

Risk factors for acute idiopathic pancreatitis

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Abstract:

Objective: To determine the risk factors for Acute Idiopathic Pancreatitis (AIP) in a tertiary care hospital of Karachi.

Setting: Department of Surgery (Unit III), Dow University of Health Sciences, Civil Hospital, Karachi.

Duration: From 13th January 2016 to 14th June 2018.

Design: Cross sectional study.

Material and Methods: All cases of abdominal pain diagnosed as acute pancreatitis on the basis of history, clinical examination and serum amylase levels (>3 times normal) were included in the study. Imaging studies (ultrasound, Computed Tomography (CT) scan abdomen and Endoscopic retrograde cholangiopancreatography (ERCP) were conducted in each case to confirm the diagnosis. A thorough assessment was done to determine the cause of acute pancreatitis including the radiological findings, previous history of abdominal trauma or surgery along with past medical history, drug history and socioeconomic activities (alcohol/smoking/gutka/charas).

Results: 70 cases of acute pancreatitis including 23 idiopathic cases, we found Gutka Chewing as the leading risk factor for acute idiopathic pancreatitis especially in young male patients with atypical presentation.

Conclusion: Further studies are needed to determine the pathophysiological role of this increasingly important risk factor of acute pancreatitis.

Keywords: Idiopathic pancreatitis, Tobacco, Gutka chewing, Alcohol consumption

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Introduction:

Acute pancreatitis (AP) is a common clinical problem and the single most important gastrointestinal cause of hospital admissions worldwide leading to considerable morbidity and mortality.¹ Gall stone disease and alcohol consumption remain the most common etiological factors for acute pancreatitis for many decades.¹⁻³ But there are a significant number of patients in which no cause is identified after initial laboratory and imaging investigations. These are termed as ‘acute idiopathic pancreatitis (AIP)’ and account for 10-40% of cases of acute pancreatitis.⁴⁻⁶ As recurrence is a common and life threatening complication after an initial attack of acute pancreatitis,

it is vital to define the cause and offer appropriate management. Many studies have attributed microlithiasis and biliary sludge as the major risk factor for AIP.^{5,7} More recently smoking tobacco is identified as independent risk factor for development of acute pancreatitis.^{1,8}

Material & Methods:

This cross sectional study was conducted in Department of Surgery (Unit III), Dow University of Health Sciences, Civil Hospital, Karachi during 13th January 2016 to 14th June 2018. All cases of abdominal pain diagnosed as acute pancreatitis on the basis of history, clinical examination and serum amylase levels (>3 times nor-

Table-1: Causes of acute pancreatitis

Causes	No of cases	Percentage %
Gall stones	38	53.4
Alcohol	05	7.1
Post ERCP	03	4.3
Abdominal Trauma	01	1.4
Idiopathic	23	32.8
Total	70	100

Table-2: Risk factors for Acute Idiopathic Pancreatitis

Causes	No of cases	Percentage %
Tobacco chewing (Gutka)	07	30.4
Tobacco smoking (Cigarette)	03	13.1
No Risk factor Unidentified	13	56.5
Total	23	100

mal) were included in the study. Imaging studies (ultrasound, CT scan abdomen, MRCP, ERCP) were conducted in each case to confirm the diagnosis. Assessment of severity was done using Ransoms Scoring. A thorough review of clinical notes was done to determine the cause of acute pancreatitis including the history and clinical examination findings, routine laboratory results and radiological findings. Laboratory investigations included complete blood count (CBC), random blood sugar (RBS), serum amylase, serum calcium, liver function tests (LFTs), fasting lipid profile (fLP), Lactate Dehydrogenase (LDH and arterial blood gases (ABGs). Detailed review of CT scan films and ERCP findings also carried out. A further thorough enquiry into the past medical history (including previous history of abdominal trauma, surgery or ERCP), drug history and personal habits (alcohol/smoking/gutka/charas) was done in cases where no cause was found after routine laboratory and radiological investigations. The information was put in a specially designed proforma and data was analyzed using SPSS version 17. A thorough literature search was done regarding the causes and risk factors of IAP and results were compared.

Results:

A total of 70 cases of acute pancreatitis were included in the study using the inclusion criteria. Mean age of patients was 36.2 years and male to

female ratio was 1:2. The main cause of acute pancreatitis was gall stones, found in 38/70 patients (54.3%). Alcohol consumption was found only in 5 patients (7.1%). 3 patients (4.3%) had undergone ERCP while 1 patient (1.4%) developed acute pancreatitis after abdominal trauma. All of the patients had normal lipid profile and serum calcium levels. No cause was identified on the basis of routine laboratory and radiological examination in 23 patients (32.8%), the so called acute idiopathic pancreatitis (AIP) [table-1]. After a thorough search of the history notes including patients dietary habits, personal history of addiction and medications, it was revealed that at least 7 patients with AIP were addicted to gutka and another 3 were heavy smokers (consuming 20 cigarettes or more per day) [table-2]. In the group of 7 patients with gutka addiction, further analysis of age, gender, clinical presentation and severity of disease according to ranson criteria was done. All 7 patients were male and belong to younger age group. The ages (in years) were as follows: 20, 28, 34, 22, 21, 15, and 23). Four (4) of them had mild acute pancreatitis (Ranson's score 02) while 3 had severe acute pancreatitis (Ranson's score 3 or more) requiring prolonged hospital stay (12 to 22 days). The length of stay in mild acute pancreatitis was 5 to 8 days. The clinical presentation of 5 patients with a positive history of gutka addiction was atypical. All of them settled with conservative management and discharged. Recurrence of symptoms occurred in 1 patient requiring re-admission in surgical ward. No mortality was recorded in these patients.

Discussion:

Many studies have shown that tobacco smoking is an independent and important risk factor for development of chronic pancreatitis (CP).^{9,10} It is also proven to be a strong risk factor for development of pancreatic cancer.^{11,12} More recent studies have shown an association between tobacco smoking and acute pancreatitis) as well.^{1,8} But what is the underlying pathophysiology in developing acute pancreatitis is unknown. Studies have suggested that nicotine, which is the major component of cigarette smoke, plays

a central role. Chowdhry P et al concluded in one of his experimental studies on Dowary rats that nicotine effects the calcium (Ca^{+}) activated events which regulate the exocytic secretion of pancreas and plays an important role in promoting enhanced calcium levels inside the acinar cell.¹³ Similarly Lau PP et al. concluded that nicotine increases the biosynthesis of pancreatic enzymes which accumulate within the pancreas and alter the responsiveness to secretagogues with evidence of morphological damage.¹⁴ Another experimental study also suggest that nicotine can induce pancreatic injury by enhancing intracellular calcium release, which results in cytotoxicity and eventually cell death.¹⁵

The nicotine is also an important and major constituent of gutka (also known as smokeless tobacco) which is widely used in Asian countries especially India, Pakistan and Bangladesh. Its use is growing worldwide and Changrani J has termed paan and gutka an emerging threat for USA especially among South Asian immigrants.¹⁶ Gutka is commercially available in bright pouches/ sachets and is popular among people of all ages [Figure 1]. It particularly attracts young, because of cheap rates, bright colorful packets, easy accessibility and sweet taste. There are also widespread misconceptions that smokeless tobacco is a safe product through advertisements reporting a “positive” physiological effects, such as relaxation, increased concentration and diminished hunger.¹⁷ Gutka is consumed by placing it between the gum and cheeks followed by sucking or chewing. A population based case control study by Alguacil J et al. suggested that heavy use of smokeless tobacco may increase the risk of pancreatic cancer.¹⁸ Other well-known adverse health effects of gutka include periodontitis, oral pre-cancerous lesions (leukoplakia/erythroplakia); (oral submucosal fibrosis removed) gastrointestinal abnormalities^{19,20} oropharyngeal, esophageal and stomach cancers.²¹⁻²³ In our study we found an association between gutka chewing and development of acute pancreatitis especially in young male patents with atypical presentations i.e. presenting with a tense and tender abdomen mimicking peritonitis instead of epigastric pain

radiating to back.

Apart from tobacco, gutka consists of betel nut/ areca nut, slaked lime (Calcium Hydroxide) with some food additives and flavorings. The role of calcium in pancreatic pathophysiology is well known and hypercalcemia is an important trigger of acute pancreatitis.⁶ Studies have suggested that calcium activated events within the acinar cells are adversely affected by increased concentration of ionized calcium [Ca^{2+}] which lead to cytotoxicity, enzyme release and development of acute pancreatitis.^{13-15,24,25}

Gutka chewing may be associated to acute pancreatitis by a variety of mechanisms including the toxicological effects of nicotine or hypercalcemia caused by slaked lime (CaOH) which is contained in gutka in considerable amount. The results of our study suggest that Gutka chewing is a risk factor for many cases of acute idiopathic pancreatitis especially in young male patients. Unfortunately the role of gutka in the development of acute pancreatitis has not been studied in past and there are no clinical trials or population based studies to support the idea that gutka may be an important and avoidable risk factor for acute pancreatitis. Furthermore the amount of tobacco used in gutka cannot be quantified as it is a locally made product. There are no government legislations and regulations on manufacture, sale and use of this product. The amount of various ingredients used is highly variable and its consumption is also highly variable ranging from 6-12 packets a day. So when dealing with acute idiopathic pancreatitis or recurrent attacks of pancreatitis, physician must take a detailed history of personal habits and addiction to rule out this very important risk factor of acute pancreatitis especially in poor or low middle class population.

Conclusion:

We conclude that gutka chewing has many adverse health effects on pancreas. Apart from its role in development of pancreatic cancer, it may have a direct or indirect association with acute pancreatitis and may be responsible for recurrent attacks of acute pancreatitis especially

among adolescents and young adults. We recommend that further population based as well as experimental studies should be done to determine the pathophysiological effects of gutka in causation of acute pancreatitis.

Conflict of interest: None

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Role and contribution of authors:

Dr Abdul Qaiyoume Amini, conceived the idea and did the initial writeup.

Dr Naveed Ali Khan collected the data and references and helped in introduction writing.

Dr Khursheed Ahmed Samo, helped in collecting the data and references and helped in discussion writing.

Dr Amjad Siraj Memon, critically review the article and made the final changes.

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