (%)
18.5–24.9	10	10.0
25.0–29.9	44	44.0
30.0–34.9	38	38.0
35.0–39.9	8	8.0
>40.0	0	0

Discussion

Present study demonstrates that maximum number of patients (43.0%) were between 31-35 years age group, mean age of the patient was 36.9 ± 6.7 years. Out of 100 cases 78% were male and 22% were female. Male and female ratio was 3.54:1. In this study and maximum patients (57%) hailing from urban slum.

Findings consistent with result of other previous studies. The risk of acute pancreatitis increases with age. Usually, smoking, alcohol-related pancreatitis is more common in middle-aged men. By contrast, pancreatitis in women is more frequent related to gallstones, instrumental procedures, and autoimmune diseases or to be idiopathic. Geographic variations observed in age and sex distribution can be partly explained by differences in etiology.[14,15]

Gallstones (including microlithiasis) are the most common etiology of acute pancreatitis, accounting for at least 35-45% of cases. However, only 3 to 7% of patients with gallstones develop pancreatitis. The risk increases with the age, female gender and small gallstones. The rising incidence of obesity is likely to contribute to acute pancreatitis by promoting gallstone formation.[2]

Smoking is important risk factor of acute pancreatitis. At this time, there is very little information about the pathogenesis of smoking-induced pancreatitis compared with those of other causes. Data from animal models suggest several potential mechanisms such as altered gene expression in the exocrine pancreas and activation of pancreatic enzymes with acinar cell damage. Nicotine has also been shown to modulate the oxidative stress and lipid peroxidation and these processes might be involved in the pathophysiology of acute and chronic pancreatitis. As is becoming evident with respect to alcohol, there may be other environmental and/or genetic factors that may promote pancreatic injury with smoking.[16]

In this study it was found that 78% of patients were smoker, H/O Gallstone disease were 8 patients, and only 12 patients had history of instrumentation. Drinking alcohol was reported in 5%, all of them were males. H/O diabetes mellitus were in 19.0% subject and dyslipidemia detected in 24.0% patients. Present study demonstrated that, prevalence of obesity is 46.0% patients.

It has been reported that smoking increases by approximately 2-fold the risk of non-gallstone-related acute pancreatitis, but not for gallstone-related pancreatitis. This risk was higher in patients who consumed alcohol, current smokers and those with more than 20 packs-years of smoking, particularly if they met the three characteristics (relative risk, 4.12).[9] It has been found that abdominal adiposity increases the risk and severity of acute pancreatitis. The overweight has similar effect for gallstone and non-gallstone-related inflammation.[10] Some studies found that type 2 diabetes mellitus increases the risk of acute pancreatitis (AP) by 1.5 to 3-fold, particularly in younger diabetic patients. This risk may be attributed to diabetes itself, but also to other associated factors with this metabolic disorder (gallstones, hypertriglyceridemia) or the use of antidiabetic drugs such as dipeptidyl peptidase 4 inhibitors (sitagliptin) or glucagon-like peptide 1 agonist (exenatide).[13]

The risk and etiology of pancreatitis differ with age and sex. Smoking is an independent risk factor for acute and chronic pancreatitis, and its effects could synergize with those of alcohol. Significant risk factors for pancreatic cancer include smoking and non-O blood groups.[3] Etiology of acute pancreatitis is diverse with many causes attributed to it. Alcohol abuse and gallstones are the leading causes of acute pancreatitis in western country. But alcohol consumption and its availability is restricted in Bangladesh. For this reason, alcohol induced pancreatitis is less in present study. Previous study reported that Gallstones and chronic alcoholism are the two most common etiological factors associated with AP. Other causes include drugs, infections, hyperlipidemia, trauma, hypercalcemia, HIV, neoplasms and idiopathic.[17]

Risk factors and etiology of AP can be established in most cases of AP. Although some cases can be challenging and in some patients, we may not find any etiology (idiopathic). Understanding the etiologic and risk factors of AP helps in formulating an appropriate management plan and helps to decrease the length of stay and cost associated with hospitalizations due to AP and might also lead to decrease in mortality due to AP.[17]

This study has certain limitations. It was conducted at a single centre, including only patients admitted to Dhaka Medical College Hospital (DMCH), which may not represent the overall population of the country. Additionally, as the study was carried out in a tertiary care hospital, the findings may not be generalizable to patients at primary or secondary care centres. Finally, the use of purposive sampling introduces the possibility of personal bias, which may affect the representativeness of the sample.

Conclusion

Present study demonstrated that sedentary lifestyle, obesity, alcohol, and tobacco are important risk factors of acute pancreatitis. Pancreatitis is a common digestive disorder with a broad spectrum of etiologies. Although most cases are secondary to biliary stones/ sludge or alcohol abuse, other potential causes should be considered once the two most common etiologies have been excluded. One of the primary goals in the diagnostic process of the pancreatitis should be to reduce the rate of idiopathic pancreatitis, because the identification of the cause of the disease may help to prevent subsequent relapses when the etiological factor is eliminated.

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