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Acute Pancreatitis in a Multi-Ethnic Population

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ABSTRACT

There is very little information in literature describing ethnic variations in etiologic and clinical outcome of acute pancreatitis in the Asian population. This study describes the demographic, etiologic and clinical course of acute pancreatitis among the three main races in Malaysia namely, the Malays, Chinese and Indians. One hundred and thirty-three consecutive patients were admitted for acute pancreatitis for the period January 1994 to July 1999 and they consisted of 77 males and 56 females with a mean age of 43.5 years (SD+/- 14.7). The racial breakdown of acute pancreatitis was: Malays 38 (28.6%), Chinese 19 (14.3%), Indians 75 (56.4%) and 1 (0.8%) patient was an orang asli. The incidence of alcohol association with acute pancreatitis was significantly increased in the males, while gallstone pancreatitis was principally a disease of the female. Alcohol was identified as the predominant factor associated with acute pancreatitis among the Indians (73.3%) and in contrast, gallstone was the commonest associated etiologic factor for the Malays and Chinese. No etiologic factor could be identified in a substantial proportion of the Malay patients (60.5%) when compared to the Chinese (36.8%) and Indians (35%). Severe disease developed in 25% of the cases reviewed but there was no difference in of the rate of severe pancreatitis in terms of ethnic groupings or etiologic factors. The overall mortality rate was 7.5% and the commonest cause of death was multi-organ failure.

The study recognises that there are differences in the characteristics of acute pancreatitis among the three major races in the country and this divergence is primarily due to socio-cultural habits.

Keywords: Acute pancreatitis, racial differences, Malaysia

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INTRODUCTION

Acute Pancreatitis is a common disorder with potentially devastating consequences. It is a multifaceted disease with multiple etiologies and there is a wide variability in the presentation and clinical course of the disease[1-3]. The incidence of acute pancreatitis is known to differ geographically due to differences in alcohol consumption or in incidence of gallstones disease in different parts of the world[4,5]. Nearly 25% of all attacks of pancreatitis have severe complications and the death rate of clearly diagnosed cases has remained high at 10-25% over the past 20 years[5-7]. Most studies on acute pancreatitis are based on the Western population[8]. It is generally perceived that acute pancreatitis runs a benign course in Asian countries and the etiology is different from that of the Western population. Malaysia is a unique nation in that its population is multiracial with three major races, namely, the Malays, Chinese and Indians. There is very little information in literature describing ethnic variations in etiology and clinical outcome of acute pancreatitis in the Asian population. This review describes the demographic, etiological and clinical course of acute pancreatitis in Malaysia and examines the variations among the three main races.

PATIENTS AND METHODS

The study was conducted at Ipoh Hospital, a 900-bedded referral hospital located in the city of Ipoh in the West Coast of Peninsular Malaysia. It is a retrospective study of 200 consecutive admissions for acute pancreatitis for the period January 1994 to July 1939. The diagnosis of acute pancreatitis was accepted when a compatible clinical syndrome was associated with raised serum amylase of more than three times the normal value or a raised urine diastase. Evidence from laparotomy was also accepted for the diagnosis. Ultrasonography was routinely performed for all patients diagnosed to have acute pancreatitis and contrasted dynamic computerised tomography (CT) scan was performed on patients judged to have severe disease.

Alcohol was considered the etiology when patient volunteered a history of a recent binge of alcohol or reported a regular high intake. Gallstone related disease was based on identification of gallstones by ultrasound, endoscopic retrograde cholangiopancreatograpy (ERCP) or CT scan. Post ERCP pancreatitis was diagnosed if the disease occurred within a week of the procedure. When acute pancreatitis occurred during pregnancy or in the immediate post-partum period, the etiology was considered to be pregnancy related. The etiology was considered to be unknown when no identifiable factor could be found.

The severity of acute pancreatitis was stratified using the clinically based system developed at the International symposium convened in Atlanta, Georgia in 1992[9]. The disease was considered severe in the presence of organ failure or local complications such as necrosis, pseudocyst or abscess (see appendix 1). Aggressive treatment in an intensive care or a high dependency unit was instituted if a diagnosis of severe acute pancreatitis was made. All complications were managed with appropriate surgical approaches.

RESULTS

The 200 consecutive admissions for acute pancreatitis during the period of study occurred in 133 patients. Sixteen patients had recurrent admissions and they accounted for 67 episodes of admission. The mean age of the patients was 43.5 years (SD ± 14.7 years) and they consisted of 77 males and 56 females (M: F = 1.4:1). The racial breakdown of acute pancreatitis was: Malays 38 (28.6%), Chinese 19 (14.3%), Indians 75 (56.4%) and 1 (0.8%) patient was an orang asli (Table I). In contrast, the distribution of the population in the State of Perak is: Malays 46.7%, Chinese 34.0% and Indians 13.2%[10]. The admission practice of Hospital Ipoh and the Surgical Department is similar to this distribution. There was a significant increase in the incidence of acute pancreatitis among Indians compared to other races ($p<0.005$). There was a female predominance of the disease among Malays; however, among Indians there was male preponderance ($p<0.005$). The sex difference seen among the Chinese was not statistically significant.

Alcohol was identified as the predominant factor associated with acute pancreatitis in this study and it was noted in 63 patients (47.7%). Twenty-one patients (15.9%) were diagnosed to have gallstones pancreatitis and other factors identified in 13 patients included post ERCP; five patients (3.8%), pregnancy; five patients (3.8%), trauma; two patients (1.5%) and hyperlipidaemia; one patient (0.8%). In 36 patients (27.1%), no known factors would be identified (Table II).

Table I. Distribution of cases according to ethnicity.

	Malay	Chinese	Indian	Total
Sex	No. (%)	No. (%)	No. (%)	No. (%)
Male	10 (13.2%)	8 (10.5%)	58 (76.3%)**	76 (100%)
Female	28 (50%)***	11 (19.6%)	17 (30.4%)	56 (100%)
Total	38 (28.8%)	19 (14.4%)	75 (56.8%)*	132# (100%)

This table excludes the orang asli patient.
*p<0.005 **p<0.005 ***p<0.005

Alcohol as an etiologic factor was significantly increased among the Indians when compared to the other races ($p<0.001$). Fifty-five (73.3%) Indians were diagnosed to have alcohol related acute pancreatitis. In Malays and Chinese, gallstone disease was recognised as important cause of pancreatitis. Interestingly, no identifiable factor could be found for the pancreatitis in 60.5% of the Malays ($p<0.001$).

Table II. Distributions of etiologic factors among ethnic groups.

	Malay	Chinese	Indian	Total
Etiology	No. (%)	No. (%)	No. (%)	No. (%)
Alcohol	3 (7.9%)	5 (26.3%)	55 (73.3%)*	63 (47.7%)
Gallstones	10 (26.3%)	6 (31.6%)	5(6.7%)	21 (15.9%)
Unknown	23 (60.5%)**	7 (36.8%)	6 (8.0%)	35 (26.5%)
Others	2 (5.3%)	1 (5.3%)	9 (12.0%)	13 (9.9%)
Total	38 (100%)	19 (100%)	75 (100%)	132# (100%)

This table excludes the orang asli patient.
*p<0.001 **p<0.001

The incidence of alcohol association with acute pancreatitis was significantly increased in the males, ($p<0.001$) while gallstone pancreatitis was predominantly a disease of the female (Chart 1).

Chart 1. Distribution of Etiology and Sex.

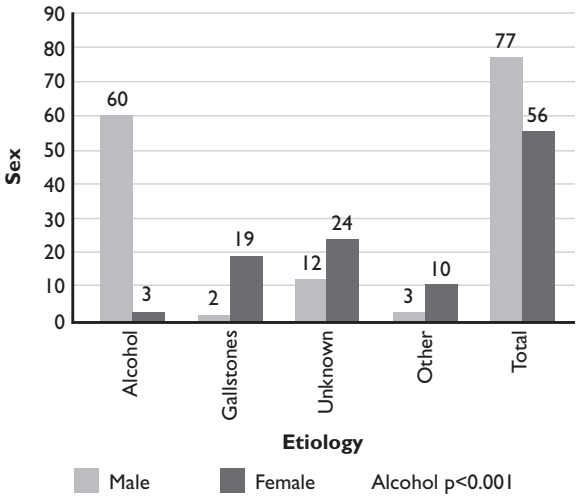

Table III. Ethnicity and severity of disease.

Ethinicity	Mild n = 99 (75.0%)	Severe (Non-Fatal) n = 23 (17.4%)	Severe (Fatal) n = 10 (7.6%)	Total n = 132#
Malay	29 (76.3%)	5 (13.2%)	4 (10.5%)	38
Chinese	12 (63.2%)	5 (26.3%)	2 (10.5%)	19
Indian	58 (77.3%)	13 (17.3%)	4 (5.3%)	75

This table excludes the orang asli patient

Table IV. Etiology and severity of disease.

Ethinicity	Severity of disease	
	Mild n = 100 (75.0%)	Severe n = 33 (25.0%)
Alcohol	46 (73.0%)	17 (27.0%)
Gallstone	16 (76.2%)	5 (23.8%)
Unknown	25 (69.4%)	11 (30.6%)
Others	13 (100%)	0 (0%)

Table V. Complications associated with severe disease.

Systemic Complications	Frequency
Pulmonary	22
Circulatory	15
Renal	12
DIVC	5
Local Complications	
Pancreatic pseudocyst	5
Pancreatic abscess	1
Pancreatic necrosis	6
Pancreatic fluid collection	11

Using the Atlanta classification, 99 (75.0%) of the acute pancreatitis were classified as mild disease, while 33 (25.0%) as severe disease (Table III). Twenty-seven patients manifested organ dysfunction-involving lungs, renal and cardiovascular system and many had involvement of multiple organs. Local complications in the form of pseudocyst, necrosis and abscess were seen in 12 patients (Table V). There were 10 deaths, giving a mortality rate of 7.5% and all occurred in patients with severe disease. Ethnic differences and etiologic factors did not have any influence on the severity of the disease (Table III & IV).

DISCUSSION

The factors capable of precipitating acute pancreatitis are numerous and varied. Nevertheless, biliary lithiasis and alcohol together account for about 80% of the disease[1,2]. Historically, gallstones were recognised to be the predominant factor responsible for acute pancreatitis, representing 40 to 60 per cent of cases[4,5,11,12]. However, more recent reports suggest alcohol as the most common etiological factor[6,13,14]. In our study alcohol was similarly identified as the most important etiologic factor associated with acute pancreatitis, accounting for 47.7% of the cases. Alcohol related pancreatitis was particularly excessive among the Indians and was observed in 73.3% of the cases. It is an established fact, that alcohol dependence is higher among Indians when compared to the other races in the country[15-17]. The high alcohol consumption in the Indian community is a social behaviour carried forward from the days when many of them were labourers in the plantations. It is therefore, no surprise to see that alcohol related pancreatitis is significantly higher in this sub-group of the population.

The divergence in the etiological pattern and incidence of acute pancreatitis among the ethnic groups has been influenced by the alcohol-related behavioural pattern of the Indians. The characteristic of acute pancreatitis in the Indian community in Malaysia is similar to that of the Sowetan Africans where alcohol was identified as the predominant etiologic factor in 83.1% of cases[18]. Alcohol as an etiology was uncommon among the Malays as religion prohibits Muslims from consuming alcohol. A similar observation was made by Mahendra RS, et al in a study performed in a predominantly Muslim community from the North-Eastern Peninsular Malaysia[8].

Gallstone was identified as an etiologic factor in 16% of the cases. There is probably an underestimate of gallstones as the etiologic factor in our study. In 27% of the cases reviewed, no known factors could be identified. It is possible that small gallstones and biliary sludge were missed in the routine ultrasound examination of the biliary system. The sensitivity of routine ultrasonography in the detection of gallstones is reported to in the range of 87 to 98%[19,20]. Several studies have shown that biliary sludge can be detected in many patients labelled as "idiopathic" pancreatitis[21,22]. It is important to be thorough with investigations in this group of patients and repeat examination may increase the proportion with an identified etiology.

The extent of incidence where the known etiological factors are not identified will vary according to the thoroughness of the assessment. However, this does not explain the substantially high proportion of cases where etiology could not be identified among the Malays (60.5%) when compared to the Chinese (20%) and the Indians (17.1%). The report by Mahendra RS et al similarly could not establish the etiology in most of the cases in the predominantly Malay community[8]. They noted abnormal serum transaminase levels in 35% of the cases and concluded the possibility of biliary microliths as a possible cause. It may be

postulated that miroliths and biliary sludge may be a problem peculiar to the Malay community. The most effective plan of treatment for acute pancreatitis is aimed at identifying the mechanism responsible for its development. The investigation into the etiology of acute pancreatitis in the Malay community will have to include more sensitive tools like Endoscopic retrograde cholangiopancreatography (ERCP), endoscopic ultrasonography or magnetic resonance cholangiography.

The report from the Northeastern part of Malaysia proposed Ascaris to be included as an important cause of acute pancreatitis. Reports from India and China also recommend the inclusion of Ascaris as an etiologic factor in developing countries where the disease can be endemic[23-25]. These studies recognised ERCP as an excellent diagnostic tool to delineate the worms in the biliary tract. However, the use of ERCP and ultrasound imaging of the biliary tract did not identify ascaris as an etiologic factor of pancreatitis in our study.

Acute pancreatitis is protean disease, capable of wide clinical variation ranging from a mild, self-limiting disease to a severe disease with devastating consequences[2]. Studies on acute pancreatitis based on the Western population disease[24]. Severe disease is characterised by organ failure and/or local estimate 20% to 30% of all patients will have a severe clinical course of the complications such as necrosis, pseudocyst or abscess and 95% of deaths will occur in this subset.

In this study, a significant number of patients (25.0%) developed organ dysfunction or local complications. The characteristics of acute pancreatitis in the patients studied were not different when compared to the West with regards to the severity of the disease and the nature of complications.

The precise mortality rate from acute pancreatitis is difficult to ascertain due to variations in diagnostic threshold and inconsistent use of autopsy data. It is generally reported that the overall mortality of acute pancreatitis is 5-10% and may increase to 35% or higher if complications develop[7,26,27]. The mortality rate of 7.5% in this review is comparable with other reports; however it is relevant to recognise that there are many compounding factors, including the age of the patient, coexisting medical problems, amount of pancreatic necrosis and infection of the pancreatic necrosis. The majority (80%) of deaths among those with acute pancreatitis are due septic complications as a consequence of bacterial infection of pancreatic necrosis[26]. In our study, six patients had pancreatic necrosis and only one patient developed an abscess.

CONCLUSION

There are striking differences of the etiological factors associated with acute pancreatitis among the three races. The divergence is due to differences in alcohol consumption among the races. The proportion of cases where the etiologic factors could not be identified was substantially higher in the Malay race. As the present approach to identifying the etiological factor in them is not effective and a more sensitive investigative tool may have to be considered. Identifying the etiological factor may have a significant impact on patient management and prevent recurrence of the disease. The type of complications and extent of severe acute pancreatitis are similar to that reported in developed countries and appropriate management strategies must be adopted for better outcome.

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