DOI: https://doi.org/10.53350/pjmhs22163227

ORIGINAL ARTICLE

Association of Smoking and Alcohol with Acute Pancreatitis in Patients presenting in Tertiary Care Hospital Lahore

RABIA RAMZAN[1], AQEEL ASHRAF[2], MUHAMMAD HASSAAN[3], ABEERA ISHAQ BUTT[4], SYED ASGHAR NAQI[5], FOWAD KARIM[6]
[1]*House Officer at Mayo Hospital, Lahore.*
[2]*Ex-post graduate resident at Department of Surgery, Mayo Hospital, Lahore.*
[3]*Medical officer at Mayo Hospital, Lahore.*
[4]*Post graduate resident at Department of Surgery Mayo Hospital, Lahore.*
[5]*Chairman Department of Surgery at Mayo Hospital, Lahore.* [6]*Senior registrar at Department of Surgery, Mayo Hospital, Lahore.*
Correspondence to: Dr. Rabia Ramzan, Email: rabiaramzan042@gmail.com, Contact Number: 03316660637

ABSTRACT

Introduction: Acute pancreatitis refers to the reversible inflammatory process of pancreas. Various researches report that smoking and heavy alcohol consumption increase the risk of acute pancreatitis.

Material and methods: This research, carried out at Department of Surgery in Mayo Hospital, Lahore, has a sample size of 294, sampling technique being non probability sampling. Inclusion and exclusion criteria were applied.

Results: Alcoholism and smoking were found to be the risk factors for acute pancreatitis among people participating in this study.

Discussion: Both smoking and alcoholism are risk factors for acute pancreatitis, this is supported by various researches done in the past. Strength of this study includes a large sample size as well as inclusion of both cases and controls. However, effect of smoking and alcoholism on outcome of these patients has not been studied in this research.

Conclusion: Public health measures for awareness and timely management of the diagnosed cases can reduce the disease burden and disease severity.

Key words: Alcoholism, cigarette smoking, acute pancreatitis.

INTRODUCTION

Acute pancreatitis (AP), a common reason for emergency admissions worldwide (1), is the reversible inflammatory process of pancreas (2). The annual incidences of AP fall in the range of 4.9 and 35 cases per 100,000 people (3) and 30 and 45 per 100,000 person years (4), varying geographically. In the past few decades, increasing trend of hospital admissions related to AP has been observed(5)

Three prospective cohort studies that were conducted in Western population have established a dose response relationship between smoking and pancreatitis [6,7]. In a cohort study that included Danish population, individuals consuming 15 to 25 or more cigarettes per day were found to have 2.5 (95% CI, 1.5-3.9) and 3.3 (95% CI, 1.9-5.9) times higher risk of pancreatitis than non-smokers; 46% of these cases were attributed to smoking [5]. A cohort study conducted in Sweden found that current smokers having 20 or more pack years of smoking were found to have 2.29 (95% CI, 1.63-3.22) times increased risk of AP, that was not related to gallbladder stones, compared with non-smokers [6]. Meta-analysis by Sun X et al proved that current smokers had a 40% increased risk of AP for every additional 10 cigarettes per day [7]. A population-based cohort study in Denmark reported association of increased alcohol intake with higher risk of pancreatitis [8]. Yadav et al. reported that cigarette smoking and heavy alcohol drinking increase risk of pancreatitis [9].

A cohort study that was based on population by Lin et al in Taiwan showed no relationship between cigarette smoking and pancreatitis, but the risk of pancreatitis was increased at all levels of alcohol use. In contrast, studies conducted in Western population (10) revealed that >5 drinks per day increase the risk of AP, smoking being a dose dependent risk factor for AP, and the frequency of alcohol consumption (32.0% vs. 18.5%) and smoking (40.90% vs. 17.1%) was higher among cases as compared to controls [10,11,12].

In Asian population, the risk of pancreatitis increased in all levels of alcohol use, with a clear dose-response relation [13]. No such study has been conducted in Pakistan, but genetic polymorphisms in Asian population suggest that Asians may be more prone to develop pancreatitis related to alcohol consumption[14].

This study aims to investigate the association among smoking, alcohol use and acute pancreatitis in patients presenting in tertiary care hospital of Lahore, Pakistan.

MATERIALS AND METHODS

The research was conducted at the Department of Surgery, Mayo Hospital, Lahore within the duration of 6 months (from 25-11-2019 to 24-05-2020). It is a case control study, with a sample size of 294 patients selected by non-probability, consecutive sampling that included 147 patients in each group, calculated with 5% level of significance and 80% power of test, taking expected frequency of alcohol consumption to be 32.0% in cases and 18.5% in controls [10,12]. Inclusion criteria for cases included age 18-60 years, both genders and diagnosis of acute pancreatitis as per operational definition, while cases with acute on chronic pancreatitis or those with medical records showing history suggestive of recurrent episodes of acute pancreatitis along with relevant investigation were excluded as per exclusion criteria. Patients of both genders, age 18-60 years who were healthy siblings or first cousins or friends that lived with patients were included among the control group. After taking written informed consent, participants were interviewed, inquired about any history of smoking or alcohol consumption and were asked to complete patient proforma. Data was entered into SPSS Version 22 and analysed. Mean ± S.D were taken for quantitative variables e.g. age; frequency and percentage were taken for qualitative variables e.g. smoking and alcohol consumption. Frequency of smoking and alcohol consumption has been compared between cases and controls using chi-square test taking p-value ≤0.05 as significant and OR (odds ratio) has been determined taking OR >1 as significant. Data has been stratified for age, gender, no. of cigarettes per day, alcohol consumption (light/heavy) and residence (rural/urban). After stratification, chi-square test has been applied taking p-value ≤0.05 as significant and OR has been recalculated taking OR >1 as significant.

RESULTS

The mean age of participants was 42.69±11.60 years and majority (n=169, 57.5%) were 40 years and above. There were 96 (32.7%) male and 198 (67.3%) female patients with a male to female ratio of 1:2. 145 (49.3%) patient had a rural background while 149 (50.7%) had urban residence. History of smoking was recorded in 120 (40.8%) patients while 34 (11.6%) patients gave history of alcoholism as summarized in table 1

Any statistically significant difference between the study groups, in terms of mean age (p-value=0.794) and distribution of

various subgroups based on age (p-value=0.906), gender (p-value=0.804) and residence (p-value=0.907), was not observed.

The frequency of smoking (48.3% vs. 33.3%; p-value=0.009; 95%CI OR=1.87) was significantly higher in cases as compared to controls. Similar difference was noted across various subgroups based on age, gender, residence, alcoholism and number of cigarettes per day. Both the alcoholism and increased no. of cigarettes per day were found to further increase the odds of having acute pancreatitis with smoking as shown in Table 2

The frequency of alcoholism (13.6% vs. 9.5%; p-value=0.274; 95%CI OR=1.50) was higher in cases as compared to controls but the difference didn't reach statistical significance. Similar difference was noted across various subgroups based on age, gender, residence, smoking and amount of alcohol consumed per day. Both the smoking and increased amount of alcohol consumed per day were found to further increase the odds of having acute pancreatitis with alcoholism as shown in Table 2

Table 1: Baseline Characteristics of Study Population

Characteristics	Participants n=294
Age (years)	42.69±11.60
● 18-39 years	125 (42.5%)
● 40-60 years	169 (57.5%)
Gender	
● Male	96 (32.7%)
● Female	198 (67.3%)
Residence	
● Rural	145 (49.3%)
● Urban	149 (50.7%)
Smoking	
● Yes	120 (40.8%)
● No	174 (59.2%)
Alcoholism	
● Yes	34 (11.6%)
● No	260 (88.4%)

Table 2: Comparison of Smoking and alcoholism between Cases and Controls and Estimation of Odds Ratio across Alcoholism and smoking respectively n=294

Smoking	Alcoholism	Cases (n=147)	Controls (n=147)	Total	P-value	95%CI OR
Yes (n=120)	Yes	10 (14.1%)	3 (6.1%)	13 (10.8%)	0.168	2.51
	No	61 (85.9%)	46 (93.9%)	107 (89.2%)		
	Total	71 (100.0%)	49 (100.0%)	120 (100.0%)		
No (n=174)	Yes	10 (13.2%)	11 (11.2%)	21 (12.1%)	0.698*	1.20
	No	66 (86.8%)	87 (88.8%)	153 (87.9%)		
	Total	76 (100.0%)	98 (100.0%)	174 (100.0%)		
Alcoholism	Smoking	Cases (n=147)	Controls (n=147)	Total	P-value	95%CI OR
Yes (n=34)	Yes	10 (50.0%)	3 (21.4%)	13 (38.2%)	0.092	3.67
	No	10 (50.0%)	11 (78.6%)	21 (61.8%)		
	Total	20 (100.0%)	14 (100.0%)	34 (100.0%)		
No (n=260)	Yes	61 (48.0%)	46 (34.6%)	107 (41.2%)	0.028**	1.75
	No	66 (52.0%)	87 (65.4%)	153 (58.8%)		
	Total	127 (100.0%)	133 (100.0%)	260 (100.0%)		

Chi-square test, *Observed difference was statistically insignificant, **Observed difference was statistically significant, 95% CI = Confidence interval, OR = Odds Ratio

DISCUSSION

Atlanta Symposium defines acute pancreatitis as the inflammatory disease of pancreas that may involve peri-pancreatic tissues and/or remote tissues (1). Despite the fact that its incidence is rising worldwide (2,3), literature lacks in establishing the relationship between risk factors, like alcoholism and smoking, and the associated risk of acute pancreatitis (5,7), necessitating the need for present study.

The objective of this study was to determine the association of smoking and alcohol with acute pancreatitis in patients presenting in Mayo Hospital, Lahore. The demographic variables of cases and controls were comparable, excluding any inherent bias in the study.

In the present study, mean age of patients was 42.69±11.60 years. Similar mean ages were taken in studies conducted at (116) Jinnah Postgraduate Medical Centre, Karachi (43±11.5 years), at Benazir Bhutto Hospital, Rawalpindi (43.4±16.3 years) (117), among Indian patients (44.8±14.2 years) (118), among patients of Bangladesh (45.5±12.2 years) (119), among patients of Saudi Arab (42±25.4 years) (120), among Malaysian patients (42.5±13.8 years) (121) and among Swedish patients (43.5±11.8 years) (122). A probable reason for this age distribution maybe the fact that most people start smoking or alcohol consumption in their 20s and the rest of time being taken in the development of disease and its diagnosis.

The participants of this study included 96 (32.7%) male and 198 (67.3%) female patients with a male to female ratio of 1:2. This ratio was similar in the researches at Jinnah Postgraduate Medical Centre Karachi (1:2) (116), at Combined Military Hospital Sialkot (1:2.1) (123), at Benazir Bhutto Hospital, Rawalpindi (1:2) (117), at Turkey (1:2) (124,125), at Switzerland (1:2) (126), at UK (1:2) (127 and at Malaysia (1:2) (121), establishing the female predominance in cases of acute pancreatitis. In contradiction to this, acute pancreatitis due to gall stones was more prevalent among males in a study in Pakistan.

We observed that 13.6% of patients with acute pancreatitis had history of alcohol ingestion. Similar was the case in various researches at Aga Khan University Hospital, Karachi (13.0%) (128,129), at Combined Military Hospital Sialkot (15.8%) (123), at Aga Khan University Hospital, Karachi (9.0%) (130). Similarly 17% of patients with acute pancreatitis had history of alcohol consumption in a study carried out in Sweden.

In the present study, smoking (48.3% vs. 33.3%; p-value=0.009; 95%CI OR=1.87) and to a lesser extent alcoholism (13.6% vs. 9.5%; p-value=0.274; 95%CI OR=1.50) were associated with increased odds of having acute pancreatitis. Similar association was observed across various subgroups based on age, gender, residence, no of cigarettes per day (95%CI OR 1.25 vs. 2.77) and amount of alcohol consumed per day (95%CI OR 1.40 vs. 1.68). This was comparable to the research in Japan where association between acute pancreatitis and smoking (60.7% vs. 50.5%; p-value<0.05; 95%CI OR=2.6) and alcoholism (67.5% vs. 50.1%; p-value<0.05; 95%CI OR=1.7) was found (131). In China, smokers and alcoholics had more odds of having the disease than non-smokers and non-drinkers with 95%CI OR of 1.52 and 1.45 respectively [132]. This was comparable to the researches at Korea (95% CI OR=2.59) (6), at Sweden (95% CI OR=2.29) (133), at Denmark (95%CI OR=1.4) (8). Another study in Denmark showed risk of acute pancreatitis to be 2.6 times higher in smokers (6). In Saudi Arab, there was similar incremental risk of AP with smoking from less than 10 cigarettes per day to more than 10 cigarettes per day (95CI OR 1.4 vs. 3.6) (134).

Present study adds to the limited published international research evidence on the topic, establishes that both the smoking and alcoholism are independent predictors of acute pancreatitis and the hazard associated with their use is not affected by

patient's demographic characteristics. Smoking and to a lesser extent alcoholism were found to be associated with increased odds of having acute pancreatitis and the cumulative risk of smoking and alcoholism was even far greater than smoking and alcoholism alone, emphasizing the need of timely public health measures and awareness among the general population.

The strengths of the present study include its large sample size of 294 cases and case-control design. The data was also stratified to address effect modifiers. However the present study lacks in a way that we didn't consider the effect of smoking and alcoholism on the outcome of patients with pancreatitis. This can be included in the future studies.

CONCLUSION

In the present study, smoking and to a lesser extent alcoholism were found to be associated with increased odds of having acute pancreatitis. The cumulative risk of smoking and alcoholism was even far greater than smoking and alcoholism alone which warrants public health measures against smoking and alcoholism to decrease the likelihood of acute pancreatitis as well as consideration of such patients at higher risk of pancreatitis so that timely identification and anticipated management may improve the outcome of such cases.

REFERENCES

1. Habtezion A. Inflammation in acute and chronic pancreatitis. Curr Opin Gastroenterol 2015;31(5):395-9.
2. Akhter S, Rehman Khan ZU, Ahmed B, Ahmed F, Memon ZA. Complications of acute pancreatitis in tertiary care hospital. Int J Hepatob Pancreat Dis 2017;7:23-7.
3. Lankisch P, Apte M, Banks P. Acute pancreatitis. Lancet 2015;14:1-8.
4. Satoh K, Shimosegawa T, Masamune A, Hirota M, Kikuta K, Kihara Y, et al. Nationwide epidemiological survey of acute pancreatitis in Japan. Pancreas 2011;40(4):503-7.
5. Tolstrup JS, Kristiansen L, Becker U, Gronbaek M. Smoking and risk of acute and chronic pancreatitis among women and men: a population-based cohort study. Arch Intern Med 2009;169(6):603-9.
6. Sadr-Azodi O, Andren-Sandberg A, Orsini N, Wolk A. Cigarette smoking, smoking cessation and acute pancreatitis: a prospective population-based study. Gut 2012;61(2):262-7.
7. Sun X, Huang X, Zhao R, Chen B, Xie Q. Meta-analysis: Tobacco smoking may enhance the risk of acute pancreatitis. Pancreatology 2015;15(3):286-94.
8. Kristiansen L, Gronbaek M, Becker U, Tolstrup JS. Risk of pancreatitis according to alcohol drinking habits: a population-based cohort study. Am J Epidemiol 2008;168(8):932-7.
9. Yadav D, Whitcomb DC. The role of alcohol and smoking in pancreatitis. Nat Rev Gastroenterol Hepatol 2010;7(3):131-45.
10. Lin HH, Chang HY, Chiang YT, Wu MS, Lin JT, Liao WC. Smoking, drinking, and pancreatitis: a population-based cohort study in Taiwan. Pancreas 2014;43(7):17-22.
11. Woming H. Incidence and prevalence of chronic pancreatitis. Chronic pancreatitis. Springer; 1990. p. 8-14.
12. Iqbal M, Malik M, Perveen S. Morbidity and mortality in acute pancreatitis. J Surg Pak 2015;20(4):128-32.
13. Hameed T, Khan AZ, Shah I, Khan AQ, Ahmad M. Factors leading to acute pancreatitis in tertiary care hospitals in Pakistan–a multicentre study. J Rawal Med Coll 2018;22(1):50-3.
14. Raza M, Venkata VM. Per-operative conversion of laparoscopic cholecystectomy to open surgery: prospective study at JSS teaching hospital, Karnataka, India. Int Surg J 2017;4(1):81-5.
15. Haq AMM, Giasuddin ASM, Jhuma KA, Choudhury MAM. Effect of cholecystectomy on lipid profile in Bangladeshi patients with cholelithiasis. J Metabol Synd 2015;5:192.
16. Al-Qahtani HA. Early versus interval cholecystectomy after mild acute gallstone pancreatitis: A 10 year experience in central Saudi Arabia. J Taibah Uni Med Sci 2014;9(4):322-7.
17. Noel R, Arnelo U, Lundell L, Hammarqvist F, Jumaa H, Enochsson L, et al. Index versus delayed cholecystectomy in mild gallstone pancreatitis: results of a randomized controlled trial. HPB (Oxford) 2018;182X(18):30791-3.
18. Haider MIZ, Rashid H, Saeed S, Murtaza B, Ali S. Clinico-pathological pattern of acute pancreatitis – a single centre study. Pak J Pathol 2017;28(2):92-7.
19. Demir U, Yazıcı P, Bostancı Ö. Timing of cholecystectomy in biliary pancreatitis treatment. Ulus Cerrahi Derg 2014;30(1):10-3.
20. Nebiker CA, Frey DM, Hamel CT, Oertli D, Kettelhack C. Early versus delayed cholecystectomy in patients with biliary acute pancreatitis. Surgery 2009;145(3):260-4.
21. Johnstone M, Marriott P, Royle TJ, Richardson CE, Torrance A, Hepburn E, et al. The impact of timing of cholecystectomy following gallstone pancreatitis. Surgeon 2014;12(3):134-40.
22. Abbasi AH, Abid S. Acute pancreatitis; a comparative study to assess the clinical outcome of acute pancreatitis in relation with major etiologies. Professional Med J 2019;26(4):658-62.
23. Alvi AR, Sheikh GM, Kazim SF. Delayed surgical therapy reduces mortality in patients with acute necrotizing pancreatitis. J Pak Med Assoc 2011;61(10):973.
24. Kume K, Masamune A, Ariga H, Shimosegawa T. Alcohol consumption and the risk for developing pancreatitis: a case-control study in Japan. Pancreas 2015;44(1):53-8.
25. Pang Y, Kartsonaki C, Turnbull I, Guo Y, Yang L, Bian Z, et al. Metabolic and lifestyle risk factors for acute pancreatitis in Chinese adults: a prospective cohort study of 0.5 million people. PLoSMed 2018;15(8):e1002618.
26. Kim DB, Chung WC, Lee JM, Lee KM, Oh JH, Jeon EJ. Analysis of factors associated with the severity of acute pancreatitis according to etiology. Gastroenterol Res Pract 2017;2017:1219464.
27. Alzahrani AA, Zaki O, Hariri M, Alsubhi NA, Alshehri MF, Alharthi HJ, et al. The effect of cigarettes on acute pancreatitis among patients in Saudi Arabia. Egypt J Hospital Med 2017;69(8):3108-14.