CLINICAL EPIDEMIOLOGY, MANAGEMENT AND PREDICTORS OF OUTCOMES OF ADULT PATIENTS WITH NON-TRAUMATIC ACUTE ABDOMEN PRESENTING TO THE EMERGENCY MEDICINE DEPARTMENT OF MUHIMBILI NATIONAL HOSPITAL.

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MMed (Emergency Medicine) Dissertation
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MUHIMBILI UNIVERSITY OF HEALTH AND ALLIED SCIENCES
DEPARTMENT OF EMERGENCY MEDICINE

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By

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A Dissertation Submitted in Partial Fulfilment of the Requirement for the Degree of Master of Medicine in Emergency Medicine of

Muhimbili University of Health and Allied Sciences
October, 2018

CERTIFICATION

The undersigned certifies that she has read and hereby recommend for acceptance by Muhimbili University of Health and Allied Sciences a dissertation titled **"Clinical epidemiology, management and predictors of outcomes of adult patients with non-traumatic acute abdomen presenting to the emergency medicine department of Muhimbili National Hospital."** in (partial) fulfilment of the requirement for the degree of Masters of Medicine (Emergency Medicine) of Muhimbili University of Health and Allied Sciences.

_____

Hendry R. Sawe, MD, MMed, MBA

(Supervisor)

_____

Date

DECLARATION AND COPYRIGHT

I, **Kilalo Maeli Mjema**, declare that this **dissertation** is my original work and that it has not been presented and will not be presented to any other university for a similar or any other degree award.

Signature..... **Date**.....

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DEDICATION

To the beloved family; my mother, brother and sister-in-law for their love, prayers, guidance and encouragement over the years. Thank you for always being there in my triumphs and sorrows.

I would like to dedicate and express my deepest appreciation to my nephew, Joshua M. Yonazi who has been the light through my life, a break from all my work, my laughter and will power.

ABSTRACT

Background: Abdominal pain in adults represents a wide range of illnesses, from benign to life threatening conditions warranting immediate interventions. Emergency medicine as a new specialty provides an opportunity for early recognition and provision of appropriate treatment. However, the range of possibilities poses a unique challenge to emergency care providers particularly in low-income countries where there is general paucity of data on aetiology and outcomes for patients presenting to acute intake areas.

Aim: To describe the clinical profiles, management and outcomes of adult patients presenting with non-traumatic abdominal pain to the Emergency Medicine Department of Muhimbili National Hospital (EMD-MNH).

Methodology: This was a prospective cohort study of adult patients presenting to the EMD-MNH with non-traumatic abdominal pain. A case report form with inbuilt online data capture software was used to record data on demographics, clinical presentation, management, diagnosis and outcomes of patients. Data was summarized using descriptive statistics. Relative risks (RR) were ascertained to determine factors associated with mortality.

Results: A total 3381 adult patients presented at the EMD during the study period, 288 (8.5%) presented with abdominal pain, and of these 199 (69.1%) patients consented and were enrolled to our study. The median age was 47 years with IQR (35-60 years), 126 (63.3%) were female, and 118 (59.3%) were referral cases. Top EMD diagnoses were malignancies 67 (33.7%), intestinal obstruction 15 (7.5%) and UGIB 10 (5%) while final diagnosis were malignancies 71 (35.7%), intestinal obstruction 11 (5.5%) and PUD 9 (4.5%). Most common interventions given were intravenous fluids 57 (20.8%), analgesia 49 (24.6%) and antibiotics 40 (20.1%). There were 39 (19.6%) patients discharged, 160 (80.4%) admitted of which 15 (7.5%) underwent surgery directly from EMD. 24-hour and 7-day mortality were 4 (2.0%) and 7 (3.5%) respectively while overall in hospital-mortality was 16 (8.0%). Significant risk factors for mortality seen in this study included male patients Relative Risk (RR) 2.88 ($p = 0.03$), and ICU admission RR= 14 ($p < 0.0001$).

Conclusion & Recommendations: Abdominal pain is a common complain amongst adult patients presenting to the EMD-MNH. This presentation was associated with significant morbidity and mortality as evidenced by very high admission rate, need for surgical intervention and an in hospital-mortality rate of 8%. Future studies and quality improvement efforts should focus in identifying aetiologies, risks and appropriate interventions to optimize outcomes.

TABLE OF CONTENTS

CERTIFICATION i
DECLARATION AND COPYRIGHT ii
ACKNOWLEDGEMENTS iii
DEDICATION iv
LIST OF TABLES viii
Table 1: Demographic characteristics of adult patients presenting with abdominal pain viii
Table 2: Vital, associated symptoms and physical findings on abdominal examination. viii
Table 3: Investigations done viii
Table 4: Management given and consultation viii
Table 5: Top 10 ED provider diagnosis viii
Table 6: Disposition status and outcome viii
Table 7: Top 10 final diagnosis viii
Table 8: Risk factors associated with mortality viii
LIST OF FIGURES viii
Figure 1: Flow diagram of patients included in the study viii
LIST OF ABBREVIATIONS ix
DEFINITION OF KEY TERMS x
1.0 INTRODUCTION 1
1.1 Background 1
1.2 Literature Review 4
2.0 CONCEPTUAL FRAMEWORK 9
3.0 PROBLEM STATEMENT 10
4.0 RATIONALE 11
5.0 RESEARCH QUESTION 12
6.0 OBJECTIVES 13
7.0 METHODOLOGY 14
7.1 Study design 14
7.2 Study area: 14
7.3 Study population 14
7.3.1 Target population: 14
7.3.2 Accessible population: 14
7.3.3 Study population: 15
7.4 Sampling design: 15
7.5 Subjects 15
7.5.1 Inclusion criteria: 15
7.5.2 Exclusion criteria: 15
7.6 Variables of Interest: 15
7.6.1 Predictive variables 15
7.7 Sample size 17
7.8 Patient recruitment and data collection 18
7.9 Standardized data collection tool 18
7.10 Data analysis 19

7.11 Ethical consideration 19
7.12 Study limitations 20
7.13 Potential sources of error 20
7.14 Mitigation measures 20
8.0 RESULTS 21
8.1 Adult patients who presented with abdominal pain prospective cohort flow diagram 21
8.2 Demographics and clinical profiles 22
8.3 Vitals on presentation, associated symptoms and management given 23
8.4 Common emergency provider diagnosis, disposition and final diagnosis. 25
8.5 Risk factors associated with mortality 27
9.0 DISCUSSION 28
10.0 LIMITATIONS 31
11.0 CONCLUSION 32
12.0 RECOMMENDATIONS 33
REFERENCES 34
APPENDICES 37
APPENDIX I: CONSENT IN PARTICIPATING IN RESEARCH: ENGLISH VERSION 37
APPENDIX 2: CONSENT IN PARTICIPATING IN RESEARCH: SWAHILI VERSION 40

LIST OF TABLES

Table 1: Demographic characteristics of adult patients presenting with abdominal pain

Table 2: Vital, associated symptoms and physical findings on abdominal examination.

Table 3: Investigations done

Table 4: Management given and consultation

Table 5: Top 10 ED provider diagnosis

Table 6: Disposition status and outcome

Table 7: Top 10 final diagnosis

Table 8: Risk factors associated with mortality

LIST OF FIGURES

Figure 1: Flow diagram of patients included in the study

LIST OF ABBREVIATIONS

AIDS……. Acquired Immune Deficiency Syndrome

ALT ..... Alanine Transferase

AST ..... Aspartate Transferase

BS .....Blood Slide

CPL .....Central Processing Laboratory

CT KUB……..Computed Tomography Kidney-Ureter-Bladder

CT SCAN .....Computed Tomography Scan

ED/EMD ..... Emergency Department/ Emergency Medicine Department

FBP ..... Full Blood Picture

GBD…….Global Burden of Diseases

GCS .....Glasgow Coma Scale

HIC .....High Income Country

IQR…….Inter-quartile range

IRB .....Institutional Review Board

LIC .....Low Income Countries

MNH .....Muhimbili National Hospital

MRDT .....Malaria Rapid Diagnostic Test

MUHAS .....Muhimbili University of Health and Allied Sciences

PI…….....Principal Investigator

POC .....Point of Care

PUD……Peptic ulcer disease

RCT…….Randomized controlled trial

SPSS .....Statistical Package for Social Services

UGIB……Upper gastrointestinal bleeding

VBG/ABG..... Venous Blood Gas/Arterial Blood Gas

DEFINITION OF KEY TERMS

Acute abdomen is any serious acute intra-abdominal condition causing pain, tenderness and muscular rigidity for which there is a need for emergency surgery (1).

Appendicitis is the inflammation of the vestigial vermiform appendix (2).

Emergency Medicine is a medical specialty with the principal mission of rapid assessment followed by resuscitation, stabilization and management of critically ill and injured patients before they can be disposed to their definitive specialties for continuation of care (3)

Volvulus is the twisting of the intestine causing obstruction which may result in vascular compromise of the involved tissues (4)

1.0 INTRODUCTION

1.1 Background

Abdominal pain is one of the most important and challenging symptoms that brings a patient to the physician for evaluation. Abdominal pain represents a spectrum of diseases ranging from the most benign and self-limited to surgical emergencies (5,6). Acute abdomen is variably described by many sources; as any serious acute intra-abdominal condition causing pain, tenderness and muscular rigidity for which there is a need for emergency surgery (1), an intraabdominal process causing severe pain which requires surgical mediation (7), a medical emergency in which there is severe abdominal pain with varied accompanied symptom depending with the cause (5,6), abdominal pain of recent onset that needs urgent surgical procedures (8). Generally acute abdomen represents the rapid onset of symptoms that may indicate a life threatening intra-abdominal pathology that requires surgical interventions (9). Most times only a quarter of the patients with acute abdomen need surgical interventions, in such cases the dilemma remains whether surgery is needed emergently (10,11). Even with modern diagnostic tools and improved surgical skills older age and comorbid conditions pose a relatively higher morbidity and mortality (12).

Abdominal pain is one of the most common presentations to the emergency department. Different studies from high income countries reflect different ED burden; with 6.4% of the 100million ED patients visiting per year (13). Those with a varied etiology be it of a traumatic or non-traumatic origin accounting 7% - 10% posing diagnostic challenges for emergency clinicians (14). 5-10% of ED presentation with acute abdomen reflects the need for surgical interventions, consultation to surgeons and non-traumatic related visits. With high income countries, the variety in the conditions possess a great difficulty in the diagnosis of these conditions. At times even with extensive evaluation, almost a quarter of the patients remain without a specific diagnosis and get discharged from the ED while 35% - 41% of

similar patients presenting with abdominal pain get admitted (15). Increased risk is found in populations with comorbid conditions such as diabetes and those immunocompromised, children and the elderly such that there is about six to eight fold increase in the mortality in the elderly compared to younger patients and may present with vague symptoms that might be due to life threatening conditions such as aortic aneurysm amongst others (16).

Surgery is an essential component to a health system but it is not given a priority in the global public health (17). Significant deaths have been reported to occur in the emergency department from non-traumatic surgical conditions, accounting to 21% - 38% (18). Global health policies have not provided emergency medical services its desired priority especially in low and middle income countries such that access to optimal emergency surgical care is limited in many developing countries resulting in poor outcomes (18). Patients requiring surgical interventions also pose a great disease burden globally but in low and middle income countries the capacity to deal with these emergencies is inadequate with less than 1 operating theatre per 100,000 inhabitants in many low and middle income countries where some high income countries have more than 14 per 100,000 inhabitants (19).

Information about abdominal pain emergencies in low and middle income countries is limited; a study from low income countries reflected a 16.7% of patients with abdominal pain during a one month study were seen at Kenyatta National Hospital (19), however several other studies have looked at the surgical emergencies presentations as the need of surgical interventions keeps growing rapidly (13).

In Tanzania, the burden of ED presentation of non-traumatic acute abdomen is largely unknown. Lack of documented clinical profiles, presentations and outcomes poses a challenge to creating and meeting the standards of care. Health policies in the country contribute less to the emergency care and more to prevention of communicable diseases, reduction of maternal mortality and children under five. The growth of the emergency department in Tanzania reflects the need to invest in non-communicable diseases.

Muhimbili National Hospital is one of the very first emergency medicine departments in Tanzania that also serves as a national hospital to which patients are referred reflecting the diversity of conditions representative of the many regions within Tanzania. This descriptive study will describe the actual burden of acute abdomen in an acute intake care area in Tanzania and serve as a baseline for future studies for implementation of changes in practice and care delivery in the emergency department that can modify the outcomes of the patients.

1.2 Literature Review

Abdominal pain is representative of a spectrum of diseases which makes careful evaluation of patients important and requires the use of history, physical examination, laboratory tests and imaging studies (9,10). History alone reveals the source of abdominal pain 80-90% of the time for a skilled physician who must understand the pathogenesis of abdominal diseases (5). The pain may be in any quadrant, intermittent, sharp or dull aching, radiating or not and gives clues to the organs involved (9). Symptoms may be of sudden, rapid or gradual onset, symptoms of sudden onset happen in seconds and are mostly associated with perforations, rupture or infarction (5). Rapid onset symptoms progressively worsen in severity over seconds to minutes and can be related to cholecystitis, pancreatitis and intestinal obstruction, to mention a few, while gradual onset pain gets worse over hours or even days and is more likely related to neoplasms, subacute and chronic inflammatory processes and bowel obstructions (5). There are a variety of diagnostic tests that can be used both laboratory and imaging. Some of those are diagnostic while some are not, but can be used to monitor the patient's response to treatment for example white blood cells in complete blood counts are neither sensitive nor specific in the diagnosing abdominal pain but tend to be high in acute abdomen and decrease with treatment (20). Lipase is a marker of pancreatitis but it is not conclusive for pancreatitis if the amylase is normal since it can be related to renal insufficiency, malignant tumors, acute cholecystitis, and hypertriglyceridemia amongst others (21).

Comorbid conditions such as AIDS pose a challenge in diagnosing the etiology of abdominal pain since most of it is from opportunistic infections, ileus, organomegally such that laparotomy is not usually a necessity (22).

A retrospective chart review of patients with HIV presenting with abdominal pain was done to compare outcomes in those with advanced disease (CD4 <200/mm3) to those with early or middle stage of disease with a mean age of 37 +/- 7.6 years, mean CD4 counts of 263/mm3 (23). Common ailments included abdominal pain of unknown etiology,

gastroenteritis/diarrhea and ulcers with only 8% requiring intra-abdominal surgical procedures, 37% admitted reflecting how admission increases amongst these patients with a rate twice as much compared to the non-HIV infected population (23).

Analgesics are key in treatment as they relieve the patient with the discomfort of pain. There was a previous concern that the use of analgesics would interfere with physical examination finding and cause delays in diagnosis and treatment. However in a meta-analysis of RCTs for the use of opioids in patients presenting with acute abdominal pain the masking of abnormal physical examination was not sustained (24). Moreover advancement in diagnostic modalities, the use of pain medication is safe and has minimal impact on either diagnostic ability or surgical decision making (13).

Factors associated with poor outcome are varied and include acute onset of pain usually less than 48 hours, pain followed by vomiting, presence of guarding and rebound tenderness on physical examination, advanced age and prior surgical history (25). Mortality is seen to increase with ages above 60 years. Amongst the elderly, abdominal pain is a common presentation to the ED with a very atypical presentation that may harbor serious pathologies and the most lethal causes in this group includes mesenteric ischemia, abdominal aortic aneurysm and appendicitis (26). Other variables also related to bad outcomes such as death or the need of surgery includes hypotension, abnormalities in imaging studies, leukocytosis and abnormal bowel sounds (26).

The Global Burden of Disease studies evaluated causes and outcomes of 109 conditions estimating its morbidity and mortality and 11% of the diseases noted in GBD study needed to be treated surgically comprising of injuries (38%), malignancies (19%), congenital anomalies (9%), pregnancy complications (6%), cataracts (5%) and perinatal conditions (4%) (13).

In another study, most causes of death during surgery were from surgery of inoperable diseases (28%), ruptured abdominal aortic aneurysm (23%), perforated peptic ulcers (16%) and colonic resections (14%) (24).

There is a variation in etiology and outcomes depending on geographical distribution, age and comorbid conditions and several studies are representative of such facts. In high income countries, a two-year prospective study done in Saudi Arabia looking at the patterns of non-traumatic acute abdomen presenting in emergency general surgical admissions showed the need for emergency surgeries in (55%). There was a male predominance of 73% with a mean age of 27.6 years with acute appendicitis (47%) as a common diagnosis followed by non-specific abdominal pain (19%), gallstones (11%) and intestinal obstruction (8%). The length of stay increased significantly with age with a mean length of stay 6.6days (27). While in a prospective descriptive study in Nigeria, acute abdomen was responsible for 9.6% of surgical emergencies with patients aged 18-45 years making 78.3% of those seen from a range of 16-90 years (28). There was a male predominance of 71.4%, the most common presentation was abdominal pain (98.2%) followed by vomiting (68.5%), anorexia (56.9%) and fever while the most common ailments included appendicitis (30.3%) followed by intestinal obstruction (27.9%), perforated typhoid ileitis (14.9%) (28). Of all presentations 20% were on the same day as the onset of the symptoms, 51.8% within 3days and 78.3% by the seventh day of onset of symptoms. Causes of acute abdomen resulted in inflammatory ailments (34.1%), perforated bowels (29.7%), obstructive lesions (27.9%), hemorrhagic lesions (2.5%), biliary colic (1.3%) and non-specific abdominal pain (4.5%). Both of these studies reflected a common higher prevalence in males and appendicitis being the most common aetiology despite their geographical differences.

In Eastern Africa where studies are somewhat in close representation to Tanzania, a prospective descriptive study was done in Nairobi, it included patients 13 years and older seen in casualty department. There was 16.7% of patients presenting with abdominal pain during the study time (19). Laparotomy was done in 4.4% of its patients, with the incidence of ectopic pregnancy (65.3%) and acute appendicitis (16.3%) in the female population respectively while the incidence of malignancy found intra-operatively was 3.3% (19).

Evaluation of abdominal pain in the ED poses a great challenge due to the wide range of possibilities especially considering extremes of age and women in reproductive age, still poses great diagnostic challenge and potential complications (29) while some studies reflect 5.6% presentation to mention a few (30). Taking into consideration those titled with non-specific abdominal pain and discharged home some studies have shown that 7.9% return within a year time with similar complains and this time a specific diagnosis is reached in 24.1% of them common ailments being cholelithiasis (29.6%), appendicitis (18.5%) and gastrointestinal cancer (7.4%) while the remaining return home with a similar diagnosis from before (31).

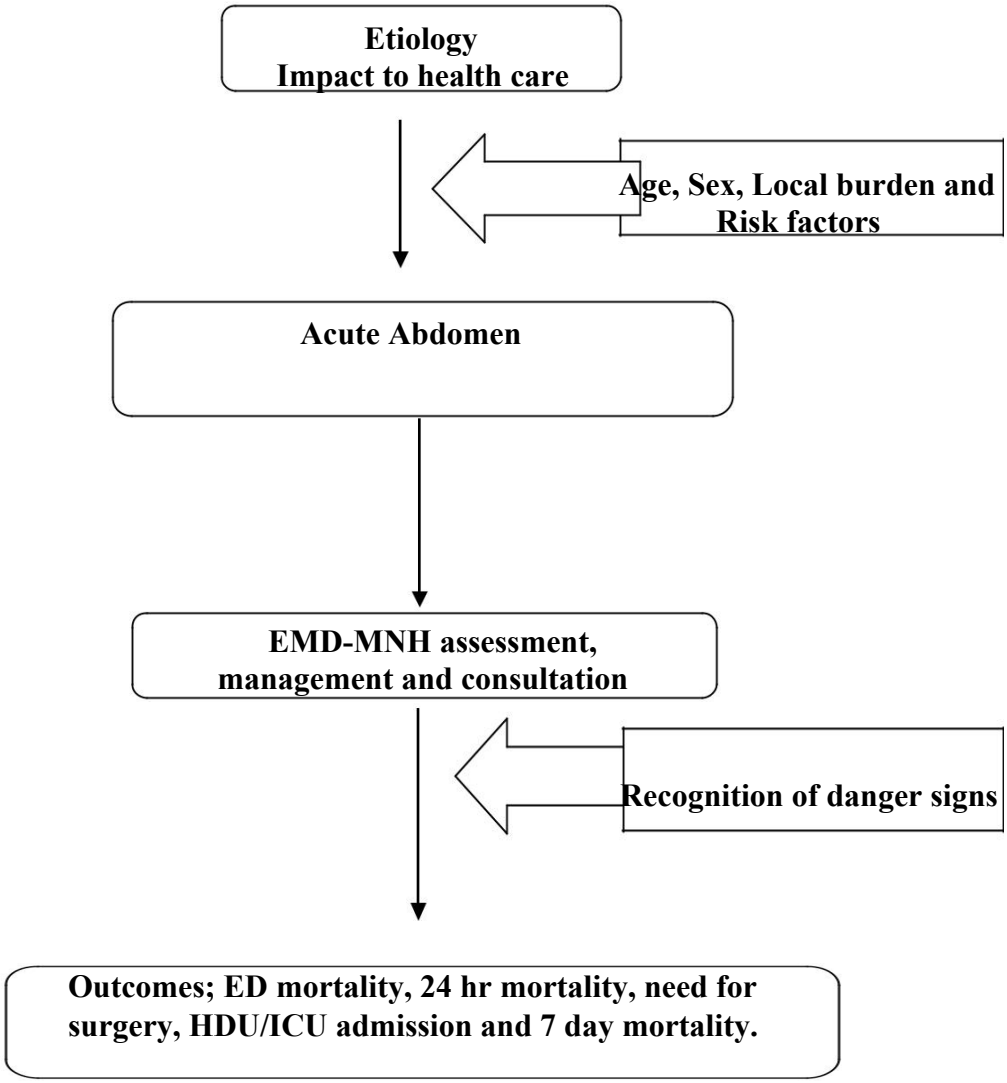
Mortality has been shown to increase in patients basing on the age, comorbid conditions, the need for surgical interventions, duration with which they stayed sick with the illness, these include populations with comorbid conditions such as diabetes and those immunocompromised, children and the elderly such that there is about six to eight fold increase in the mortality in the elderly compared to younger patients and may present with vague symptoms that might be due to life threatening conditions such as aortic aneurysm amongst others (17) .

Studies done in low income countries is limited and with most reflecting the need for surgical interventions. In Tanzania, where there is no documentation of the burden of abdominal pain in acute care settings and where the majority of its population cannot afford to get definitive tests such as abdominal CT, the diagnosis of conditions like appendicitis and other causes of acute abdomen is challenging. The clinical acumen of physicians to make the diagnosis is of great importance.

In Sub-Saharan Africa, acute care settings that are properly equipped to take care of the burden of those critically ill and injured are very few and yet emergency departments can have a high impact and be a cost effective form of secondary prevention (29). Acute abdominal pain remains a diagnostic challenge even today. Although computer-assisted diagnostic aids have been designed, these are not yet well established in clinical practice.

Thus, when facing this problem most physicians rely on experience and sound knowledge of the broad etiological spectrum of acute abdominal pain. In the first section of this presentation some practical issues are discussed with regard to basic diagnostic steps (history, clinical findings, laboratory tests, plain abdominal film and abdominal ultrasound), as seen from the internist's point of view. In the second part interdisciplinary management of complicated peptic ulcer disease, acute pancreatitis, acute diverticulitis, right lower quadrant pain, and spontaneous bacterial peritonitis are briefly outlined (29). Even with these challenges, the highest of all barriers remains lack thereof documentation of disease burden with the aim of improving emergency care and advocacy in primary prevention of diseases (32). There are very few sources if any on the aetiology of abdominal pain, without this knowledge it makes it difficult for public health sectors measures to be focused on how to prevent some diseases, allocate appropriate resources with respect to the burden of disease.

2.0 CONCEPTUAL FRAMEWORK



Conceptual Framework

This describes the flow matrix (conceptual framework) of this study and its impact to healthcare system.

3.0 PROBLEM STATEMENT

Abdominal pain is a common presentation to the ED amongst adults encompassing a variety of conditions ranging from a surgical, medical to obstetric and gynecological emergencies. Non-traumatic acute abdomen alone includes the most benign to life threatening conditions that require appropriate and early diagnostic approach through patient history, physical examination, laboratory tests and imaging studies then resuscitation and stabilization prior to offering definitive treatment (6,10). Global health policies have not provided emergency medical services with its desired priority especially in low and middle income countries such that the access to optimal emergency surgical care is limited (14). Geographical variation in the conditions prevalent will help emergency physicians to focus on the common aetiologies (33).

Almost a quarter of patients with acute abdomen need surgical interventions the only question remains is whether it is needed emergently (10,11). Even with modern diagnostic tools and improved surgical skills older age and comorbid conditions pose a higher morbidity and mortality (12). In low and middle income countries abdominal pain burden in the ED is still under documented (13). There is currently no data on clinical presentation, etiologies, risk factors associated and outcomes of adult patients presenting with abdominal pain to acute care settings in Tanzania (32). Without this knowledge, it makes it difficult for public health sectors measures to be focused on how to prevent some diseases, allocate appropriate resources with respect to the burden of disease.

4.0 RATIONALE

Doing this study will help us identify patterns in the etiology of acute abdomen in our country, improvement areas in the treatment protocols and allow us to determine what patient and treatment factors are associated with better outcomes. It will help us know the burden of non-traumatic acute abdomen in acute care settings of Tanzania, the need for surgery in these patients which may play an important role of improving our healthcare systems hence improving the care to the patients. Identifying the burden of disease in acute care settings of Tanzania will shed light to breech the barriers in appropriate care, provide us with an eye opener of what needs to be improved in our systems.

5.0 RESEARCH QUESTION

What is the clinical presentation, diagnostic evaluation, treatment and outcomes of adult patients presenting to the ED with non-traumatic acute abdomen?

6.0 OBJECTIVES

6.1 Broad objective

To describe the clinical profiles, management and predictors of outcomes of adult patients with non-traumatic acute abdomen presenting at the EMD MNH.

6.2 Specific objectives:

i. To determine the proportion of adult patients with non-traumatic acute abdomen presenting at the EMD MNH.

ii. To determine the clinical presentations and management of adult patients with non-traumatic acute abdomen presenting at the EMD MNH.

iii. To determine the most common emergency provider impressions, dispositions, outcome and final hospital diagnoses of adult patients with non-traumatic acute abdomen presenting at the EMD MNH.

iv. To determine the risk factors associated with mortality, need for surgical interventions, length of stay and need for HDU/ICU care for the adult patients with non-traumatic acute abdomen presenting at the EMD MNH.

7.0 METHODOLOGY

7.1 Study design

This was a prospective cohort study of all non-traumatic adult patients presenting to the EMD MNH with acute abdomen from August 2017– February 2017.

7.2 Study area:

This study was conducted at the EMD- MNH, Dar es Salaam which is situated in Ilala, one of the five districts of Dar es Salaam - Tanzania. MNH is a tertiary teaching hospital which serves as a National referral hospital with a bed capacity of 1500 beds with weekly admissions of around 1,000 to 1,200 patients (34). The EMD-MNH which was inaugurated in 2010 via partnership between Ministry of Health, Community Development, Gender, Elderly and Children (MoHCDGEC), MNH and The Abbott Fund Tanzania (AFT) receives all emergency referral cases (34). It sees an average of 200-250 patients per day of which 75% of its patients are adults.

7.3 Study population

7.3.1 Target population:

All adult patients with non-traumatic acute abdomen presenting in low resource acute care settings hospitals in Tanzania.

7.3.2 Accessible population:

All adult patients with non-traumatic acute abdomen presenting at the Emergency Department of Muhimbili National Hospital in Tanzania.

7.3.3 Study population:

Consecutive sampling of all patients with non-traumatic acute abdomen presenting at the Emergency Department of Muhimbili National Hospital in the presence of the research assistant from August – February 2017.

7.4 Sampling design:

Consecutive convenient sampling of all consenting adult patients as they present to the EMD MNH with non-traumatic acute abdomen from August – February 2017.

7.5 Subjects

7.5.1 Inclusion criteria:

All consenting adults aged 18 years and above presenting with non-traumatic acute abdominal pain, defined as presence of abdominal pain with any other clinical signs and symptoms such as abdominal distension, nausea, vomiting, diarrhoea, vaginal bleeding and amenorrhea.

7.5.2 Exclusion criteria:

Adults presenting with acute abdominal pain who develop cardiac arrest while in the ED before being enrolled in the study or those who discharge themselves against medical advice.

7.6 Variables of Interest:

7.6.1 Predictive variables

i. **Demographics**

Age

Sex

Duration of illness

Referral or not

ii. Clinical presentation

Associated symptoms that the patient had apart from the abdominal pain such as fever, vomiting, cough.

Any accompanied co-morbidity such as hypertension, diabetes, HIV, malignancy or history of prior surgery.

Physical findings of the patients such as abdominal distension, tenderness, signs of peritonitis.

Vitals signs such as blood pressure, heart rate, respiratory rate, oxygen saturation, random blood sugar and temperature

iii. EMD management strategies (includes care that the patient received while at the EMD-MNH and depends on the discretion of the attending doctor)

IV fluids

Antibiotics

Analgesia

Antiemetic medication

Diagnostic workup: Ultrasound, laboratory, X-rays, Urine dipstick, pregnancy test

Consultation to other specialties such surgery/medical/gynecological according to the patient emergent condition

Any other additional management such as NGT placement, urethral catheterization.

iv. Provider's final diagnosis at the EMD

Outcome variables

i. Proportion of adults with non-traumatic acute abdomen presenting to the EMD-MNH

ii. Surgical versus non-surgical management of various causes of abdominal pain; if surgery then time to surgery

iii. Disposition from ED such as operating theatre, ICU, medical, gynecological or surgical wards.

iv. Mortality: at EMD, 24 hours and at 7 days and comparison of mortality in patients who did and did not undergo surgery.

v. Final hospital diagnosis as reported in the file or discharge summary

vi. Association of risk factors with outcomes of mortality, surgery and length of stay.

7.7 Sample size

The sample size of this study was be based on a recent study depicting the pattern and presentation of acute abdomen in a Nigerian teaching hospital with a proportion of 9.6% that needed surgical interventions (28). Being a low-income country just like Tanzania with none to very few studies on non-traumatic acute abdomen presentations in the ED this is the most closely related reference.

The sample size formula was extrapolated from the Designing Clinical Research Book, Third Edition on sample size calculations for Descriptive Study of Dichotomous Variables (34).

$$N = 4((Z\alpha^2 P (1-P))/W^2$$

Where:

N= sample size

Zα= standard normal deviation of 1.96 for a 95% confidence interval

P= proportion of ED presentation with abdominal pain of 9.6% that needed surgery.

W=the desired total width of the confidence interval of 0.1

Thus

$$N=4((1.96^2 x 0.096)(1-0.096))/0.1^2$$

$$N=133.36$$

Hence a sample size of 133

7.8 Patient recruitment and data collection

All adult patients presenting to the MNH-ED were screened by the principal investigator or trained research assistant for eligibility. The research assistants were medical students who had used the REDCap application in collection for previous studies. A pilot study of five days was conducted after training the research assistants for two days on the use of REDCap and screening of patients so as to assess the ease of use of this new tool and try to observe for any challenges that might arise within the five days of pilot data collection. There was alternation of day and night shift every day for the five days, each with a duration of 12hours so as to give a representation of all days of the week with different timings of the day.

Participants were enrolled in the study after meeting the inclusion criteria and consent was obtained. The principal investigator or research assistant, completed the data collection tool (REDCap version 7.2.2, Vanderbilt, Nashville, TN, USA -see appendix 14.3) by recording information gathered directly from interviewing the patient or caregiver while the vitals, management and ED diagnosis was taken from the Electronic Medical Record-Wellsoft Information Health System and JEEVA system to trace lab results ordered. Telephone numbers of the patient or caregiver were obtained for follow-up at 24 hours and 7 days while inpatient file records were traced to obtain the final discharge diagnosis.

The validity and reliability of the information gathered by the research assistants was cross-checked by the PI in a sample of patients from the electronic medical system on a regular basis.

7.9 Standardized data collection tool

Standardized questionnaire (see appendix 14.3) was used to collect information on;

Demographics; age, sex, date of presentation, telephone number of the informant.

Clinical presentation; history and physical examination findings.

EMD provisional diagnosis, management strategies and investigations.

Mortality at 24 hours and at 7 days.

Whether or not surgery was done and when

Final discharge diagnosis.

7.10 Data analysis

Collected data from REDCap (version 7.2.2, Vanderbilt, Nashville, TN, USA) was transferred into the Statistical Package for Social Science (SPSS) (version 22.0.0, IBM, LTD, North Carolina, USA). Mean and standard deviation were used for normally distributed data while median and interquartile range were calculated for non-parametric data. Proportion was used to obtain the prevalence of adult patients who presented with non-traumatic acute abdomen at the EMD during the study period and to describe the study population. Chi-squared (X^2) was used to compare outcomes among patients who underwent surgery versus medical cases. P values of <0.05 will be considered statistically significant. Relative risks were assessed, and percentages were used to summarize different data and results was presented in graphs and tables.

7.11 Ethical consideration

Ethical clearance was sought from Muhimbili University of Health and Allied Sciences' Institutional Review Board (MUHAS-IRB), and permission to collect data was obtained from relevant authorities at MUHAS and MNH. Patients or caretaker were required to consent prior to enrolment in the study by signing the consent form which was available in both English and Swahili languages. The data was given a structured numerical identification to hide patient's identity and stored in a computer with password known by researchers only while the written forms were kept in a safe locker accessed by researchers only.

7.12 Study limitations

This was a single centered study which may affect the generalizability of the results to other lower level hospitals in Tanzania and Africa at large.

Relying on the caretaker for patients who are not necessarily well informed to give appropriate history.

7.13 Potential sources of error

Missing information from the medical health record.

Un-documented results.

Missed patients

7.14 Mitigation measures

EMD-MNH receives referrals from all over Tanzania. Much effort was made to ensure consecutive sampling is done so as to maximize the inclusion of patients referred from different parts of Tanzania thus helping in greatly improving generalizability of results.

All the questionnaires were re-checked by the principal investigator to ensure correct information has been filled before data entry.

Doctors were encouraged to record results of the test(s) that they had performed, and appropriate documentation as needed.

8.0 RESULTS

8.1 Adult patients who presented with abdominal pain prospective cohort flow diagram

A total of 3381 adult patients presented to the ED, 288 (8.5%) presented with the complaint of abdominal pain out of which only 199 (69.1%) consented to participate in the study, 89 (30.9%) were missed, did not consent or meet the inclusion criteria. There was no loss to follow up. **(Figure 1)**

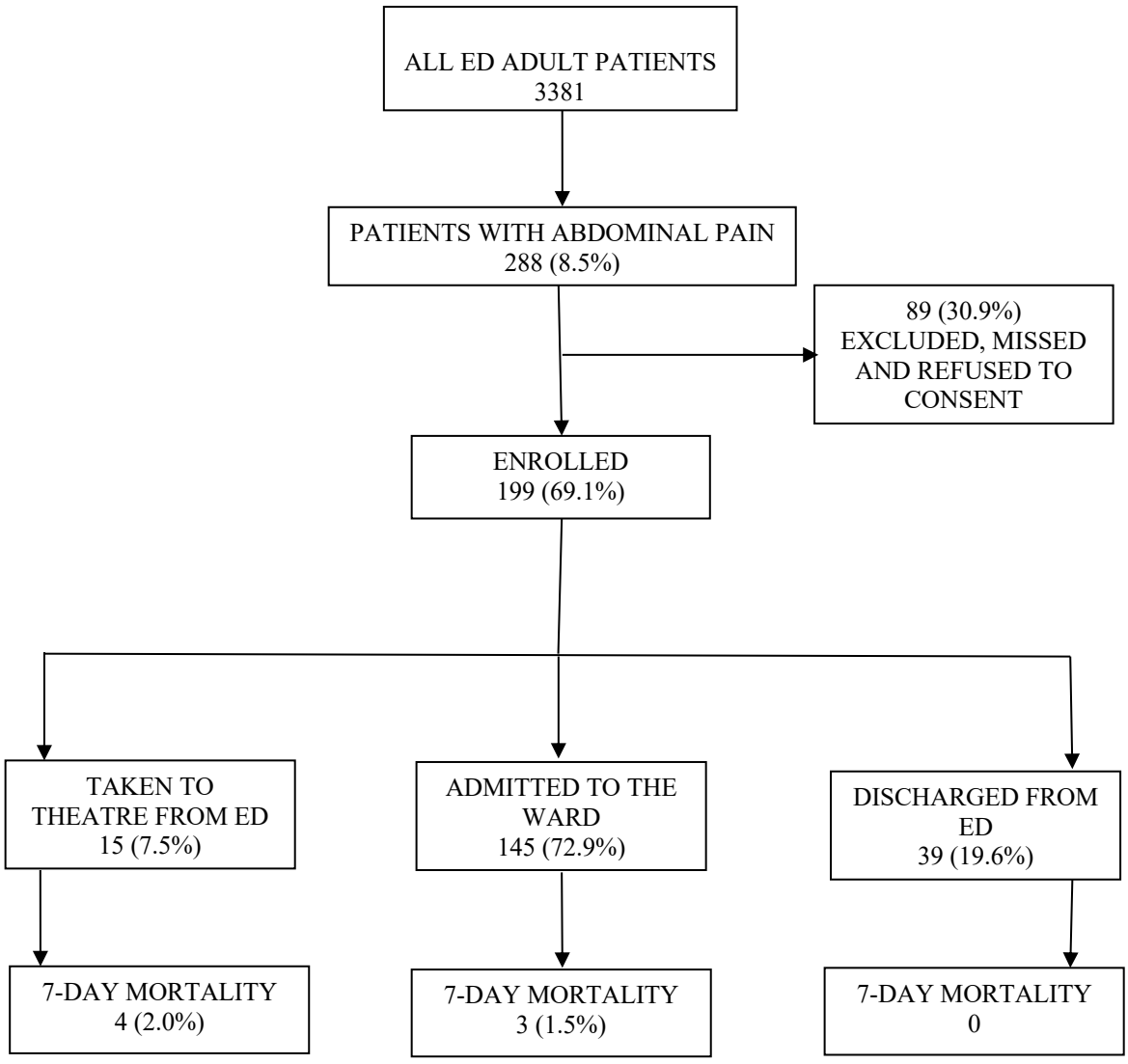


Figure 1: Flow diagram of patients included in the study

*1 patient died in the ED (0.5%)

8.2 Demographics and clinical profiles

Of the 199 patients enrolled, 126 (63.3%) were female and median age was 47 years with IQR of (35-60). The most common age group was 46-65 years (37.7%) and most of the patients presenting to the ED were referral cases 118 (59.3%). Male to female ratio was 2:1 and the median length of stay was 10.5 days. Comorbid conditions commonly reported were previous history of surgery 37 (18.6%), hypertension 30 (15.1%) and malignancy 18 (9%).**(Table 1)**

Table 1: Demographic characteristics of adult patients presenting with abdominal pain

Variable	**Overall N=199 n (%)**
Age in years in groups	
18-35	52 (26.1)
36-45	43 (21.6)
46-65	75 (37.7)
>65	29 (14.6)
Gender	
Male	73 (36.7)
Female	126 (63.3)
Referral status	
Self-referral	81 (40.7)
Referred	118 (59.3)
Comorbidities	
Previous history of surgery	37 (18.6)
Hypertension	30 (15.1)
Known malignancy	18 (9.0)
Diabetes	8 (4.0)
HIV	8 (4.0)

8.3 Vitals on presentation, associated symptoms and management given

Associated symptoms commonly seen with these patients included abdominal distension 46 (23.1%), vomiting 38 (19.1%) and constipation 25 (12.6%). Most of these patients were given IV fluids 57 (20.8%), analgesics 49 (24.6%) and antibiotics 40 (20.1). Most patients on examination had tenderness on examination 119 (59.8%) and distension (33.7%). Investigations of significance included RBG <3mmol/L 11 (5.5%), WBC <3 2 (1%), creatinine >120umol/L 32 (16.1%), abnormal abdominal X-ray 4(2%) and abnormal CT abdomen 2(1%). Management given included IV fluids 57 (20.8%), anaelgesics 49 (24.6%) and antibiotics 40 (20.1%). (**Table 2-4**)

Table 2: Vitals, associated symptoms and physical findings on abdominal examination

Variable	Frequency N	Percentage
Vitals on presentation		
MAP< 65mmHg	5	2.5
HR>100bpm	74	37.2
HR<60bpm	0	-
RR>22cpm	18	9.0
RR<10cpm	0	-
SPO2 <94 (%)	0	-
T>38^{0}C	1	0.5
T<36^{0}C	0	-
Clinical presentation		
Abdominal distension	46	23.1
Vomiting	38	19.1
Constipation	25	12.6
Diarrhoea	9	4.5
Fever	9	4.5
Physical findings		
Tenderness	119	59.8
Distension	67	33.7
Normal	46	23.1
Palpable mass	29	14.6
Guarding	6	3.0

Table 3: Investigations done

Variable	Frequency N (%)	Died N (%)	Relative risk	P value
POC investigations				
RBG<4mmol/L	11 (5.5)	4 (36.4)	5.70	0.0004
Laboratory investigations				
WBCs >11	13 (6.5)	0	0.40	0.5208
WBCs <4	9 (1.0)	2 (22.2)	3.02	0.1018
Hb <7g/Dl	17 (8.5)	2 (11.8)	1.53	0.5507
Lipase >200U/L	1 (0.5)	0	3.01	0.3762
Creatinine>120umol/L	32 (16.1)	9 (28.1)	6.71	0.0001
Imaging				
POC abdominal uss abnormal	18 (9.0)	1 (5.56)	0.67	0.6900
Abdominal Xray abnormal	4 (2.0)	2 (50)	6.96	0.0006
Abdominal uss abnormal	0	0	-	-
CT abdomen abnormal	2 (1.0)	1 (50)	6.57	0.0120

Table 4: Management given and consultation

Variable	Frequency N (%)	Died N (%)	Relative risk	P value
Management given				
IV fluids	57 (20.8)	9 (15.8)	3.20	0.0151
Anaelgesics	49 (24.6)	7 (14.3)	2.38	0.0686
Antibiotics	40 (20.1)	9 (22.5)	5.11	0.0005
Blood transfusion	27 (13.6)	3(11.1)	1.47	0.5250
Surgical consult	21 (10.6)	7 (33.3)	6.59	0.0001

8.4 Common emergency provider diagnosis, disposition and final diagnosis.

Common ED provider diagnosis included Malignancy 67 (33.7%), intestinal obstruction 15 (7.5%) and UGIB 10 (5%). Among the 199 patients, 39 (19.6%) were discharged home from the EMD, 70 (43.8%) were admitted to the surgical ward, 48 (30.4%) were admitted to medical ward and 40 (25.3%) were admitted to the OBGYN ward. 15 (7.5%) of patients had an operation at the EMD theatre before admission to the ward. Final diagnosis included malignancy 71 (35.7%), intestinal obstruction 11 (5.5%) and PUD 9 (4.5%). Only 1 patient died in the ED while the overall mortality was 16 (8.0%). (**Table 5-7**)

Table 5: Top 10 ED provided diagnosis

Variable	Frequency N	Percentage
Top 10 ED diagnosis		
Malignancy	67	33.7
Intestinal obstruction	15	7.5
UGIB	10	5.0
PUD	9	4.5
Liver cirrhosis	7	3.5
BPH	6	3.0
Incomplete abortion	6	3.0
Peritonitis	6	3.0
PID	4	2.0
Ovarian cyst	3	1.5

Table 6: Disposition status and outcome

Disposition	Overall n (%)	% (95 CI)
Discharged	39 (19.6)	19.6 (14.7-25.8)
Admitted	160 (80.4)	80.4 (74.3-85.3)
Theatre	15 (7.5)	7.5 (4.6-12.1)
Died ED	1 (0.5)	0.5 (0.09-2.8)
24hour mortality	4 (2.0)	2.01 (0.78-5.05)
7days mortality	7 (3.5)	3.5 (1.72-7.08)
Overall hospital mortality	16 (8.0)	8.0 (5.01-12.66)

Table 7: Top 10 final diagnosis

Variable	Frequency N	Percentage
Top 10 final diagnosis		
Malignancy	71	35.7
Intestinal obstruction	11	5.5
PUD	9	4.5
BPH	7	3.5
CKD	7	3.5
UGIB	6	3.0
Incomplete abortion	6	3.0
Peritonitis	6	3.0
Gastritis	6	3.0
PID	5	2.5

8.5 Risk factors associated with mortality

In relative risk analysis, significant factors associated with in-hospital mortality were being a male patient 73 (36.5%), tachypnea with RR>22cpm 18 (9%) and requirement for ICU admission 2 (1%). Male patients have 3 times the risk of dying when they present with abdominal pain. Tachypnea on presentation keeps the patient at three times the risk of dying while the need for ICU admission resulted in 14 times the risk of dying. (**Table 8**)

Table 8: Risk factors associated with mortality

Variable	**Total N= (%)**	**Died n= (%)**	**Relative risk 95% CI**	**p-value**
Age >65	29(14.6)	3(10.3)	1.35 (0.41-4.46)	0.6193
Male	73(36.7)	10(13.7)	2.88 (1.09-7.59)	0.0328
Referred	118(59.3)	11(9.3)	1.51(0.54-4.18)	0.4277
Comorbid conditions				
Previous surgery	37(18.6)	3(8.1)	0.10(0.03-0.35)	0.0003
Hypertension	30(15.1)	4(13.3)	1.88(0.65-5.44)	0.2453
Malignancy	18(9.0)	3(16.7)	2.32(0.73-7.39)	0.1543
Diabetes	8(4.0)	1(12.5)	1.59(0.24-10.61)	0.6310
HIV	8(4.0)	1(12.5)	1.59(0.24-10.61)	0.6310
Abnormal vitals				
MAP<65mmHg	5 (2.5)	1 (20)	2.58 (0.42-15.95)	0.3060
HR>100bpm	74 (37.2)	8 (10.8)	2.22 (0.80-6.14)	0.1257
RR>22cpm	18 (9.0)	4 (22.2)	3.35 (1.20-9.32)	0.0204
HDU/ICU admission	2 (1.0)	2 (100)	14.07 (8.49-23.31)	<0.0001
Length of stay >3days	80 (40.2)	7 (8.75)	1.16 (0.44-2.98)	0.7627

9.0 DISCUSSION

To the best of our knowledge, this is the first study within our setting to highlight the burden of acute abdominal pain within the EMD in East Africa. We found that 8.5% of the adult patients who presented to the EMD-MNH had abdominal pain. There is a lack of previous studies in Tanzania for patients with abdominal pain; the overall burden of abdominal pain and most common diagnoses had not been studied. The proportion we found in this study is within the same range as the one reported from HICs, which have reported a burden of 7%-10% (17).

In our study, two thirds of patients with abdominal pain were referred from other peripheral hospitals and the referral hospitals commonly were the municipal hospitals within Dar es salaam. The nature of the referral system may result in higher acuity in the patients that are seen in our EMD and may lead to these patients being seen by us further into their course of illness than is seen in many HICs.

The most common treatments received were intravenous fluids, analgesics and antibiotics from the EMD-MNH. Most of these patients commonly had associated symptoms such as abdominal distension, vomiting and constipation of which are the classical hallmarks in patients with intestinal obstruction amongst others. The findings are somewhat similar in studies in HICs where these symptoms commonly observed were vomiting anorexia and fever (31).

There is a high prevalence in the female population as compared to male which is different from the studies from HIC were there was a male predominance (31). This finding highlights the health seeking nature that is common by female population as compared to male with most of the culture of people in Tanzania.

The most frequent specific EMD providers' diagnoses in our study was intra-abdominal malignancy followed by intestinal obstruction and UGIB. This is somewhat surprising, as it is in contrast to similar studies done in Nigeria and Kenya were surgical emergencies such as

appendicitis and ectopic pregnancy were commonly found and to the least the causes were intra-abdominal malignancies (20,30). We believe that most of these patients present rather late, there is no routine screening for possible malignancies and intra-abdominal malignancies are a common presentation in most.

With respect to intra-abdominal malignancies amongst other causes of abdominal pain, the best means to pick such a diagnosis is through CT abdomen and many of the patients that came to our facility could not afford it lest they were insured. Such a test is also not available in majority of the health facilities out of Muhimbili National Hospital and hence the need of referral for further work up.

Furthermore, we believe the patient population in our study may have been largely influenced by the nature of the referrals MNH receives due to the presence of specialized surgical and oncologic services however the top referring hospitals have the capabilities of doing surgical interventions and hence the need to emphasize of strengthening these services from the municipal levels so that these patients receive surgical interventions as early as possible.

Two thirds of the patients with abdominal pain were admitted after evaluation at the EMD. This highlights the high acuity of illness in our cohort. This high acuity is also reflected in the in-hospital mortality rate of these patients were 8.0% of them died.

Of the 39 (19.6%) patients discharged, they remained alive and well on the 24 hours and 7 days follow up through phone calls. They were all reachable and none of them during the time of the study was seen again as readmissions. Majority of their ED diagnosis included conditions like, gastroenteritis, gastritis, peptic ulcer disease amongst others.

The observed factors that were associated with in-hospital mortality in our cohort were male patients, hypoglycemia with RBG <3mmol/L, tachypnea on presentation, need for surgery.

Similarly, for patients with low WBCs, raised creatinine and lipase levels had significant risks of dying. This is likely due to the culture of late seeking of medical treatment for the

male population in our country that leads to them presenting rather late and more acuity in illness.

The mortality rate increased significantly to 8.0% as a final outcome while that at 7 days was 3.5%. To the best of our knowledge, this is the first study to document this outcome of adult patients with acute abdominal pain in our setting and represents an area that requires further study since a significant number of patients died after their hospital stay.

Overall, our study showed that abdominal pain is a common presentation amongst patients presenting to the EMD-MNH, and that those patients have a high mortality rate. The disparity between the results in our setting and those in other settings highlights the opportunity for improvement in these outcomes through healthcare system improvement.

10.0 LIMITATIONS

i. This was a single center study, however EMD-MNH receives referral from all over the country hence efforts were made to ensure appropriate sampling was done so as to maximize the inclusion of patients referred from different parts of the country.

ii. Relying on the informant's report in acutely ill patients might have resulted in lack of appropriate data. This was mitigated by a careful history from the patient or informant present with the most details and physical examination done by the provider while evaluating the patient.

11.0 CONCLUSION

Abdominal pain is a common complaint amongst adult patients presenting to the EMD-MNH. This presentation was associated with significant morbidity and mortality as evidence by very high admission rate, need for surgical intervention and a mortality rate of 8%. Future studies and quality improvement efforts should focus earlier transfer of patients, preventive and early screening of patients for malignancy and reducing the length of stay in the hospital.

12.0 RECOMMENDATIONS

Providers in acute care settings should increase their recognition skills of life-threatening causes of abdominal pain and treat them accordingly and where there is a need for emergent surgery to advocate for the patients' appropriate treatment.

Providers at peripheral hospitals should be trained to prompt recognize life threatening symptoms/signs and refer to treat these patients accordingly to the capacity of their facility without delay in care.

More emphasis to the population in health seeking tendencies so as to pick diseases in their trivial stages.

Further research is needed to identify gaps in management of adults with acute abdominal pain as the mortality is high.

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APPENDICES

APPENDIX I: CONSENT IN PARTICIPATING IN RESEARCH: ENGLISH VERSION

STUDYTITLE: CLINICAL EPIDEMIOLOGY, MANAGEMENT AND PREDICTORS OF OUTCOMES OF ADULT PATIENTS WITH NON-TRAUMATIC ACUTE ABDOMEN PRESENTING TO THE EMERGENCY MEDICINE DEPARTMENT OF MUHIMBILI NATIONAL HOSPITAL

Introduction

Greetings, my name is Dr. Kilalo M. Mjema, a second-year resident in the Department of Emergency Medicine at Muhimbili University of Health and Allied Sciences (MUHAS).

I am conducting a study with the above title as part of my study program. I kindly request your participation and cooperation in my study in the presence of my research assistant and I as we approach you. Your decision to or not to participate will have no effect on the care and management given to you or your patient. Please ask questions if there is anything about this study you do not understand.

Aim of the study

The purpose of this study is to characterize and describe the outcome all adults who present with non-traumatic acute abdomen at the emergency department.

Benefits

There will be an overall benefit after knowing the results and its implication to the hospital with no payment for participation in the study.

Risks

There is no risk in participating in this study.

What does this study involve?

This study involves the research assistant or principal investigator asking structured questions to the caretaker or patient and filling the responses in the prepared questionnaire. Also, information about the patient will be obtained from the patient's file or electronic medical records.

Consent

Your participation in this study is completely voluntary and agreeable by signing the consent form. If you are not free you are allowed not to participate and this will not affect the care and management offered to you or the child you brought for treatment. You may choose to stop taking part in this study at any time for any reason.

Confidentiality

The information you provide is highly valued and will be kept strictly confidential. The study information will be stored in protected computer files and in paper records stored in locked filing cabinet. Only study staff will have access to the information.

Access of information

By signing this form, you allow the research team to use the information and give it to others involved in the research. The research team includes the researcher, facilitators plus others working on this study at MUHAS and MNH.

For further information, questions or queries, you can contact:

1. The Principal Investigator, Dr. Kilalo Maeli Mjema,
   Department of Emergency Medicine,
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3. Prof Bruno F. P. Sunguya,
   Ag. Director of Research and Publications,
   MUHAS,
   P.O. Box 65001,
   Dar es Salaam,
   Tanzania. Tel: 2152489.

Signature:

I (Initial letter of your names) _____ have read/been told the contents of this form. My questions have been answered. I agree to participate in this study.

Signature of participant _____

Date of signed consent _____

APPENDIX 2: CONSENT IN PARTICIPATING IN RESEARCH: SWAHILI VERSION

STUDY TITLE: **CLINICAL EPIDEMIOLOGY, MANAGEMENT AND PREDICTORS OF OUTCOMES OF ADULT PATIENTS WITH NON-TRAUMATIC ACUTE ABDOMEN PRESENTING TO THE EMERGENCY MEDICINE DEPARTMETN OF MUHIMBILI NATIONAL HOSPITAL**

FOMU YA RIDHAA YA KUSHIRIKI KATIKA UTAFITI

Utangulizi:

Jina langu naitwa Dkt. Kilalo M. Mjema, mwanafunzi wa udaktari bingwa wa magonjwa ya dharura (Emergency Medicine) katika chuo kikuu cha afya na sayansi shirikishi Muhimbili (MUHAS). Ninaomba ushiriki wako kwa niaba ya mwanao katika utafiti huu endapo mimi ama msaidizi wangu atakapokufuata ili kukuuliza taarifa muhimu za mgonjwa wako.

Madhumuni ya utafiti:

Utafiti huu unalenga katika kujua aina, sababu na hatma ya watu wazima wanaokuja idara ya magonjwa ya dharura wakiwa na tatizo la kuumwa tumbo katika hospitali ya taifa ya Muhimbili.

Ushiriki katika utafiti:

Mtu mzima yeyote mwenye umri wakulingana au zaidi ya miaka 18 aliyefika idara ya magonjwa ya dharura kwa lalamiko la kuumwa tumbo atajumuishwa katika utafiti huu baada ya yeye ama mlezi kuridhia ushiriki.

Hatari:

Hatutarajii kuwepo na athari/hatari yeyote itokanayo na ushiriki katika utafiti huu.

Faida ya utafiti:

Kwa kushiriki katika utafiti huu, tutaweza jua ni magonjwa gani ya tumbo yanayosumbua sana watu wazima wa eneo hili na pia kujua hatma yao baada ya kupewa matibabu. Matokeo ya utafiti huu yatamsaidia mtoa huduma atakayemwona mtu mzima anayeumwa tumbo kutoa huduma kwa haraka pasipo kuchelewesha.

Usiri:

Taarifa zote zitakazokusanywa katika utafiti huu zitakuwa siri, hivyo ushiriki wako hautajulikana na mtu. Taarifa hizi zitajulikana kwenye timu ya watafiti tu.

Malipo:

Kwa kushiriki kwenye utafiti huu, hautalipwa wala hautalipa chochote.

Ukiwa na swali au tatizo lolote, unaweza kuwasiliana na wafuatao.

1. Mkuu wa utafiti
   Dr. Kilalo Maeli Mjema
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KUWEKA SAHIHI YA MAKUBALIANO:

Mimi (herufi za mwanzo za majina yako) _____, nimesoma/nimesomewa maelezo yote yaliyomo kwenye fomu hii na nimeelewa. Maswali yangu yamejibiwa vizuri na niko tayari kushiriki.

Sahihi ya mshiriki _____

Tarehe _____

Non Traumatic Acute Abdomen

Record ID _____

14.3 DATA COLLECTION SHEET

INCLUSION CRITERIA: All adult consenting (self or next of kin/relatives) patients with non-traumatic acute abdomen (abdominal pain with or without abdominal distension, nausea, vomiting, diarrhea, vaginal bleeding or amenorrhea) presenting to the Emergency Department of Muhimbili National Hospital from August 2017 to January 2017.

ENROLLMENT

Date of presentation _____

Time (in 24hours) _____

DEMOGRAPHICS

First Name _____

Surname _____

MR number _____

Age (years) _____

Date of birth _____

Gender
◯ Male
◯ Female

Referral
◯ Yes
◯ No

Referral hospital _____

Informant
◯ Patient
◯ Other

Patient informant phone number _____

Other informant phone number _____

Other informant relation to patient _____

Added phone number _____

HISTORY OF PRESENTING COMPLAINTS

Presenting complaints

- ☐ Abdominal pain
- ☐ Nausea
- ☐ Vomiting
- ☐ Diarrhea
- ☐ Constipation
- ☐ Fever
- ☐ Weight loss
- ☐ Abdominal distension
- ☐ Others 1
- ☐ Others 2
- ☐ Others 3

Other presenting complaints 1 _____

Other presenting complaints 2 _____

Other presenting complaints 3 _____

Abdominal pain

- ◯ Days
- ◯ Months
- ◯ Years

Days _____

Months _____

Years _____

Nausea

- ◯ Day
- ◯ Month

(duration in days)

Days _____

Months _____

Vomiting

- ◯ Day
- ◯ Month

(duration in days)

Days _____

Months _____

Diarrhea

- ◯ Day
- ◯ Month

(duration in days)

Days _____

Months _____

Constipation

- ◯ Day
- ◯ Month

(duration in days)

Days _____

Months _____

Fever

◯ Day
◯ Month
(duration in days)

Days _____

Months _____

Weight loss

◯ Day
◯ Month
◯ Year
(duration in days)

Days _____

Months _____

Years _____

Abdominal distension

◯ Day
◯ Month
◯ Year
(duration in days)

Days _____

Months _____

Years _____

Others 1

◯ Day
◯ Month
◯ Year
(duration in days)

Days _____

Months _____

Years _____

Others 2

◯ Day
◯ Month
◯ Year
(duration in days)

Days _____

Months _____

Years _____

Others 3

◯ Day
◯ Month
◯ Year
(duration in days)

Days _____

Months _____

Years _____

Co-morbid conditions

- ☐ None
- ☐ Unknown
- ☐ Hypertension
- ☐ Diabetes
- ☐ HIV
- ☐ Known malignancy
- ☐ Previous hx of abdominal surgery
- ☐ Others 1
- ☐ Others 2
- ☐ Others 3

Other co-morbid condition 1 _____

Other co-morbid condition 2 _____

Other co-morbid condition 3 _____

VITALS

Systolic Blood pressure (in mmHg) _____

Diastolic Blood Pressure(in mmHg) _____

Heart rate (in beats per minute) _____

Respiratory rate (in breaths per minute) _____

Oxygen saturation(in percentage)

- ◯ Room air
- ◯ On oxygen

Oxygen Saturation RA(in %) _____

Oxygen saturation on oxygen(in %) _____

Temperature (in degrees Celsius) _____

Random Blood Glucose (in mmol/L) _____

PRIMARY SURVEY

Airway assessment

- ◯ Not done
- ◯ Normal
- ◯ Abnormal

(check for secretions, foreign body if any)

Breathing assessment

- ◯ Not done
- ◯ Normal
- ◯ Abnormal

(check for tachypnea, bradypnea, agonal breathing, hypoxia)

Circulation assessment

- ◯ Not done
- ◯ Normal
- ◯ Abnormal

(check cap refill, feel extremities if they are cold or clammy, hypotension)

Disability assessment
◯ Not done
◯ Normal
◯ Abnormal
(check the GCS, RBG, pupils reaction)

Exposure abnormalities
◯ Not done
◯ Normal
◯ Abnormal
(check for anything out of normal, skin lesions, distension)

SECONDARY SURVEY

Abdominal examination
☐ Normal
☐ Distension
☐ Mass palpable
☐ Tenderness
☐ Guarding
☐ Bowel sounds normal
☐ Bowel sounds reduced
☐ Bowel sounds increased
☐ Gloved finger stained with feaces
☐ Gloved finger stained with blood
☐ Gloved finger not stained with anything
☐ DRE not done

Site of mass palpable
◯ RUQ
◯ LUQ
◯ RLQ
◯ LLQ
◯ Epigastric
◯ Suprapubic

Site of tenderness
◯ Generalized
◯ RUQ
◯ LUQ
◯ RLQ
◯ LLQ
◯ Epigastric
◯ Suprapubic

HEENT
◯ Normal
◯ Abnormal
◯ Not done

Neck
◯ Normal
◯ Abnormal
◯ Not done

Central Nervous System
◯ Normal
◯ Abnormal
◯ Not done

Respiratory system
◯ Normal
◯ Abnormal
◯ Not done

Cardiovascular system
◯ Normal
◯ Abnormal
◯ Not done

Genital urinary system
◯ Normal
◯ Abnormal
◯ Not done

Musculoskeletal system
◯ Normal
◯ Abnormal
◯ Not done

Skin
◯ Normal
◯ Abnormal
◯ Not done

EMD DIAGNOSES

EMD diagnosis 1 _____

EMD diagnosis 2 _____

EMD diagnosis 3 _____

POC INVESTIGATIONS

UPT
◯ Done
◯ Not done
◯ Not applicable
(write N/A for Men and Not done where applicable)

UPT results
◯ Negative
◯ Positive

VBG/ABG
◯ Done
◯ Not done

POC Na _____

POC K _____

POC Cl _____

pH _____
(write not done where applicable)

PCO2 _____

HCO3 _____

Anion gap _____

CHEM8
◯ Done
◯ Not done

POC Na _____

POC K _____

POC Cl _____

Hematocrit _____

Hemoglobin _____

Creatinine _____

Serum Urea _____

Urine dipstick
◯ Done
◯ Not done

Leucocytes _____
(write not done where applicable)

Nitrate _____

Blood _____

Protein _____

Ketones _____

POC PT PTT INR
◯ Done
◯ Not done

PT _____
(write not done where applicable)

PTT _____

INR _____

POC abdominal ultrasound
◯ Done
◯ Not done

POC abdominal ultrasound DONE
◯ Normal
◯ Abnormal

Free fluid in the abdomen
◯ Yes
◯ No

Features of cholecystitis
◯ Yes
◯ No

Features suggestive of cholelithiasis
◯ Yes
◯ No

Features suggestive of ectopic pregnancy
◯ Yes
◯ No

Features suggestive of abruptio placenta
◯ Yes
◯ No

Features suggestive of placenta praevia
◯ Yes
◯ No

Adnexa mass
◯ Yes
◯ No

Features suggestive of Abdominal Aortic aneurysm
◯ Yes
◯ No

Features suggestive of abdominal aortic dissection
◯ Yes
◯ No

ECG
◯ Done
◯ Not done

ECG results
◯ Normal
◯ Abnormal

CPL WORK UP

FBP
◯ Done
◯ Not done

WBCs _____

Hemoglobin _____

Platelets _____

Serum H pylori
◯ Negative
◯ Positive
◯ Not done

Lipase
◯ Done
◯ Not done

Lipase _____

Amylase
◯ Done
◯ Not done

Amylase _____

Creatinine
◯ Done
◯ Not Done

Creatinine _____

Serum urea
◯ Done
◯ Not done

Serum urea _____

Liver enzymes
◯ Done
◯ Not done

ALT _____

AST _____

Alkaline phosphatase _____

Electrolytes
◯ Done
◯ Not done

CPL Na _____

CPL K _____

CPL Ca _____

CPL Mg _____

CPL phosphorus _____

IMAGING WORK UP

Abdominal Xray
- ◯ Not done
- ◯ Done

Abdominal Xray
- ◯ Erect
- ◯ Supine
- ◯ Both

Erect abdominal Xray
- ☐ Normal
- ☐ Multiple fluid levels
- ☐ Air under hemi-diaphragm
- ☐ Distended bowels
- ☐ Empty rectum

Supine abdominal xray
- ☐ Normal
- ☐ Distended bowels

Both
- ☐ Normal
- ☐ Air fluid levels
- ☐ Air under the right hemi-diaphragm
- ☐ Distended bowels
- ☐ Empty rectum

Chest Xray
- ◯ Done
- ◯ Not done

Chest Xray Done
- ◯ Normal
- ◯ Abnormal

Formal abdominal pelvic US
- ◯ Done
- ◯ Not done

Formal abdominal pelvic uss
- ◯ Normal
- ◯ Abnormal

CT abdomen
- ◯ Done
- ◯ Not done

CT abdomen
- ◯ Normal
- ◯ Abnormal

TREATMENT, CONSULTATION AND DISPOSITION

IV fluids
- ◯ Given
- ◯ Not given

How much fluid(in liters) _____

Anaelgesics
- ◯ Given
- ◯ Not given

Anaelgesics given
- ☐ Diclofenac IM
- ☐ Paracetamol IV
- ☐ Tramadol IV
- ☐ Pethidine IM
- ☐ Morphine IV
- ☐ Fentanyl IV
- ☐ Ketamine IV

Antibiotics
◯ Given
◯ Not given

Antibiotics given
☐ Metronidazole IV
☐ Ceftriaxone IV
☐ Co-amoxyclav IV
☐ Vancomycin IV
☐ Clindamycin IV
☐ Cefipime IV
☐ Ampicillin IV
☐ Gentamycin IV
☐ Meropenem IV
☐ Piperacillin-tazobactam IV

NGT placement
◯ Yes
◯ No

Blood transfussion
◯ Yes
◯ No

BT units given _____

Other treatment 1 _____

Other treatment 2 _____

Other treatment 3 _____

Other treatment 4 _____

Other treatment 5 _____

Consultation to other services
◯ Done
◯ Not done

Consultation done
☐ General Surgery
☐ OBGYN
☐ Gastroenterology
☐ Cardiac
☐ Vascular surgeon
☐ Urology
☐ Nephrology

Disposition
☐ Discharged
☐ Discharged against medical advice
☐ Absconded
☐ Admitted to wards
☐ Emergency Theatre
☐ Died in ED
☐ Transfered to another hospital

Discharge date _____

Discharge time _____

Admitting ward _____

Intra OP findings _____
(if theatre disposition then fill this field)

Theatre outcomes
◯ Alive
◯ Dead

Date of death _____

Name of hospital transfered _____

Reason of transfer _____

OUTCOMES

24 hours outcome
- ◯ Alive
- ◯ Dead

24 hours outcome
- ◯ ED
- ◯ Ward
- ◯ Theatre
- ◯ Home

Admitting ward _____

Intra OP findings _____
(if theatre disposition then fill this field)

Date of death at 24hrs outcome _____

Place of death
- ◯ ED
- ◯ Ward
- ◯ Theatre

7 days outcome
- ◯ Alive
- ◯ Dead

7 days outcome
- ◯ Ward
- ◯ Home

Date of death at 7days outcome _____

Place of death
- ◯ Ward
- ◯ Theatre
- ◯ Home

FINAL WARD DIAGNOSES

Final Outcome
- ◯ Alive
- ◯ Dead

Discharge date _____

Date of death _____

Final Diagnosis 1 _____

Final diagnosis 2 _____

Final diagnosis 3 _____