

Pattern of Acute Abdomen in Dil Chora Referral Hospital, Eastern Ethiopia

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Abstract

Background: Acute abdomen is a commonly encountered illness both in developed and developing nations. But its relative incidence varies from place to place and among populations. Socio-economic status and diet are the factors for observed difference. Although the diagnoses associated with acute abdomen vary according to age and gender, analysis based on specific cause of acute abdomen is of great value for early diagnosis and prompt treatment in clinical practice.

Methods: This was a one year retrospective cross sectional study conducted at Dil Chora referral hospital in Dire-Dawa of eastern Ethiopia. Study population was patients presented to the hospital with acute abdominal emergencies. Samples were taken from all patients admitted with acute abdomen from October 1, 2011 to September 30, 2012. Data were collected with checklist and analysed by carrying out bivariate cross-tabulation, chi-square statistical test and logistic regression.

Results: The most common cause of acute abdomen was acute appendicitis followed by intestinal obstruction and gastro-duodenal ulcer perforation. Its' peak incidence was in age groups between 20 and 29 years. Acute abdomen mortality ratio was 10.9%. A statistical significance association was found between outcome of acute abdomen and duration of illness less than 2 days (AOR=3.89, 95% CI=1.094-13.84), age between 18-50 years old (AOR=5.06, 95% CI=1.327-19.349) and season of presentation from September–November (OR=3.6, 95% CI=1.296-10.108).

Conclusion and recommendation: Acute abdomen mortality ratio was found to be high. The leading causes were acute appendicitis and intestinal obstruction with gastro-duodenal ulcer perforation as a main fatal cause of acute abdomen. Regional health officials and health care providers should discuss the possible ways of reducing acute abdomen morbidity and mortality by creating awareness in the community by encourage early presentations of patients and good patient referral linkage and quality surgical service in order to reduce its associated impacts.

Keywords: Acute abdomen, Acute appendicitis, Intestinal obstruction, Ethiopia

Introduction

Acute abdomen is defined as an acute onset of abdominal disease entities that require immediate surgical intervention in most cases. It is a clinical condition characterized by severe abdominal pain, requiring the clinician to make an urgent therapeutic decision.¹

Abdominal pain is a common presentation to emergency departments.² Unlike chest, which seldom needs surgery, the abdomen often does.

In the developed world acute abdomen is most common in the age group 20 to 29 years with male predominance; acute appendicitis is the most common cause of surgical condition.¹ On the other hand in several African countries the leading cause of acute abdomen is intestinal obstruction. In turn, the leading causes of intestinal obstruction in Africans have mostly been hernia and volvulus whereas adhesions are most frequent in the developed world. There is however some African studies which are pointing to a change in these established patterns.³

The causes of acute abdomen are several and their relative incidence varies in different populations. Several factors are described to be responsible for these differences. Socio-economic factors and diet have mostly been blamed for the observed differences.³

As the study done in Tikur Anbesa and Gondar University Hospitals in Ethiopia showed, acute abdomen accounts for 36.4 % and 43.3 % of surgical emergencies respectively.^{3,4} Analysis based on specific cause of acute abdomen is of great value for early diagnosis and prompt treatment in clinical practice.⁵ So it is helpful to assess the local epidemiology in the diagnosis of abdominal pain; although the patterns will change over time.⁶

Analysing of pattern of acute abdomen has epidemiological and clinical benefits.⁶ It also helps for early diagnosis and prompt treatment. Patients with acute abdomen in Africa countries present late due to factors categorized as patients' factors and institutional inadequacies.⁷ Efforts to reduce delay may reduce complications. Surgery is often the only solution to prevent death from surgical cause of acute abdomen.

In Ethiopia very little is known about general pattern of acute abdomen, especially in Dire-Dawa where one of the risk factor, "khat" chewing, is commonly practiced in the area.^{3,5} However, as this study is institution based retrospective one, we couldn't get data to ascertain the relationship between khat chewing and acute abdomen. In order to provide effective and appropriate interventions, it is believed that information on dimension and context as well as the pattern and outcome of acute abdomen is crucial for hospital administrative, health officials and health care providers. This study was conducted with the aim of assessing the pattern and outcome of acute abdomen in Dil Chora referral hospital. Since the pattern of acute abdomen will change over time, the study will have epidemiological and clinical benefit and will serve as a base for other studies.

Methods

This Institutional based retrospective cross sectional study was conducted in Dil Chora Referral Hospital of Dire Dawa city in the eastern Ethiopia, on patients admitted with surgical acute abdomen from October 2011 to September 2012. The source population was all patients who were treated by a hospital during the period specified above. Then, 304 patient charts were collected by random method from all patients' charts who were admitted with acute abdomen for one year period. In order to keep data quality training was given for three nurses and three record office workers.

Ethical clearance was obtained from Institutional Review Board (IRB), College of Health and Medical Sciences of Haramaya University. Permission to proceed with the study was secured from the head of Dil Chora Hospital in Dire-Dawa. As this was a retrospective study, it was not possible to get consent of the individual patients. However, as clearly stipulated on the National Ethical Guideline and instructions given by IRB, it is the responsibility of the health facility (the hospital) to follow whether all

the ethical principles are fulfilled for such type of studies. As a result, informed verbal consent was also obtained from the director of the hospital. As the same time, for the sake of securing the confidentiality of patient's data, names and medical record numbers of patients were not specified during the data collection period.

Data were entered into SPSS version 16 statistical software packages for data analysis. Computer frequencies and summary statistics (such as mean, percentage, etc.) were used to describe the study population in relation to relevant variables. The degree of association between independent and dependent variables were assessed using odds ratio with 95% confidence interval. Variables that showed statistical significance in a bivariate analysis were put into a logistic regression model to identify those that determine acute abdomen outcomes.

Result

A total of 304 patient charts with acute abdomen were retrieved for analysis making a retrieval rate of 85% from the first estimated sample size. Due to incompleteness of the charts 15% of charts were excluded. Two hundred twenty eight (75%) of patients with acute abdomen were operated and 75(25%) patients were managed conservatively. About 60% of patients in this study were between 10 to 35 years old (Table 1).

The duration of illness at presentation ranged from 6 hours to 15 days. 169 (56%) presented with in 2 to 3 days duration of illness, 96 (31 %) presented with in less than 2 days duration of illness whereas 39 (13 %) patients presented after more than 3 days duration of illness. Seasonal distribution of patients diagnosed showed that large numbers of patients (38%), were presented in the season between September and November. Majority of the patients, 233 (77%), presented with signs and symptoms of vomiting where 26 (8.5%) with guarding (Figure 1). The major causes of acute abdomen in this study were acute appendicitis, 132 (43%), followed by intestinal obstruction 115 (38%) (Table 2).

Thirty three patients died making the mortality ratio of acute abdomen in this study 10.9% with male to female ratio of 5.6:1 and mortality ratio of patients with acute abdomen treated surgically was 13%. Of all patients died of acute abdomen, 28 (85%) were male. Sixteen (48.5%) patients who came from the city of Dire-Dawa and the rest, 17 (51.5%), who are living out of Dire-Dawa, had died of acute abdomen. The number of patients died with acute abdomen who presented for more than 3 days of duration of illness was 12 (Figure 2). The leading fatal causes of acute abdomen in this study were gastro-duodenal perforation which accounted for 50% of mortality ratio followed by intestinal obstruction (19%). On the other hand, acute appendicitis mortality ratio was less than 1%. The major causes of intestinal obstruction were small bowel volvulus (42%) followed by sigmoid volvulus (27%). Seasonally, the number of patients died from acute abdomen from December to February was 12 out of 63 admitted patients (Figure 3).

Crude analysis was done by a chi-square test to assess any association between the explanatory variables and outcome (acute abdomen, recovery or death) variable. Among these variables age category, residence, duration of illness and season were significantly associated with acute abdomen outcome at $P<0.05$. After running logistic regression to adjust for the impact of other variables, only duration of illness, age category and season were significantly associated with acute abdomen outcome ($P<0.05$).

Patients presented to hospital within less than two days of illness and within two to three days of illness had more improvement than patients presented after for more than three days of illness (AOR=3.89, 95% CI=1.094–13.84, $p=0.036$) and (AOR=12.12, 95%

CI=3.05–48.22, $p=0.00$) respectively. Even though the age groups (18–50) years were more affected by acute abdomen, patients in this age group had five times more improvement than older (greater than 50) years age groups (OR=5.06, 95% CI=1.327–19.349, $p=0.018$). More than one-third of patients with acute abdomen were admitted in the period of September to November but these patients improved 3.6 times more than the other patients admitted in the period of June to August (OR=3.6, 95% CI=1.296–10.108, $p=0.014$). On the other hand, much marked improvement was seen on patients admitted in the period of March to May (OR=4.2, 95% CI=1.398–12.441, $p=0.010$). Although it is not statistically significance, patients admitted in the period of December to February had twice better improvement than patients admitted in the period of June to August (Table 3).

Discussion

In developed world acute abdomen is more common between 18 to 50 years of age with most prevalent in the age groups 20 to 29 years with male predominance.² For instance in this study, about one-third (32%) of patients were in the age group 20 to 29 years with male predominance. Its morbidity male to female ratio was 2.5: 1 which is similar to the study done in Addis Ababa³ than studies done at Gonder university hospital and Pakistan in which male to female ratio were 3.2: 1 and 3.3: 1 respectively.^{3,8} This might be because females have easier access hospitals in Dire-Dawa similar to Addis Ababa than those in rural areas.

Acute abdomen was the most common surgical procedure in this hospital which accounts for 90% of all emergency abdominal operations. It was much higher than Tikur Anbesa and Gonder hospitals of Ethiopia which accounted for 36.4% and 43.3% respectively.^{3,4} This might be due to the presence of risk factors such as “khat” chewing [5]. The mortality ratio of acute abdomen (10.9%) in this study was lower than a study in Addis Ababa (15.3%).³ But slightly higher than a study in Gondar (9.3%).⁴ The higher mortality ratio in Addis Ababa may be due to late presentation of patients after they have developed a certain complication for those who were referred from far areas in to the capital city. On the other hand in this study the mortality ratio of patients with acute abdomen treated surgically was 13%. It is almost similar to the study done in southern Ethiopia (Yirgalem) and Tikur Anbesa Hospital in which 13.5% and 14% of patients died during and after surgery in these areas respectively.^{3,5}

One-third of patients were admitted during September to November. A similar study done in north-west Ethiopia showed that primary small intestinal volvulus vary among seasons and it reached to the highest during spring (September to November).⁹ Spring is a period where most crops are cultivated in Ethiopia and farmers perform hard manual work to harvest and cultivate crops in an erect posture. In addition, rapid filling of small intestine with large quantities of poorly digestible food containing cellulose and rich in cereals is also considered as the other reason for development of primary small intestinal volvulus.⁹

In this study, even though the incidence of acute abdomen was high (80%) in the age groups 18-50 years old, their improvement was five times better than older age groups (greater than 50 years) which is also statistically significant (AOR=5.068, 95% CI=1.327–19.349, $p=0.018$). This could be due to well-developed immunity at lower age groups and the occurrence of easily treatable cause of acute abdomen like acute appendicitis and small bowel volvulus.

The leading causes of acute abdomen in this study were acute appendicitis followed by intestinal obstruction which is similar to the study done in Tikur Anbesa Hospital.³ The leading cause of intestinal obstruction was small bowel volvulus (42%). It is also true in

Gonder University Hospital that accounted for 43.4%.⁴ But in Uganda and Rawanda the leading cause of intestinal obstruction was hernia which accounted for 40.2% and 39% respectively.^{10,11} This difference might be due to dietary habit and surgical service difference between Ethiopia, Rawanda and Uganda.

The most fatal cause of acute abdomen in this study was gastro-duodenal ulcer perforation, with a 50% mortality ratio. This is much higher than a study in Tanzania and Malawi in which their mortality ratio were 10.7%, and 33% respectively.^{12,13} The second was intestinal obstruction with a mortality ratio of 19%. This figure was also higher than a study in Rawanda and Uganda in which their mortality ratio were 6.7% and 12.9% respectively.^{10,14} This difference might be because of late presentation of patients and other risk factors for peptic ulcer complications such as “khat” chewing.⁵

Strength and Limitation of the Study

Now a day's most researches are focused on maternal and child health and as a result adult male morbidity and mortality issues are neglected. This study has therefore paramount importance by providing basic information and awareness about acute abdomen morbidity, risks, complications and its mortality in a country where little is known about the subject matter. However, as a main characteristic of secondary data sources and poor data management system in the hospital restricts the authors to including additional variable for further describing acute abdomen outcomes.

Conclusion and Recommendation

Acute abdomen is a commonly encountered condition of surgical emergency. It is more common in productive age groups with male predominance. The leading cause of acute abdomen in this study was acute appendicitis specific to those living in Dire-Dawa city and for those who are out of Dire-Dawa intestinal obstruction was the main cause. The most fatal cause of acute abdomen was gastro-duodenal ulcer perforation disease. Age of the person, duration of the illness, and season were the risk factors for outcomes of acute abdomen. Patients who present early had more improvement than patients presented late. Regional health bureau together with the hospital should discuss and organize meetings or trainings for health extension workers in order to carry out health information dissemination for residences so that late presentation of patients will be reduced.

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Table 1: Age distribution of patients with Acute Abdomen at Dil Chora Referral Hospital, Eastern Ethiopia.

Age	Improved	Dead	Total
0-9	16	1	17
10-19	49	4	53
20-29	91	7	98
30-39	59	5	64
40-49	28	3	31
50-59	13	7	20
60-69	11	4	15

70–79	2	2	4
≥ 80	2	0	2

Table 2: Causes of acute abdomen and its mortality ratio for patients at Dil Chora Hospital, Eastern Ethiopia.

Causes of acute abdomen	Number patients	of Percent	Number of died patients	Percent
Acute Appendicitis	132	43.4	1	3
Intestinal Obstruction	115	37.8	22	67
Gastro-duodenal perforation	18	5.9	9	27
Peritonitis	17	5.6	1	3
Ectopic pregnancy	10	3.3	0	0
Ovarian torsion	4	1.3	0	0
Others	8	2.6	0	0

Table 3: Factors related with acute abdomen outcome at Dil Chora Hospital, Eastern Ethiopia.

Study variables	Improved	Die	Crude odds ratio (95% CI)	p-value	Adjusted odds ratio (95% CI)	P-value
<18	58	4	1.42(0.47–4.34)	0.538	0.99(0.32–3.17)	0.998
Age						
18-50	185	16	7.63(2.41–27.17)	0.002*	5.06(1.33–19.35)	0.018*
>50	28	13	1		1	
Sex						
Male	188	28	0.82(0.69–0.96)		0.43(0.15–1.3)	0.135
Female	183	5	2.02(0.88–4.66)	0.64		
Duration of illness						
<2 days	93	3	0.73(0.62–0.28)	0.00*	3.89(1.09–13.84)	

	2-3 days	151	18	0.27(0.12-0.62)	0.002*	12.1(3.05-48.22)	0.036*
	>3 days	27	12	1		1	
	Sept-Nov	114	6	3.62(1.29-10.11)	0.014*	3.6(1.3-10.11)	0.014*
Season	Dec-Feb	63	12	2.15(0.66-6.98)	0.202	2.2(0.66-6.98)	0.202
	Mar-May	53	6	4.17(1.4-12.44)	0.010*	4.2(1.4-12.44)	0.01*
	Jun-Aug	41	9	1		1	
	Dire-Dawa	185	16	2.3(1.10-4.74)		0.9(0.86-1.04)	
Residence	Out of Dire-Dawa				0.023*		0.27
		86	17	1		1	

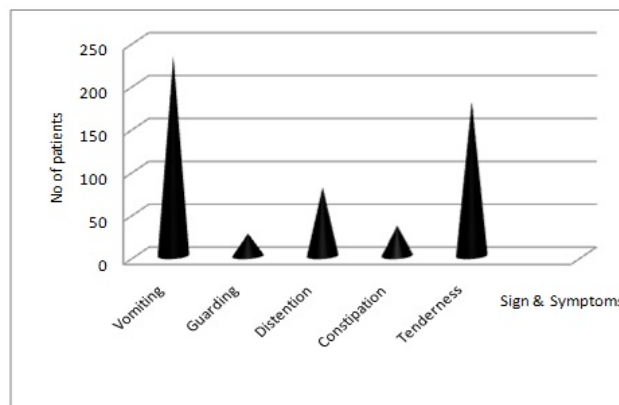


Figure 1: Sign and symptom of patients at Dil Chora Hospital, Eastern Ethiopia.

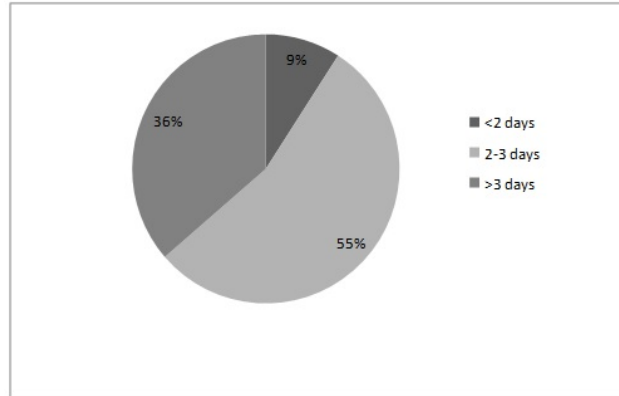


Figure 2: Dead patients with acute abdomen in different duration of illness at Dil Chora referral hospital, Eastern Ethiopia.

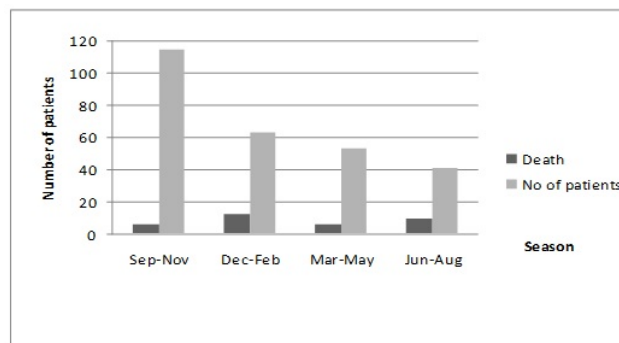


Figure 3: Deaths from acute abdomen at different Seasons in Dil Chora referral Hospital, Eastern Ethiopia.