



OUT COME OF EMERGENCY SURGICAL OPERATIONS PERFORMED FOR NON-TRAUMATIC ACUTE ABDOMEN AMONG ADULTS IN MEKELLE HOSPITAL, TIGRAY, ETHIOPIA, 2013

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ABSTRACT

Background: Acute abdomen is an acute onset of abdominal disease entities that require immediate surgical intervention in most of the cases. Non traumatic acute abdomen is a commonly encountered condition accounting for 36.4% of the surgical emergency, the overall mortality rate of 15.3% and post operative hospital mortality rate of 14%. wound infection, sepsis and pneumonia are the most common post operative complication and associated with long hospital stay. **Objective:** The aim of this study was to assess the outcome of emergency surgical operations performed for non-traumatic acute abdomen among adults in Mekelle hospital, Tigray, Ethiopia. **Methods:** A 3 years institutional based cross sectional study was conducted from secondary data. A total of 255 cases of non traumatic emergency surgical operations performed among adults in Mekelle hospital from September 2009 to August 2012. Check list was used to collect the data from the patient's card. The collected data were coded, edited, entered, cleaned and analyzed using SPSS version 16.0 for windows. Descriptive, Bivariate and multivariate methods were used to analyze the variables. **Result:** Among two hundred fifty five cases; the mean age was 36.7 years. Abdominal pain 255(100%) and vomiting 204 (80%) were the most frequent symptoms. One hundred two (40%) of the cases presented their complaint 1-2 days of symptoms and the most common pre operative and operative diagnosis of non traumatic acute abdomen were acute appendicitis 51.4%, and 50.2% respectively. Wound infection was the most common post-operative complication. The odds of post operative complication was higher among Patients older than 55 years (AOR: 3.218; 95% CI: 1.174, 8.818) as compared with relatively young age group 15-25 Years. Similarly, those Patients who were present more than 2 days; complaints were associated with post operative complication (AOR: 0.277; 95% CI: 0.107, 0.726) **Conclusion:** The proportions of post operative complication for non-traumatic emergency operations were lower. The most common pre and post operative diagnosis were acute appendicitis. Old age and duration of illness were associated with post operative complication. Additional efforts are needed to improve early presentation of symptoms by mobilizing Health extension workers, Women and community development army.

KEYWORDS: Non- traumatic emergency surgical operation, outcome, Mekelle.

INTRODUCTION

Acute abdomen is defined as a sudden onset abdominal disease condition which often requires an immediate surgical intervention and one of the commonly encountered emergencies in the practice of General surgery.^[1,2] The phrase acute abdomen is often deceiving in that many people believe the term is pathognomonic with surgical therapy. However, it should be noted that optimal therapy for many people who present with an acute abdomen often involves non-surgical management.^[3,4]

Non traumatic acute abdomen (NTAA) is a commonly encountered condition accounting for 36.4% of the surgical emergency, the overall mortality rate of 15.3%

and post operative hospital mortality rate of 14%. wound infection, sepsis and pneumonia are the most common post operative complication and associated with long hospital stay.^[5]

Intestinal obstruction has been the leading cause of acute abdomen in several African countries whereas acute appendicitis is the most frequently seen cause in the developed world. The leading causes of intestinal obstruction in Africans have mostly been hernia and volvulus whereas adhesions are most frequent in the developed world.^[6,7]

A study conducted in Saudi Arabia indicated that, NTAA was the most common cause for general surgical

admissions, accounting for 30% and 54% of total surgical and emergency surgical admissions respectively. Among these the most leading indications were acute appendicitis (47%), non-specific abdominal pain (19%), gallstone disease (11%) and intestinal obstruction (8%).^[4]

Study in Sina hospital shows that a total of 139 patients diagnosed with acute abdomen underwent emergency laparotomy and acute appendicitis was the most common cause of acute abdomen (56.8%).^[8] Acute appendicitis was the etiology of acute abdomen in 67% of male and 38.8% of female patients. Other common causes of acute abdomen were peritonitis (14.4%) among which 8(5.7%) resulted from PPUD, 5(3.5%) were perforated appendicitis, 2(1.4%) pancreatitis and 10(7.2%) cholecystitis. In addition to these, bowel obstruction 10(7.2%) of which 3(2.2%) adhesion and volvulus 2(1.4%) were found.^[8]

A study conducted in Nigeria indicated that; abdominal pain, vomiting and constipation were common symptoms, while abdominal distension and tenderness were common clinical findings. Small intestinal volvulus was encountered in 20 cases (14.1%) and associated with adhesion in 75% of the cases. Among those who do have volvulus 80% (12 patients) having gangrenous bowel segments. Adhesiolysis and intestinal resection were the commonest operative procedures. Common complications were wound infection in 16.2%, postoperative fever in 10.6% and chest infection in 9.1%. A mortality rate of 8.4% was recorded.^[9]

Among 324 patients who had Appendicectomy in Durban, South Africa the most common symptoms were abdominal pain (100%), vomiting (57.4%) and anorexia (49.0%). Generalized and localized abdominal tenderness were present in 62.0% and 19.4% of patients, respectively. Acute Appendiceal inflammation and gangrenous appendicitis was present in 36.1% and 9.6%, respectively. Postoperative complications included: wound sepsis (25.3%), prolonged ileus (6.2%), peritonitis (4.6%) and chest infection (3.4%). Four patients died (1.2%) all from the perforated group.^[10]

Study conducted in Addis Ababa, Tikur Anbessa hospital indicated that majority of cases were in their 2nd and 3rd decades of life. Small bowel obstruction due to adhesions and volvulus were the leading causes of intestinal obstruction each accounting for 27%. Perforated PUD was the 3rd most common cause of acute abdomen identified accounting for 21(9%) of cases, for which simple closure with omental patch was done.^[11]

A Study in Zaria, Nigeria indicates among 3, 717 patients 29.5% was emergency surgical admission. The most common diagnoses were appendicitis 996 (26.8%), nonspecific abdominal pain 871 (23.4%), intestinal obstruction 498 (13.4%). Appendicectomy 903(50.5%) was the most common operation, among the patients who

underwent Appendicectomy, 548 (60.7%) had an acutely inflamed Appendix (11).

A study done in Butajira, Ethiopia, indicates that among a total of 143 patients; Intestinal obstruction were the leading cause of acute abdomen 50 (34.9%), acute appendicitis the second common cause 35 (24.5%). Patients who presented early and immediate corrective measures were instituted had better outcome while those seen late developed unfavorable out-come with significantly higher complications.^[12]

In Ethiopia, very little is known about the outcome of emergency surgical operations. So, the purpose of this paper was to assess the outcome of emergency surgical operations performed for non-traumatic acute abdomen among adults in Mekelle hospital, Tigray, Ethiopia.

Therefore, the result of this study will serve as a baseline for policy makers, advisors, educators, clinicians, researchers and other concerned bodies.

METHODS

Study area

The study was conducted in Mekelle Hospital which is found in Tigray region; about 783km from the capital of Ethiopia, Addis Ababa. According to town administrative recent statistical data, the city had total catchment area of 19,000 hectare with total population 253,481 in 2011 (projection from 2009). There were also 4 private hospitals, 1 Referral University Hospital, 1 regional hospital (Mekelle Hospital), 6 health centers and 14 private clinics in the town. Mekelle hospital is a regional hospital with two major operating theatres and multidisciplinary professionals and residences around serving for about 800,000 peoples. A new Fistula Hospital which is the branch of Addis Ababa Fistula Hospital with well equipped operating theatre is also in the hospital ground.

The study was conducted from September 2009-August 2012.

Study design, population and sampling

An institution based cross sectional study was conducted. All adult patients admitted to surgical ward with the diagnosis of non traumatic acute abdomen during the year September 2009-August 2012 were included and the total sample was 255 operated non traumatic emergency surgical illnesses during the study period.

Data collection tool and procedure

The tool is prepared by reviewing relevant literatures. The check list was prepared to collect data concerning socio-demographic characteristics, duration of illness, presenting symptoms and signs, pre operative, operative findings and postoperative complications. The questionnaire was extracted and filled by the trained health care provider.

Data quality control

To maintain the quality of the data training was given for both supervisor and data collectors for one day by the investigators about the confidentiality of the information and how to extract the data from registration book.

Data with incomplete information was checked at spot before running the analysis. Pretest was done to check completeness of the data in the registration book and the pretest was done in other hospital.

Data management and Analysis

The data was coded, entered, cleaned and analyzed using SPSS version 16.0 software for windows. Descriptive analysis was done to describe the study population. Frequencies, measures of central tendency and dispersion were used as appropriate. Binary logistic regression was used to test the significance of associations between predictor variables and the outcome variable. Odds ratio with 95% CI was calculated. All variables that have association on bivariate analysis were considered for

inclusion in the multivariate analysis. Multivariate logistic regression was used to control the possible confounding effect of selected variables and to determine the independent predictors. Statistical significance was declared at $P \leq 0.005$. Finally the results were presented in text, tables and graphs and interpreted accordingly.

Ethical consideration

Ethical clearance was secured from Tigray regional health bureau and from Mekelle hospital. Data was collected anonymously to ensure confidentiality. And also the extraction was done in the room where the cards originally kept.

RESULT**Socio-demographic Characteristics**

A total of 255 adult non-traumatic emergency surgical operations were performed. Out of these about 196 (77%) were male and 59 (23%) were female, with the mean age of 36.7 years (± 1.7 SD). (Table 1).

Table 1: Socio demographic characteristics non traumatic surgical operations among adults in Mekelle hospital, from September, 2009- 2012

Variable	Category	Frequency	Percentage
Age	15-25	88 %	34.5 %
	26-35	63 %	24.7 %
	36-45	34 %	13.3 %
	46-55	22 %	8.6 %
	>55	48 %	18.8 %
Sex	Male	196 %	76.9 %
	Female	59 %	23.1 %
Address	Urban	163 %	63.9 %
	Rural	92 %	36.1 %

Sign and symptoms of non traumatic surgical operations among adults

Abdominal pain and vomiting were the most frequent symptoms 255(100%), 204 (80%) respectively. Ninety-seven (38%) had constipation and nausea, 105 (41.2%) had abdominal distension and 196(76.9%) had tenderness. Anorexia, rebound tenderness and guarding and rigidity consists of 85 (33.3%), 79 (31%) and 19 (7.5) respectively. The mean duration of illness was 1.9 days (± 0.76 SD) with 102(40%) of the patients presented within 1-2 days complaint. Ninety three (36.5%) of the patients had less than 24 hours duration of presenting complaint and sixty of them were presented >2days (23.5%).

Pre-operative diagnosis of non-traumatic surgical operations

Pre-operative diagnosis of acute appendicitis accounts 131(51.4%), one hundred eleven (84.7%) of them were from urban and ninety-nine of them were male (75.6%) followed by small and large bowel obstruction which accounts 52(20.4%) each. Out of the intestinal obstruction thirty nine(75%)were male ,thirty seven(71.2%) were from rural and forty-five(86.5%)were male, thirty two(61.5%) of them were from rural for SBO and LBO respectively.

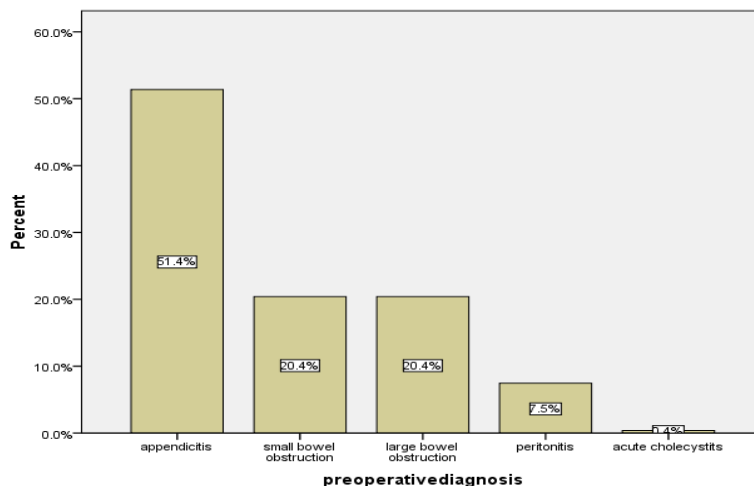


Figure 1: Preoperative diagnosis of non traumatic surgical operations among adult patients in Mekelle Hospital, September, 2009-2012.

As is shown on **figure 2**, the most common cause of non-traumatic acute abdomen was acute appendicitis 128(50.2%) the diagnosis was accurate for 97.7% of cases. One hundred ten (86%) of them were urban residents. Which is followed by intestinal obstructions (small bowel obstruction 58(22.7%) and 44 (75.9%) were male. Of those whose addresses were identified 41(70.7%) were from rural. Large bowel obstruction 47(18.4%), 40 (85%) of them were male patients most of them 29(61.7%) were from rural area., and peritonitis

accounts 20(7.8%). The diagnosis was true for 90.6%, 97.7% and 95.2% for small bowel obstruction, large bowel obstruction and peritonitis respectively. Acute appendicitis accounted for just over half of the cases 128 (50.2%). The most common type of appendicitis was Phlegmonous which account for greater than 82(64%). And the majority of the cases, 88(34.5%) were in the age group of 15-25years. Highest surgical procedure was Appendicectomy 112(43.9%) followed by primary resection end to end anastomosis 33(12.9%).

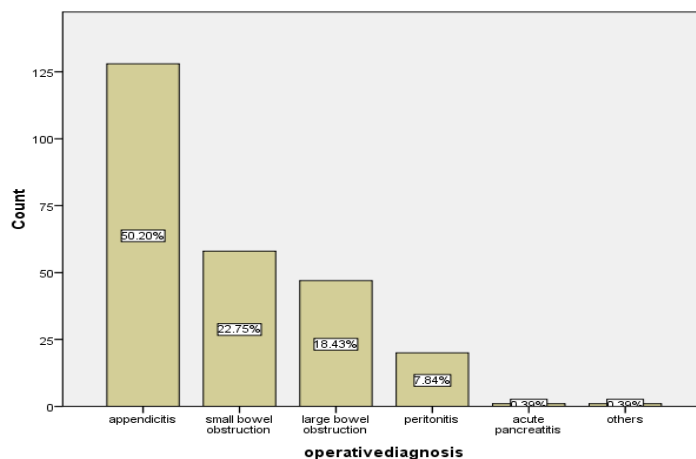


Figure2: type of operative findings among non traumatic surgical operations of adult cases in Mekelle hospital, September, 2009-2012.

Types of procedures performed for non traumatic acute abdomen among adults

Among all types of procedures performed for non traumatic acute abdomen Appendectomy 112 (43.9%) was the largest procedure performed among adult population which is followed by primary resection end to end anastomosis 33 (12.9%), laparotomy and derotation 30 (11.8%) and resection and Hartmann’s colostomy 21 (8.2%).

Types of operative diagnosis and post-operative complications

From the total 255 emergency operation for non traumatic acute abdomen forty-three (16.9%) patient were developed postoperative complications. And out of 128 cases of appendicitis 14 (10.9%) patients developed post operative complications and out of the 47 cases of large bowel obstruction 14(29.8%) were complicated post-operatively followed by small bowel obstruction accounts 9 (15.5%) patients (**Table 2**).

Table 2: Types of operative diagnosis and post-operative complications of non-traumatic surgical operations among adult patients in Mekelle hospital, September, 2009-2012.

Operative diagnosis	Post operative complications		Total
	Yes	No	
Appendicitis	14 (32.6%)	114 (53.8%)	128 (50.2%)
small bowel obstruction	9 (20.9 %)	49 (23.1 %)	58 (22.7%)
large bowel obstruction	14 (32.6 %)	33 (15.6 %)	47 (18.4%)
Peritonitis	5 (11.6 %)	15 (7.1%)	20 (7.8%)
acute pancreatitis	1 (2.3%)	0 (.0%)	1 (.4%)
Others	0 (.0%)	1 (.5%)	1 (.4%)
Total	43 (100.0%)	212 (100.0%)	255 (100.0%)

The most common complication was wound infection 21(8.2%). out of them 7(33.3%) presented within 1-2 days, 8 (38.1%) presented >2days and it was common in the 2nd and 3rd decade of life followed by death and sepsis 6 (2.4%), 8(2.4%) %respectively). It is followed by sepsis 8 (3.1%), Pneumonia 5 (2%) and death 6 (2.4%).

Factors associated with outcome of emergency surgical operation performed for non traumatic acute abdomen among adult

In the bivariate analysis age, sex and duration of illness were considered with $p < 0.2$ and only age and duration

of illness variable turn to be significant. During the multivariate analysis only age of the patient and duration of illness become the independent predictor of outcome of emergency surgical operation for non traumatic acute abdomen at $p < 0.05$.

The odds of post operative complication was higher among Patient >55 years (AOR: 3.218; 95% CI: 1.174, 8.818) as compared with relatively young age group (15-25yrs). Similarly, those Patients who were present >2 days complaint was associated with post operative complication (AOR: 0.277; 95% CI: 0.107, 0.726) (Table 3).

Table 3: Factors associated with outcome of emergency surgical operation performed for non traumatic acute abdomen among adult patients in Mekelle hospital, September, 2009-2012.

Variable	Postoperative complication		Crude OR (95% CI)	Adjusted OR (95%CI)	P-value
	Yes (%)	No (%)			
Age category					
15-25	8(18.6%)	80(37.7%)	1	1	
26-35	11(25.6%)	52(24.5%)	2.16(0.80,5.610)	1.80(0.66, 4.90)	
36-45	4(9.3%)	30(14.2%)	1.33 (0.37, 4.76)	0.79 (.202, 3.06)	
46-55	4(9.3%)	18(8.5%)	2.22 (.60, 8.19)	1.46 (0.37,5.73)	
>55	16(37.2%)		5.00(1.948, 12.832)	3.23(1.17,8.82) *	0.023
Duration of illness					
<1day	9(20.9%)	84(39.6%)	0.62 (0.26, 1.50)	0.42 (.27, 1.640)	
1-2days	15(34.9%)	87(41.0%)	1	1	
>2days	19(44.2%)	41(19.3%)	2.69(1.24, 5.82)	2.39 (1.04, 5.52) *	0.041

DISCUSSION

A total of 255 adult non-traumatic emergency surgical operations were performed. Out of these about 196 (77%) were male. The male to female ratio was 3:1 and majority of patients were in their 2nd and 3rd decades of life, which was broadly in line with previous study done in Tikur Anbesa Hospital which account 67% and Gondar university hospital 76.2% (1, 2). Abdominal pain was the most frequent symptom 255(100%), in this study which is congruent with study done in Sina hospital(Tehran, Iran), Aminu Kano Teaching Hospital, Kano Nigeria, Durban, South Africa, Tikur Anbesa Hospital and Gonder university hospital, 100% each(1,2,6, 8,10). Vomiting was the second most common symptom 204 (80%) in this study which is

broadly similar with studies done in Gondar (90.3%) and TAH (78%).

Forty-three (16.9%) patient were developed postoperative complications. The most common complication in this study was wound infection which accounts 8.2%. This finding is lower than studies done in Tikur anbesa teaching hospital (9.0%), Wesley Guild Hospital Nigeria (16.2%), Durban, South Africa (25.3%) and Sulaimany teaching hospital Iraq (10.08%) (1,9,5,10). This could be due to the strict implementation of infection prevention protocols.

Occurrences of death following operations were lower in this study (2.4%) in comparison with several studies in Gondar university hospital (9.3% and in Yirgalem

hospital (13.5%) (2,3). The possible reason might be due to the fact that the presence of well experienced surgeons and the difference in study period.

Age of the cases and duration of illness were statistically significant with post operative complication in this study. Post operative complication was higher among Patients >55 years old (AOR: 3.22; 95% CI: 1.17, 8.82) ($p=0.023$) as compared with relatively young age group (15-25yrs). Similarly, study done in Gondar university hospital older age was significantly associated with post operative complication (2) this might be due to the fact old age are more prone to complication due to their physiological change.

Patients who were present >2 days complaint was associated with post operative complication (AOR: 0.277; 95% CI: 0.107, 0.726) ($p=0.041$) this is congruent with the study done in Gondar university Hospital which was associated with increased occurrence post operative complications ($p=0.0395$) and TAH those who presented later than two days had a mortality rate of ($p<0.005$). This could be due to the complications that will result following late presentation.

Conclusion and Recommendation

CONCLUSION

The proportions of post operative complication for non-traumatic emergency operations were lower in this study. The pre operative and operative diagnosis was similar. The most common pre and post operative diagnosis of non-traumatic were acute appendicitis. Old age (>55yrs) and duration of illness greater than two days were factors statistically associated with post operative complication.

Recommendation

The researchers shall study the reason for late presentation to the institution for surgical treatment needs to be studied further. In addition to this further study shall consider additional variables which can affect the outcome.

Additional efforts are needed to improve for early presentation of the clients for early surgical treatment by mobilizing Health extension workers, Women and community development army.

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