ORIGINAL RESEARCH

Acute pancreatitis at a tertiary hospital in Addis Ababa, Ethiopia: A 4-year retrospective study

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Abstract

Background
Acute pancreatitis is not uncommon in our setting but there is no study on the hospital incidence and treatment outcomes in our country. The study attempts to determine the incidence, cause and outcome of acute pancreatitis in Menelik II referral hospital Addis Ababa, Ethiopia, from September 1, 2012 – August 31, 2016.

Methods
A four-year cross-sectional retrospective study was conducted to review acute pancreatitis in Menelik II referral hospital Addis Ababa, Ethiopia. The data was collected using structured and pretested questionnaire by trained data collectors and checked for its completeness, then entered, edited, cleaned and analyzed using SPSS software version 20 for determination of frequency, percentage and cross-tabulation with different variables; "95%" confidence interval and P-value "< 0.05" were used to examine the association between dependent and independent variables.

Results
There were a total of 64 acute pancreatitis patients recorded in logbooks of medical, surgical wards and ICU; of which 54 patients' charts were retrieved. This comprised 0.23% of the total 27,525 emergency patients treated during the same period. 61% of the patients were males while the rest 39% were females. The age of the patients is in the range of 20-67 years with a mean age of 37.8± 4.8 years. The leading etiologies were alcohol (44.4%), gallstone (24%), and obesity 5.6%. In the remaining 22.2%, the cause was not identified. 87% of the patients were treated conservatively while the rest 13% underwent emergency laparotomy for unsettled diagnosis of acute abdomen. The mortality was 11.1%.

Conclusions
Acute pancreatitis is not uncommon in Addis Ababa, Ethiopia. Alcohol and Gall stone disease are the two leading causes. Public awareness regarding aetiology may reduce the incidence. Intensive care units should be strengthened to properly handle severe cases to reduce the mortality rate.

Keywords: acute pancreatitis, acute abdomen, obesity, gallstones, laparotomy, Ethiopia

Introduction

Acute pancreatitis (AP) is a common acute abdominal condition that may progress beyond the pancreas to cause multi-organ failure and subsequent death. Presentation ranges from a mild self-limiting condition which usually responds to conservative management, to one with significant morbidity and mortality in its most severe forms. It is typically sudden in onset and most commonly encountered in its mild form. It is one of the commonly encountered acute abdominal emergencies which represents 0.15-1.5% of all diagnoses in the emergency room (1). AP caused approximately 275,000 hospitalizations in 2009 and was one of the most frequent gastrointestinal causes of hospital admission in US. Although its prevalence varies in different countries and even in different areas of a given country, it is likely that its real prevalence ranges from 200-300 cases per year per million inhabitants [1, 2, and 3]. AP is a relatively common disease that affects about 300,000 patients per annum in America [4].Prevalence of acute pancreatitis shows large regional differences with rates varying from 10 to 80 per 100 000 inhabitants/year (5, 6). There are also substantial geographical differences, low in the Netherlands (7) and UK, and higher rates in the Nordic countries (8) and in USA (9).A rising trend in the prevalence has been recognized over

the past several decades (10). Worldwide, the prevalence of AP ranges between 5 and 80 per 100,000 populations, with the highest incidence recorded in the United States and Finland. In Luneburg, Germany, the incidence is 17.5 cases per 100,000 people per year (11). In 2005, more than 230,000 patients were treated for acute pancreatitis in hospitals in the United States (12).

The hospitalization rates of patient with AP per 100,000 populations are 3 times higher for blacks than whites. The risk for African Americans aged 35-64 years is 10 times higher than for any other group (13). In study done in Bergen, Norway, acute pancreatitis had an estimated incidence of 30.6 per 100 000, and an annual incidence of 20/100 000 for a first attack (14). In a study done in South African regional hospital, 1% of total admissions to the general surgical wards were AP (15). Acute pancreatitis runs a benign course in Asian countries and the etiology is different from that of the western population (16).

Gall stones and alcohol abuse account for 70% of cases of acute pancreatitis. The most common cause of acute pancreatitis is gallstones, including microlithiasis, which accounts for 35 to 40% of cases of AP but only 3 to 7% of all patients with gall stones developing pancreatitis (17). In Europe and other developed nations, such as Hong Kong, more patients tend to have gallstone pancreatitis, whereas in United States, alcoholic pancreatitis is most common (18).

The diagnosis of mild disease may be missed and death may occur before diagnosis in 10% of patients with severe disease. In US AP mortality is about 7% and it is mild and resolves by itself without serious complications in 80% of patients, but when it is severe, it has complications and a substantial mortality in up to 20% of patients despite the aggressive intervention (4). The risk of death increases with age, co-morbidities, and severe disease. In recent meta-analysis, the risk of death was highest among patients with two organ failure and infected necrosis (11).The overall mortality in patients with AP is 10-15%. Most deaths occur in the first week of illness due to multiorgan system failure. In subsequent weeks, infection plays a more significant role, but organ failure still constitutes a major cause of mortality (12).

Little is known as to the incidence of acute pancreatitis in our country. The objective of this study is to assess the incidence, risk factors and evaluate the treatment outcome of AP in one of the tertiary hospitals in Addis Ababa, Ethiopia.

Methods

This study was conducted in Menelik II referral hospital, Addis Ababa, Ethiopia. Menelik II referral hospital is a general hospital rendering multifunctional services with a total bed number of 290 of which 96 beds are dedicated to surgery. This is a four–year (Sept 1, 2012- August 31, 2016) cross sectional retrospective study conducted on adult and adolescent (age >14 years) patients admitted to surgical, medical wards and ICU of the hospital. The daily admission log book registry was used to retrieve patients' cards.

All cases admitted to emergency unit, medical ward and surgical ward with a diagnosis of AP in the study period having reasonably adequate record were considered eligible for inclusion while all patients under 15 years of age and those patients with inadequate record were excluded from the study. The collected data was checked for its completeness, accuracy, clarity and consistency before entering into data entry forms. Ambiguity or incompleteness encountered was recorded and corrected immediately before proceeding to the next. The questionnaire was pre-tested among AP patients record before the study period that are not included in the actual study and ambiguity and vagueness has been corrected.

The data entered to SPSS version 20 computer software package and analyzed using, frequency distributions and percentage to determine prevalence, etiology and outcome of AP by cross tabulation with each independent variable. Statistical significance test was applied to see the association between different variables and,"95%" confident interval and P-value "< 0.05" were used to examine the association between dependent and independent variables.

Operational definitions

Acute pancreatitis – the diagnosis of AP was established by the presence of 2 of the following criteria: (i) abdominal pain consistent with the disease, (ii) serum amylase and / or lipase greater than three times the upper limit of normal, and / or (iii) characteristic findings from abdominal imaging. **Definitions of severity of acute pancreatitis is according to revised Atlanta criteria (2013)**

Ethical considerations

Ethically, the study was cleared and an official letter was obtained from department of surgery, Tikur Anbessa Specialized Hospital and submitted to Menelik II hospital. Given that it is a retrospective study, informed consents were not asked. The study didn't require patient's name or any personal identification details thereby assuring confidentiality of the information and privacy of the patients.

Results

Sociodemographic background

During the study period a total of 27,525 emergency cases were seen out of which 64 patients had a diagnosis of AP accounting for 0.23%. Out of the 64 patients with the diagnosis of AP identified in the log books of medical, surgical wards and ICU only 54 charts were recovered for review giving retrieval rate of 84.4 % which makes the basis of this study. In the majority of the patients the diagnosis was reached based on the clinical evaluation and biochemical studies. Only 7(13%) patients were diagnosed intraoperatively where the diagnosis could not be settled on clinical ground. There were 33(61.9%) male and 21(38.1%) female patients with a male to female ratio of 1.6:1. The age ranged between 20 – 67 years with a mean age of 37.8 ± 4.8 years. Majority of the patients (66.6%) were between 20 – 40 years. Most (94.4%) of patients were from Addis Ababa, the capital city of the country (table 1).

Table 1. Demographic characteristics of AP patients admitted to Menelik II Referral Hospital, September 2012 – August 2016

Characteristics		n	%
Age, years)	15- 20	0	0%
	20-30	18	33.3%
	30 -40	18	33.3%
	40-50	8	14.8%
	50-60	6	11.2%
	>60	4	7.4%
	Total	54	100%
Sex	Male	33	61.1%
	Female	21	38.9%
	Total	54	100%

Table 2. AP admission each department with sex distribution

Admitted to	n		%	
	Male	**Female**	**Male**	**Female**
Surgical ward	19	12	35.2	22.2
Medical ward	5	7	9.2	13
ICU	9	2	16.7	3.7
Total	33	21	61.1	38.9

31 (57.4%) of AP patients were admitted to surgical wards; while the rest 12 (22.2%) and 11 (20.4%) patients were admitted to medical wards and ICU respectively (Table 2).

The Body mass index (BMI) was normal in 43(79.6%) patients while the other 9 (16.7%) were assessed to be obese. Only one patient was categorized to be morbidly obese. Another one patient was assessed to be underweight. Co morbid illness was recorded in 12.3% of the patients of whom 43.2 % had type II DM and 28.3% had either stage III or IV retroviral infection.

Factors associated with acute pancreatitis

As is shown on table 3, alcohol was identified as the etiologic factor in 44.4%, whereas biliary stone disease was responsible in 24%. Etiologic factor was not identified in the remaining 22.2%.Obesity was incriminated only in 5.6% of the cases. In 3.8% of the AP patients, it was multifactorial where combination of risk factors like gallstone, DM, chronic alcohol intake and obesity were identified. Therefore these patients were considered to have multiple risk factors.

Of the 98.1% of the patients whose amylase level was determined, 83.5% had levels three times more than normal value. Serum lipase was determined in 98.1 % of the patients of whom 72.2 % had significant (3X or more) elevation sug-

Table 3. Frequency of causes of AP at Menelik II Referral Hospital, September 2012–September 2016

Cause(s)	n	%
Alcohol	24	44.4
Gallstone	13	24.1
Idiopathic	12	22.2
Obesity	3	5.6
Multiple	2	3.8

gesting AP.

Of the 96.3 % of the patients whose liver function test (transaminases) was determined 46.3 % had normal value while 39 % had values 3 or more times elevated. The remaining 11.1% had values less than twice. And also 96.3% of AP patients had serum creatinine result, of which 74.1% patients had normal level and the rest 22.2% had elevated level.

Of the 98.1% of the patients who had abdominal ultrasound evaluation, 96.2% had abnormal findings like swollen pancreas, GB stone, pseudocyst, poor visualization of pancreas with peritonitis etc. Only 40.7% of patients had abdominal CT scan study where all of them had findings suggestive of AP.

The severity of AP was determined and found to be mild in 51.9 %, moderate in 31.5%, and severe in 16.9% of the patients (fig. 2). Accordingly, the duration of hospital stay was one day (16.7%), 2 days in 13%, 3days in 25.9% and more than 4 days in 44.4% of the patients. Except for 7 (13%) patients who were diagnosed to have AP intraoperatively, all the rest were treated conservatively.

Complications

As is shown on table 4, 63% of the patients had no complication while the rest 37% had either a localized or systemic inflammatory response. Pancreatic necrosis, acute kidney injury, acute respiratory distress syndrome, Pseudo cyst, sepsis and shock were the frequently encountered complications. The systemic complications were seen as multi organ failure in 30 % of the complicated cases.

Outcomes

Six (11.1%) patients died while 48(88.9%) recovered from their illness. All deaths are among severe AP patients indicating that severe AP is lethal (P value of 0.014). Six of the nine cases who were categorized under severe AP died giving a mortality rate of 66.7 % for this group of patients.66.7% percent of patients who died were in the age range of 30-40 years. Majority of the mortality (83.3%) was seen in alcohol induced AP patients , which implies the odd of mortality of alcoholic patients is 10 times greater than the others with p value of 0.042 and 95% CI(1.68 – 3 .0) (Table 5).

The risk of death increased with two or more organ failure and localized complications (P= 0.01). Moderate and mild disease was associated with low mortality. Moreover

Table 4. Outcome of AP patients in relation to cause

Type of complication		n	% (of complications)
Local (pancreatic)	Pseudocyst	**7**	**35**
	Necrosis	8	40
Systemic	Sepsis	6	30
Hematologic	Hemoconcentration	1	5
CVS	Shock	6	30
Pulmonary	Pleural effusion	1	5
	ARDS	7	35
	Total	8	40
Renal	AKI	9	40.9
GIT	Paralytic ileus	1	5

Table 5. Outcomes of AP patients in relation to cause

Cause(s)	Recovered		Died		Recovered %	Died %
	n	P-value	n	P-value		
Gallstone	13	0.19	0		24	0
Alcohol	19	0.08	5	0.042	35.2	9.3
Idiopathic	11	0.21	1	0.14	20.3	1.9
Obesity	3	0.57	0		5.6	0
Alcohol and gallstone	2	0.65	0		3.7	0
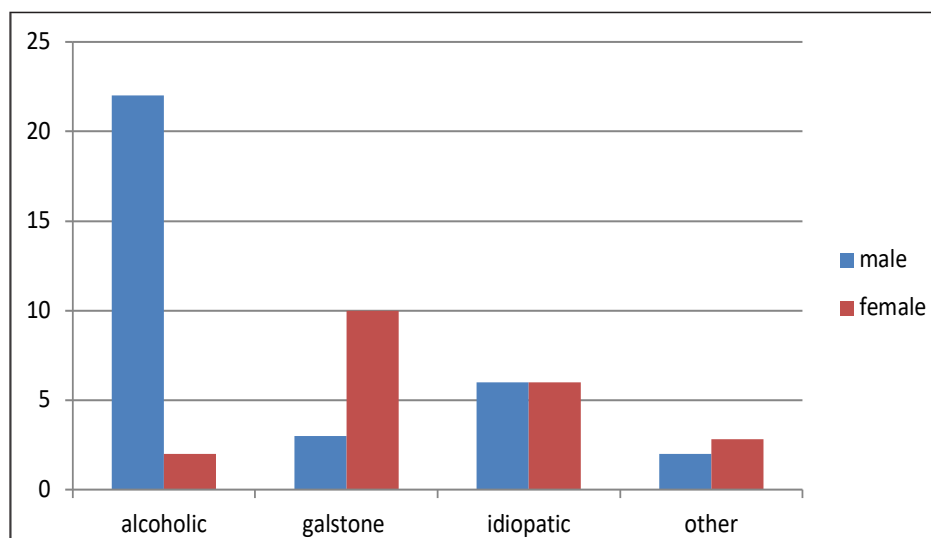
Figure 1. Causes of AP in the two genders at Menelik II Referral Hospital, Addis Ababa, Ethiopia, September 2012–August 2016
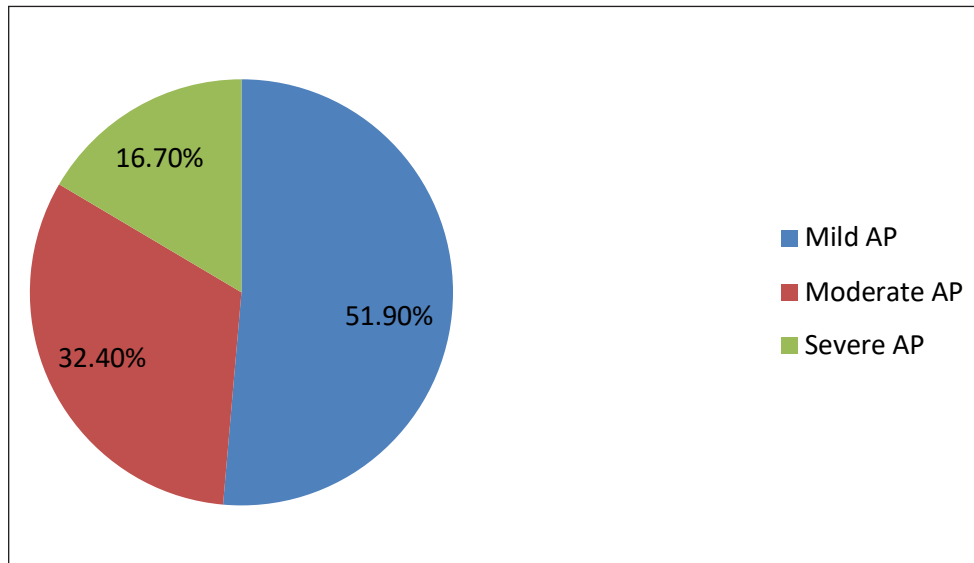
Figure 2. Severity of acute pancreatitis at Menelik II Referral Hospital, Addis Ababa, Ethiopia, September 2012–August 2016
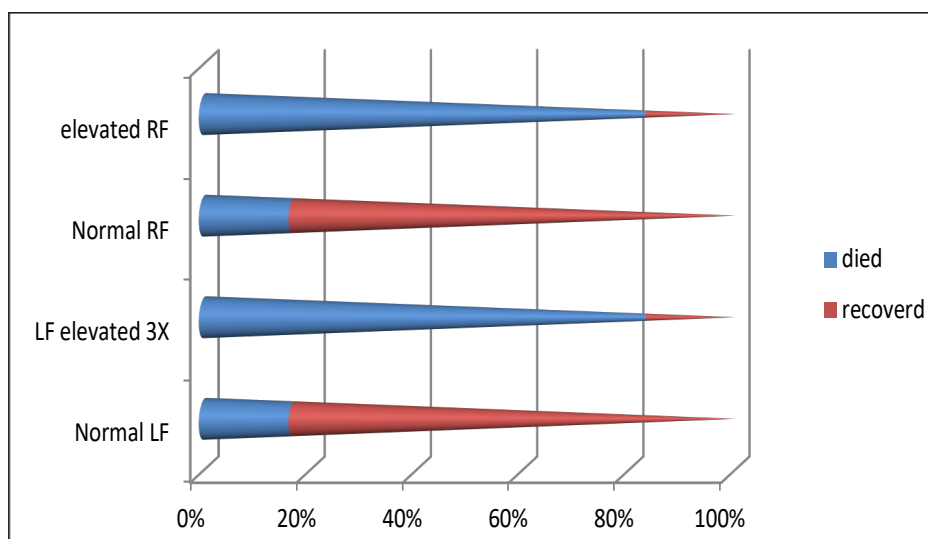

Figure 3. Outcomes in relation to renal and liver function

deranged Renal and Liver function were related with high mortality with P value of 0.05 and 0.015 respectively (figure 3).

The complication rates are mentioned in percentage and numbers on table 4.

Discussion

The result shows that the incidence of AP is 0.23% from all emergency cases which implies that it is not uncommon. This is almost similar to a study done in US which represents an incidence of 0.15-1.5% of all diagnoses in the emergency room. (1)

Alcohol and gall stone disease were the two leading etiologic agents contributing for 44.4% and 24% respectively that adds up to 68.4 % which is in agreement with Asian studies where the two accounted for 70%(17). Similarly studies from South Africa (15), US (18) and Nigeria (26) reported alcohol as a leading cause of AP. Lack of ERCP and bile analysis may have underestimated gall stone disease. Males were more commonly affected than females which may be explained by higher consumption of alcohol in men and it is unusual for Ethiopian women to indulge on alcohol due to cultural and traditional backgrounds. In general long standing alcohol consumption is common in male and on the other hand biliary stone disease is more common in

women. The etiology of AP was not known (idiopathic) in 22.2% which is almost similar to a study which showed 15 -20% of idiopathic causes AP (25). Those patients with idiopathic cause are mostly young patients in the age range of 20 – 30 years. Only 16.7% of the patients were documented to be obese which is in contradiction to a 47% report from Atlanta, USA (19). This difference may be explained by the low socio economic condition of our patients and the country at large. Only 9.2% of our patients had Diabetes Mellitus which is low compared to other study which reported in 37% of the cases (5).

In this series the patients are relatively young with a two times risk in the age group between 20 and 40 as opposed to other studies done on African Americans where the patients are relatively old with a tenfold risk in age group between 35 and 64 (13).

Based on the severity of the illness, ICU admission constituted for 20.4% which is in line with other study done in UK which shows approximately 25% of patient with AP developed severe disease and required admission to ICU (4). Almost sixty percent of the patients had mild AP and were discharged within 3 days of admission with advice to avoid high protein diet. This is comparable with a study done in India where an average duration of hospital stay was 3.9 days , however only 31.8% of their patients had mild AP (21). The lower incidence of mild AP in the Indian study may be due to a difference in the scoring systems used. They used ranson's Glasgow scoring and CT severity index to classify their patients).

The diagnosis of AP was ascertained intraoperatively in 7(13%) patients, which is high compared to a study done in Italy where 16 (2%) patients who underwent emergency laparotomy for acute abdomen were diagnosed to have AP intraoperatively (23) and low as compared to a study done in Nigeria where 86.7% of AP diagnosis was made at laparotomy for acute abdomen condition (26). The difference could be attributed to better preoperative assessment tool in the later set up.

Either systemic or local complications occurred in 37% of the cases which is in agreement with reports from Indian study that showed 43.4% complications (21) .The common complications which consisted of pancreatic necrosis, AKI, pancreatic pseudo cyst, ARDS, sepsis, and shock were in line with other study (21).30% of these complications occurred in a single patient as a multiorgan dysfunction syndrome. Complications occurred in those patients who presented late and had severe form of AP which is the case in other studies (24). Obviously these patients had prolonged Hospital stay (p= 0.03).

Out of the ICU admissions, 9 patients had severe AP and 2 patients had moderately severe AP.6 patients (11.1%) died which is very high compared to the study done in Taiwan where they had a mortality rate of only 1% (3). However it is comparable to a study done in USA with overall mortality of 7% and escalated to 20% in severe AP (4). All of the deaths are among severe AP patients, indicating the severity of the illness and poor outcome once it is severe (p= 0.014). (Ex-

planation: out of 9 severe AP patients 6 died and 3 of them had recovered, while all the moderate AP patients had recovered). This finding is similar to other study (24). Co morbidities were also risk factor for severity and poor outcome. Diabetes Mellitus was associated with poor outcome (p =0.04) which is also demonstrated in other study (5). Death was almost invariable in those patients with pancreatic necrosis and multi organ dysfunction which is also true in most studies (11, 12, and 20).

Limitations

This is a single facility based retrospective study with small sample size which may not represent the whole population of the country.

Conclusions and recommendations

This study has shown that AP is not uncommon in our set up and deserves due attention. Alcohol consumption has been shown to be the leading cause which should be communicated to the population using health education through public media. Delay in diagnosis should be avoided by being highly suspicious and do diagnostic investigations to settle the diagnosis and start appropriate management as early as possible. The mortality is high especially in severe AP which suggests for a need to have well organized and equipped ICU facility in hospitals to handle severe forms of AP. Further multicenter and prospective study should be performed to tell the magnitude of the problem and outcome of treatment in a well-designed manner.

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