ETIOLOGY, MANAGEMENT AND OUTCOME OF ACUTE UPPER GASTROINTESTINAL BLEEDING IN PATIENTS SEEN AT MOI TEACHING AND REFERRAL HOSPITAL, ELDORET, KENYA

BY

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A THESIS SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE AWARD OF THE DEGREE OF MASTER OF MEDICINE IN GENERAL SURGERY, MOI UNIVERSITY

DECLARATION

Declaration by Candidate:

This thesis is my original work and has not been presented for a degree in any academic or research institution. No part of this thesis may be reproduced without prior written permission of the author, supervisors and/or Moi University.

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DEDICATION

This work is dedicated to my wife Jane for her unwavering support in everything I do. To my son Ryan who gives me a reason to work hard each day. To my parents for inspiring the need to excel in education.

ABSTRACT

Background: Upper gastrointestinal bleeding is bleeding into the lumen of the gastrointestinal tract involving the esophagus, stomach and the duodenum. It is the most common form of gastrointestinal bleeding being four times more common than lower gastrointestinal bleeding. It represents approximately 1% of emergency room admissions with a mortality rate of 4 – 14% worldwide. Leading causes worldwide include peptic ulcer disease and esophageal varices. Management requires initial resuscitation and stabilization followed by endoscopic evaluation to make a definitive diagnosis. Ultimate management is medical, endoscopic surgery or open surgery. Although this type of bleeding is common, it has not been described in the Western Kenya region.

Objective: To describe the etiology, management and outcome of upper gastrointestinal bleeding among patients seen at the Moi Teaching and Referral Hospital.

Methods: This was a prospective descriptive census study conducted at the Moi Teaching and Referral Hospital, Eldoret, Kenya, between October 2015 and September 2016. A total of 63 patients aged 18 years and above presenting with upper gastrointestinal bleeding were recruited into the study. Data was collected using a structured data collection form by interviewing the patients and checking their files. The etiology, management and outcome were recorded. Data analysis was done using R statistical package version 3.4.2, year 2017. Frequency tables were generated for categorical variables. Factors associated with control of bleeding and re-bleeding were assessed using logistic regression model with odds ratio and 95% confidence intervals reported. Time to death was described using Kaplan-Meier survival curve. Predictors of death were assessed using Cox proportional hazards regression model. Results were presented using tables and graphs.

Results: The leading etiologies of upper gastrointestinal bleeding at Moi Teaching and Referral Hospital were gastroduodenal erosions (27.6%), gastroesophageal tumors (25.6%), varices (14.9%) and ulcer (14.8%). Diagnostic endoscopy was done in 74.6% of the participants. Definitive management was medical (81.0%), endoscopic surgery (12.7%) and open surgery (6.3%). Control of bleeding was achieved for 81.0% of participants with a 46.0% re-bleeding rate reported. A higher pulse rate (>100bpm) had up to 86% reduced odds of bleeding control, OR: 0.14(95% CI: 0.03, 0.62). On the other hand, high SBP (>90mmHg) was associated with increased odds of controlling bleeding, OR: 10.63 (95% CI: 2.86, 39.49). However, participants with normal platelet count were less likely to re-bleed, OR: 0.29 (95% CI 0.10, 0.81). Mortality rate was 20.6% with death occurring faster within the first 5 days.

Conclusion: At Moi Teaching and Referral Hospital, the main etiologies were gastroduodenal erosions, gastroesophageal tumors, varices and ulcers. Majority of the patients underwent medical management. Re-bleeding and mortality rates were high.

Recommendations: High index of suspicion on etiology of upper gastrointestinal bleed being a tumor. Measures to be put in place to mitigate the high morbidity and mortality by using the mentioned predictors in clinical practice such as thrombocytopenia and appropriate primary diagnosis of bleeding.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF ABBREVIATIONS AND ACRONYMS

ALT	Alanine aminotransferase
AST	Aspartate aminotransferase
H. pylori	Helicobacter pylori
HR	Hazard Ratios
HVPG	Hepatic-Venous Portal Gradient
INR	International Normalizing Ratio
IREC	Institutional Research and Ethics Committee
KNH	Kenyatta National Hospital
MSS	Musculoskeletal system
MTRH	Moi Teaching and Referral Hospital
NSAIDs	Non-steroidal anti-inflammatory drugs
OGD	Oesophagogastroduodenoscopy
PCV	Packed cell volume
PPIs	Proton pump inhibitors
SBP	Systolic blood pressure
TIPS	Transjugular Intrahepatic Portosystemic Shunt
UGIB	Upper gastrointestinal bleeding
Y-GT	Gamma-Glutamyltransferase

OPERATIONAL DEFINITION OF KEY TERMS

Etiology	Causes of bleeding.
Management	Clinical presentation, investigations done and treatment.
Outcome	Re-bleeding, length of hospital stay and mortality.

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I appreciate my supervisors, colleagues and teachers for their continued support and guidance in preparation of this thesis. Above all I thank God for this opportunity and His mercies.

CHAPTER ONE

1.0 INTRODUCTION

1.1 Background

Upper gastrointestinal bleeding is defined as bleeding into the lumen of the gastrointestinal tract above the ligament of Treitz (Colin 2013; Marinos et. al. 2013). It presents with hematemesis or passage of melena stools. It is estimated that about 100–150 cases will occur per 100,000 adults annually in any given population (presenting approximately 1% of emergency room admissions) (Ahmed et. al. 2012; Mohammad et. al. 2010; Olusegun et. al. 2014).

The most common etiological factors worldwide include peptic ulceration (35–50%), esophagitis (5–15%) and esophageal varices (10-15%) accounting for approximately 45-65% in total (Mohammad et. al. 2010; Marinos et. al. 2013). A study done at KNH showed that etiologically esophageal varices contributed 35%, duodenal ulcers 17.5% and superficial inflammatory lesions 17.5% (Lule et. al. 1994). Among the causes of peptic ulceration include *Helicobacter pylori (H. pylori)* and use of nonsteroidal anti-inflammatory drugs (NSAIDs). Reduction in bleeding associated with peptic ulceration has been attributed to advances in management of *H. pylori* infection (Ting et. al. 2014), increased use of PPIs due to its availability and improved diagnostics (endoscopy). On the other hand, increasing use of nonsteroidal anti-inflammatory drugs (NSAIDS) in an ageing population may change the incidence, age of presentation, site of bleeding and outcome of patients with non-variceal UGIB (Mohammad et. al. 2010; Ray et. al. 2014). Esophagitis is inflammation of the epithelial lining of the esophagus. It is usually a result of infections, gastro-esophageal reflux disease, ingestion of corrosives and ingestion of some medications such as

bisphosphonates. Esophageal varices are engorged veins within the esophageal wall. They occur as a result of portal hypertension. The causes of which include liver cirrhosis and parasitic infections such as schistosomiasis (Ahmed et. al. 2012).

Management of UGIB involves appropriate timely diagnosis and initial stabilization with close monitoring. Endoscopy is required to confirm the diagnosis and in severe bleeding it is therapeutic. It is also used to complete the risk assessment and assign a score to the patient's condition thus guiding further management. Surgical intervention is required in approximately 3-15% of the patients (Christopher et. al. 2002).

Mortality following UGIB lies between 4 – 14% worldwide (Ahmed et. al. 2012; Mohammad et. al. 2010; Olusegun et. al. 2014). Locally the mortality was reported to be 5% in a study done in KNH more than 20 years ago (Lule et. al. 1994). These figures may have changed due to differences in socioeconomic status with patients taking time to access health care, possible dependence on over the counter treatments and the relatively high cost of appropriate medications and procedures. Uncontrolled bleeding has been shown to increase mortality significantly to as high as 25% especially in those cases that will require surgical intervention (Johnson 1983). Use of endoscopy has led to significant reduction in this mortality to as less as 10% (Johnson 1983).

1.2 Problem statement

Upper gastrointestinal bleeding forms a common reason for hospital admission. It accounts for approximately 1% of emergency room admissions. In Moi Teaching and Referral Hospital, Eldoret, approximately 7 patients presented with the condition every month in 2015 (MTRH records 2015). Initial appropriate diagnosis will guide in the subsequent management of these patients and influence the outcome. The aim is to avert complications such as unnecessary long hospital stay, re-bleeds and mortality (Hisham et. al. 2013; Ray et. al. 2014). By following the patients step by step and documenting the interventional measures employed and their eventual influence on outcome, a conclusive opinion will be made on how to appropriately manage the condition in line with appropriate international guidelines (Hisham et. al. 2013; Marinos et. al. 2013; NICE 2015).

1.3 Justification

Upper gastrointestinal bleeding is the most common gastrointestinal bleeding being 4 times higher than lower gastrointestinal bleeding. It has a mortality ranging from 4% to 14% (Ahmed et. al. 2012; Olusegun et. al. 2014). Available data in the country was in a study done more than 20 years ago (Lule et. al. 1994).

The management of the condition has evolved, as has its causes and prognosis, over the past 20 years (Hisham et. al. 2013). The addition of international guidelines has helped define current-day standards of care. The management and diagnostics have improved due to availability of PPIs and endoscopy. Therefore; a more recent study in our setup will be appropriate in capturing any changes that would influence the management and therefore the outcome of the entity favorably. This will bring out the standards of care locally and any limitations. This will help standardize the

management in line with international standards which will translate to improved outcome and improved patients' life with reduction in direct and indirect health care costs (Campbell et. al. 2015).

The study will also guide and provide the basis for future research into the topic using the figures and results obtained.

1.4 Research question

What are the causes, management modalities and outcome of upper gastrointestinal bleeding among patients seen at the MTRH?

1.5 Objectives

1.5.1 Broad objective:

To determine the etiology & outcome and describe the management of upper gastrointestinal bleeding in patients seen at the Moi Teaching and Referral Hospital.

1.5.2 Specific objectives:

1. To determine the etiology of upper gastrointestinal bleeding in patients seen at the MTRH.
2. To describe the clinical presentation of patients seen with UGIB at the MTRH.
3. To analyze the treatment modalities and investigations used in the MTRH for patients with UGIB.
4. To determine the outcome of UGIB in patients seen at the MTRH.

CHAPTER TWO

2.0 LITERATURE REVIEW

Upper gastrointestinal bleeding is common and severally presents as an emergency worldwide. This means that it often requires admission accounting for approximately 1% of emergency room admissions. It is estimated that about 100–150 cases will occur per 100,000 adults per year in any given population (Mohammad et. al. 2010; Olusegun et. al. 2014).

2.1 Etiology of upper gastrointestinal bleeding

The most common causes of UGIB are peptic ulcer disease (gastric and duodenal ulcers) (35–50%), gastroduodenal erosions (8–15%), esophagitis (5–15%) and varices (10–15%) (Marinos et. al. 2013; Ray et. al. 2014). A study done in KNH showed esophageal varices as a leading cause at 35% (Lule et. al. 1994). Other causes of UGIB include Mallory-Weiss tear, Boerhave tear (5%), neoplasms- esophageal, gastric, kaposis sarcoma (2%), dieulafoy lesion, arterio-venous malformations (5%), angiodysplasias, hemobilia, pancreatic pseudocyst and pancreatic pseduoaneurysm, foreign body, Merkels diverticulum, coagulopathy and aorto-enteric fistula (0.2%) (Christopher et. al. 2002).

The various etiological factors of UGIB cause a weakening of the mucosa which leads to breakdown and subsequent bleeding. This can be through distension as is the case with varices which eventually rupture or excess acid production that cause mucosal damage. Also some agents like alcohol and toxins do cause direct mucosal injury in the acute phase in addition to them being precursors of such conditions as cirrhosis. Others like tumors are naturally susceptible to spontaneous bleeding due to their tendency to ulcerate owing to their aberrant growth. Eventually severe bleeding can

occur or cause gradual bleeding leading to melena. The pathophysiology has not changed significantly over time. Therefore, the target of management is to institute timely and appropriate interventions that mitigate adverse outcomes.

2.2 Clinical presentation and investigations in patients with UGIB

2.2.1 Clinical presentation

The main presentation of UGIB is hematemesis and/ or melena. In severe bleeding a patient may present with hematochezia. In order of frequency the symptoms are melena in 70-80% of the patients, hematemesis in 40-50%, hematochezia, syncope and pre-syncope (Christopher et. al. 2002). A history of some symptoms some days prior to presentation to hospital may be suggestive of UGIB. These include heartburns, inability to swallow, weight loss, non-specific abdominal pains and yellowness of the eyes among others. Some signs and symptoms such as tachycardia and hypotension have a direct correlation with poor outcome (Lule et. al. 1994). A history of recent NSAID use leads to suspicion of gastric ulcer or history of chronic back and joint pains showing the need for NSAIDs and steroid use (Ray et. al. 2014). In addition use of alcohol chronically can point towards a possibility of portal gastropathy or esophageal varices.

2.2.2 Investigations

After initial history taking and examination, investigations are ordered to aid in diagnosis and assessing severity of the disease. These include; full hemogram, of which packed cell volume (PCV) is more accurate in estimating blood loss in the setting of acute hemorrhage unlike hemoglobin level. However a low hemoglobin level of < 8g/dl is correlated with a higher mortality (Lule et. al. 1994).

Urea and electrolytes are done and help to rule out renal failure.

In addition, liver function tests are done. These tests help to pick a liver pathology especially if the bleeding is variceal in origin. Other tests in line with liver function are coagulation profiles like prothrombin time (INR).

Cross-matching of at least two units of blood is done.

Tests to identify presence or absence of *H. pylori* in those patients suspected to have this agent. Tests include urea breath test, *H. pylori* stool antigen and rapid urease test.

The imaging modality of choice and gold standard is endoscopy. It can be both diagnostic and therapeutic (Hisham et. al. 2013; Isabelle et. al. 2014). Patients with severe bleeding are offered endoscopy immediately after resuscitation. All other patients are offered endoscopy within 24 hours of admission (NICE 2015).

2.3 Management modalities of patients with UGIB

2.3.1 Resuscitation and initial management

The optimal management of acute bleeding requires a multifactorial approach, including evaluation and resuscitation, blood transfusion, use of vasoactive drugs, performance of early diagnostic and therapeutic endoscopy, administration of prophylactic antibiotics, and consideration of placement of a covered trans-jugular intrahepatic porto-systemic shunt (TIPS) in case of failure of endoscopic treatment. However, this step-by-step approach is not usually possible in an acutely bleeding patient who is decompensated and most, if not all, of these steps must be considered or performed almost simultaneously to succeed (Isabelle et. al. 2014).

Airway protection is considered although prophylactic intubation has not been shown to reduce mortality, aspiration pneumonia or cardiovascular events (Isabelle et. al. 2014). Early endotracheal intubation is advised before endoscopy in patients with ongoing hematemesis, hemodynamic instability in spite of volume loading, agitation with the absence of cooperation during physical examination, or Glasgow Coma Scale less than 8 (Isabelle et. al. 2014).

Intravenous access is established. Volume replacement is done with the aim of elevating the systemic blood pressure to 100mmHg. Care should be taken to avoid fluid overload.

Patients with massive bleeding are transfused with the aim of achieving a hemoglobin count of between 7 to 8g/dl. A restrictive blood transfusion is associated with a reduction in further bleeding and re-bleeding, a reduction in complication rate, and increased survival (Isabelle et. al. 2014).

Platelets are offered for those who are actively bleeding and have a platelet count less than 50 x 10^9/ liter. Fresh frozen plasma is given to those actively bleeding and have a prothrombin time or activated partial thromboplastin time greater than 1.5 times normal limit. Cryoprecipitate is given to those whose fibrinogen levels remain less than 1.5g/liter even after being given fresh frozen plasma (NICE 2015). However one should avoid giving excess fresh frozen plasma in those with liver pathology since it causes a rise in portal pressure and can lead to further bleeding in case of varices (Isabelle et. al. 2014).

2.3.2 Vasoactive therapy

Vasoactive therapy is used in patients with suspected variceal bleeding at presentation and stopped once definitive diagnosis is made or after 5 days since it has been shown to have no superior benefit in non-variceal UGIB (Hisham et. al. 2013). However, their use in variceal bleeds has a positive influence on mortality and has been shown to reduce bleeding in 80% of the cases (Isabelle et. al. 2014). These drugs include terlipressin, octreotide, somatostatin, and vapreotide. Terlipressin has fewer side effects and has a longer half-life (Bertram et. al. 2009; Isabelle et. al. 2014).

Other medications used in control of acute bleeding include drugs such as tranexamic acid and ethamsylate. They act by correcting abnormal platelet adhesion, hence preventing capillary bleeding. They are more readily available compared to the other stated vasoactive medications.

2.3.3 Antibiotic prophylaxis

Patients suspected to have variceal bleeding should get antibiotic prophylaxis. This has been shown to reduce rates of re-bleeding and morbidity in these patients who are susceptible to bacterial infections due to the underlying liver disease (Isabelle et. al. 2014). However other studies report no change in in-hospital mortality (Shih-Cheng et. al. 2014). The mortality in this case is from non-bleeding related causes. Antibiotics commonly used are fluoroquinolones but ceftriaxone is used where high levels of fluoroquinolone resistance exist.

2.3.4 Endoscopic treatment

This is a key instrument in management of UGIB. It should be performed early, (in the first 12 hours after admission especially where variceal bleeding is suspected). Endoscopic therapy should be performed at once if there is a diagnosis of variceal bleeding (Hisham et. al. 2013; Ting-Chun et. al. 2014). Criteria for variceal bleeding includes active bleeding from a varix; presence of a 'white nipple' fibrin clot overlying a varix; a clot on a varix; the presence of varices without other potential source of bleeding; and fresh blood in the stomach (Hisham et. al. 2013; Isabelle et. al. 2014). Some authorities say that very early endoscopy (within 12 hours) has no particular benefit compared with early endoscopy (done between 12 to 24 hours) in terms of mortality, re-bleeding and need for surgery (Hisham et. al. 2013). Modalities that have been used here include injection, mechanical therapy and thermal therapy. Agents used in injection include epinephrine, sclerosing agents (ethanolamine, absolute alcohol, sodium tetradecyl sulfate and saline) and tissue adhesives such as cyanoacrylate, thrombin and fibrin glue. Mechanical therapy includes rubber band ligation and use of clips. Thermal modalities include use of electric current to cauterize a bleeding vessel.

Dilute epinephrine offers control of bleeding by inducing local and vascular tamponade and may also cause vasoconstriction and platelet aggregation. It is injected in four quadrants around the region of target and in the region itself. Large volumes are usually required to achieve hemostasis and it is used in conjunction with other modalities. Tissue adhesives create a seal at the bleeding site as well as tamponade. Sclerosing agents cause direct tissue injury and hence thrombosis (Hisham et. al. 2013).

Mechanical therapy works via approximation of submucosa around the bleeding hence sealing off the bleeding. Mostly employs use of endoscopic clips. However, they require skill to use and some sites such as bleeding from the lesser curvature of the stomach may limit their use. Band ligation is used effectively in esophageal varices (Hisham et. al. 2013).

Thermal therapies work by causing occlusion and tamponade locally by pressure application and the heat current induces coagulation of the vessel as well as platelet aggregation.

Hemostatic powders are a new endoscopic modality emerging. It consists use of inorganic powders that become adhesive and coherent once in contact with moisture in the stomach (Hisham et. al. 2013).

2.3.5 Follow-up

For those who re-bleed and are stable having been diagnosed with esophageal varices, a repeat endoscopy can be done. Those with gastric varices have only one endoscopy done, no repeats. Vasoactive medications are given at maximum doses and if this fails then alternative therapy is applied (Isabelle et. al. 2014). Available options are balloon tamponade and Trans-jugular intrahepatic portosystemic shunts (TIPS). For gastric varices cyanoacrylate is used.

Patients who stop bleeding from varices have a risk of re-bleeding of about 60% within 1–2 years if left untreated, with a mortality of 33% (Isabelle et. al. 2014). As such these patients get treatment (secondary prophylaxis) for prevention of this complication. What is offered is a combination of endoscopic ligation and pharmacologic treatment. Endoscopic repeats should be done every 3-6 months.

Pharmacological agents used are B-blockers such as propranolol. Ideally Hepatic Venous Portal Gradient measurement should be done to monitor response to pharmacotherapy. Other treatments for prevention of variceal bleeding include shunt surgery, and hepatic transplant.

Proton pump inhibitors are used to provide acid suppression after endoscopy allowing for healing and successfully preventing chances of re-bleeding and mortality (Hisham et. al. 2013). These are started even before endoscopy as they have been shown to reduce chances of re-bleed after the procedure (Ting-Chun 2014). High doses are recommended such as IV 80mg bolus followed by 8mg/h for 3 days.

H. pylori eradication therapy is used in patients who are confirmed to have *H. pylori* related peptic ulcer disease.

2.4 Outcome of UGIB

Complications associated with UGIB include shock and re-bleeding. In addition, there are complications associated with band ligation such as superficial ulcerations, esophageal strictures, and delayed bleeding after falling of the rubber rings (Isabelle et. al. 2014). Cardiovascular complications can occur in susceptible patients who have had massive acute blood loss. Socio-economic complications include loss in man hours and finances incurred in hospital.

The mortality of patients admitted with UGIB is approximately 10% (Colin 2013; Hiroshi et. al. 2015; Marinos et. al. 2013; Mohammad et. al. 2010; Olusegun et. al. 2014).

Factors influencing this mortality are: increasing age above 60, comorbidities such as malignancy, renal and hepatic failure among others, shock, cause of bleed with varices and cancer having the highest mortality, endoscopic finding of an actively bleeding vessel and history of re-bleeding. Studies have shown that patients with cirrhosis and UGIB have 10 – 20% mortality (Isabelle et. al. 2014). This has decreased due to aggressive initial resuscitation. However, early (first 6 weeks) mortality is still high (around 40%) in Child–Pugh C patients (Isabelle et. al. 2014). Other risk factors for early mortality include the presence of an infection, portal vein thrombosis and an initial hepatic-venous portal gradient (HVPG) higher than 20 mmHg (Isabelle et. al. 2014). Although HPVG is a powerful indicator of the severity of the bleeding, it is not possible to use in everyday practice.

CHAPTER THREE

3.0 METHODOLOGY

3.1 Study design

This was a prospective descriptive study.

3.2 Study site

The study was conducted in the medical and surgical wards as well as endoscopy and surgical/cardiothoracic outpatient clinics at MTRH.

The wards handle the patients who have been admitted for more close management and monitoring. The clinics are for those who come for subsequent follow-up after discharge from the wards.

MTRH is located in Eldoret town in Uasin-Gishu County, Kenya. Eldoret is along the Nairobi Uganda highway, approximately 310km Northwest of Nairobi, Kenya. It has a capacity of nearly 800 beds and over 1000 outpatients per day (AMPATH 2015). The hospital serves as a teaching hospital for the Moi University School of Medicine, University of Eastern Africa, Baraton and the Kenya Medical Training College, Eldoret. It is the second largest referral hospital in Kenya with a catchment population of about 12 million people.

3.3 Study period

The study was conducted between October 2015 and September 2016.

3.4 Study population

The study population was patients presenting with UGIB at the MTRH.

3.5 Eligibility criteria

3.5.1 Inclusion criteria

1. Patients 18 years and above presenting with UGIB at the MTRH during the period of study.

3.5.2 Exclusion criteria

1. Patients who were re-admitted during the study period and have participated in the same study before.

3.6 Sampling technique

Census study was preferred in this study due to the low number of patients presenting with UGIB per year at MTRH. Data for 2014 showed that 84 patients were managed at MTRH with a diagnosis of UGIB. All adult patients presenting with UGIB during the period of study were therefore consecutively sampled and recruited into the study. These were identified via their presenting complaints and having the aforementioned diagnosis. The diagnosis was made clinically. A total of 63 patients were enrolled into the study.

3.7 Study procedure

Patients presenting with upper gastrointestinal bleeding in MTRH were recruited into the study. Verbal consent was obtained to review their clinical presentation and upon confirmation of the diagnosis, a written consent was sought for inclusion into the study. Their clinical presentation, subsequent management and outcome were recorded. The end point was 2 weeks after discharge or mortality. A total of 63 participants were recruited and followed up to the end point with no reported loss to follow-up. Analysis was done for the 63 study participants.

3.8 Study variables

The main measures of outcome in this study were morbidity (re-bleeding) and mortality. The other variables were evaluated based on how they influenced these two major outcomes. Other factors included were age, socio-economic status and sex.

Management modalities such as investigations, medications and procedures done in the hospital were checked and evaluated. Length of hospital stay was evaluated.

3.9 Data Collection and Management

3.9.1 Data collection

A structured questionnaire was administered. It had both open and closed ended questions. It was kept confidential by the principle investigator throughout the study period. Study subjects were captured in the initial contact with the health care providers either in outpatient or immediately on admission and those who met the criteria were recruited into the study. Daily follow-up was done. The end point of the study was 2 weeks of the initial contact with the patient or upon death or discharge, whichever was longer. Those staying in the ward for longer than 2 weeks were followed up as well.

3.9.2 Data storage

Data captured using questionnaires was entered into an electronic database. The database was encrypted with password to ensure confidentiality. The password was only accessible to the main investigator.

3.9.3 Data analysis and presentation

Data analysis was done using software for statistical computation known as R (R core Team, 2017). Categorical variables such as gender, employment status and mortality were summarized using frequencies and the corresponding percentages. Continuous variables were summarized using median and the corresponding inter quartile range (IQR). Gaussian assumptions were assessed using Shapiro-Wilk test.

Factors associated with a binary outcome such as death, control of bleeding, and re-bleeding were assessed using logistic regression model. Odds ratios and the corresponding 95% confidence intervals (95% CI) were reported. Results were presented using tables and graphs.

3.10 Ethical considerations

Approval to carry out the research was sought from Institutional Research and Ethics Committee (IREC). Permission was granted by MTRH. Informed written consent was obtained from the study participants. The nature of the study was explained to them in details and then they were allowed to make a choice whether to participate or not. No part of the study was harmful to them and regardless of their choice they were not denied the appropriate treatment for their disease status. Those who consented to participate had their information kept confidential during the study period and afterwards. Those who declined participation were treated as per existing hospital protocols. They were denied no treatment. The study results will be disseminated via oral defense of the thesis, publication in local and international journals and communication with colleagues through seminars and conferences.

3.11 Study limitations

Not all the study participants had endoscopy done.

All the clinical parameters could not be done such as INR which could have had a bearing on the predictors of re-bleeding.

CHAPTER FOUR

4.0 RESULTS

4.1 Socio-demographic characteristics

A total of 63 participants were included in the study. The median age was 42.0 (IQR: 30.5, 67.0) years with a minimum and a maximum of 21.0 and 90.0 years respectively. Majority (96.8%) of the participants were unemployed.

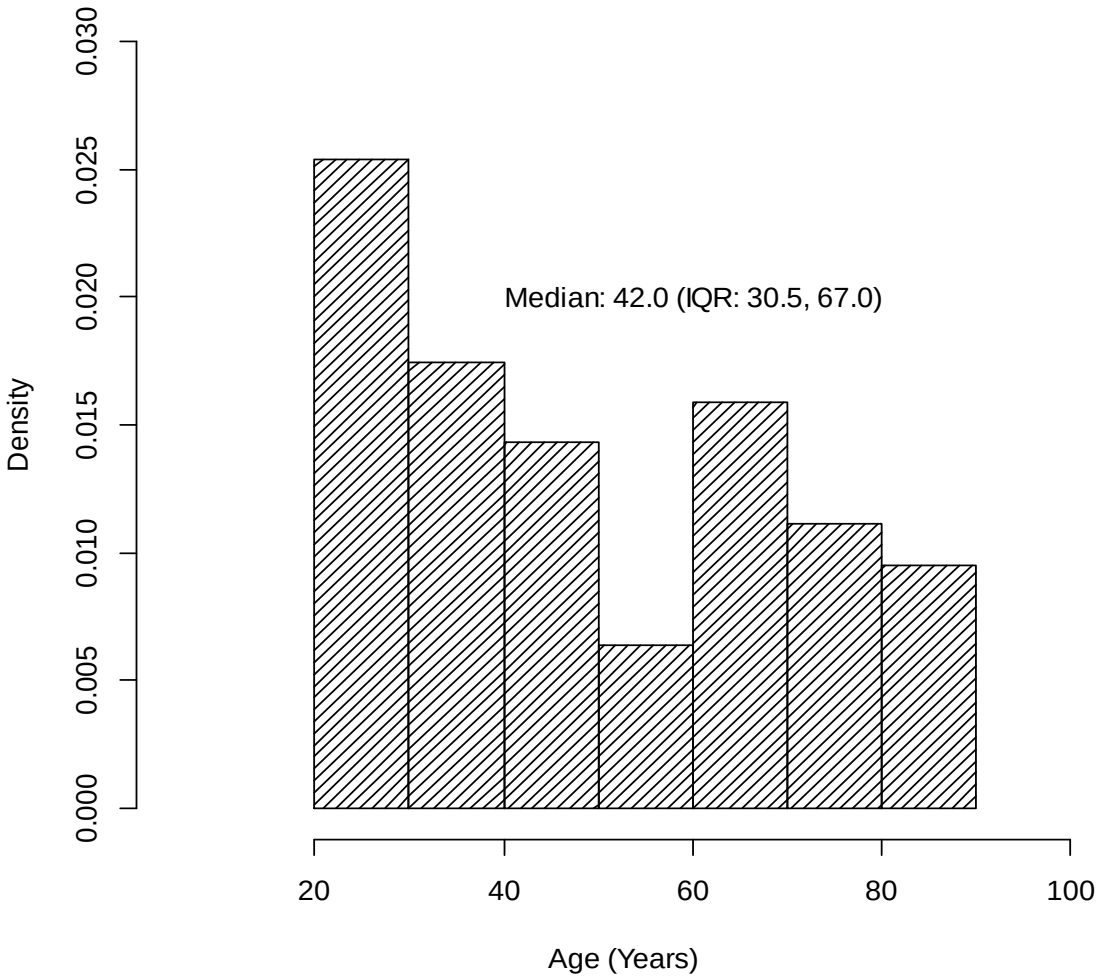

Figure 1: Age distribution

More than two thirds (45 out of 63) of the participants were male giving a ratio of 1:2.5 female to male ratio. Up to 96.8% were unemployed.

4.2 Clinical presentation of patients with upper gastrointestinal bleeding at MTRH

At presentation, the symptoms had lasted a median duration of 3.0 (IQR: 2.0, 14.0) days with the longest duration being 150.0 days. Participants' main complaint was hematemesis at presentation, 60 (95.2%). Up to 55.6% and 63.5% reported complaints of melena, and epigastric pain respectively.

Table 1: Patient symptoms

Variable	Median (IQR) or n (%)
Duration of symptoms (Days)	3.0 (2.0, 14.0)
Range (Min. - Max.)	1.0 – 150.0
Patient's complaints	
Hematemesis	60 (95.2%)
Melena	35 (55.6%)
Epigastric pain	40 (63.5%)

Table 2: Substance use

Variable	n (%)
Smoking	19 (30.2%)
Alcohol use	28 (44.4%)
NSAID use	5 (7.9%)
Anticoagulants	5 (7.9%)
Steroids	0 (0.0%)

Of the 63 participants, 19 (30.2%) had history of smoking, and 28 (44.4%) had history of alcohol use. There were 5 (7.9%), and another (7.9%) who had used NSAID and anticoagulants respectively. None of the participants had history of steroid use.

Table 3: Clinical signs

Variable	N	n (%)
Hemodynamics		
Pulse rate (bpm)		
≤ 100	63	34 (54.0%)
> 100		29 (46.0%)
Systolic blood pressure mm Hg)		
≤ 90	63	19 (30.2%)
> 90		44 (69.8%)
Diastolic blood pressure (mm Hg)		
≤ 60	63	37 (58.7%)
> 60		26 (41.3%)

Clinical signs showed that up to 29 (46.0%) had a pulse rate that was >100 beats per minute. More than two thirds of the participants, 33 (69.8%) had a systolic blood pressure greater than 90 mm Hg, and 26 (41.3%) had a diastolic blood pressure > 60 mm Hg

Table 4: Laboratory investigations

Variable	Sample Size	n (%)
Hematocrit (%)		
< 36	63	50 (79.4%)
36-52		11 (17.5%)
>52		2 (3.2%)
Hemoglobin (g/dL)		
≤ 7	63	28 (44.4%)
> 7		35 (55.6%)
White blood cell count ($x10^9$/L)		
<4		6 (9.5%)
4-11		36 (57.1%)
> 11	63	21 (33.3%)
Red blood cell count ($x10^6$/L)		
<4		38 (60.3%)
4-6	63	23 (36.5%)
> 6		2 (3.2%)
AST		
0-31	41	26 (63.4%)
>31		15 (36.6%)
ALT		
<4		0 (0.0%)
4-32	41	31 (75.6%)
> 32		10 (24.4%)
Y-GT		
<5		1 (5.0%)
5-39	20	18 (90.0%)
> 39		1 (5.0%)
Albumin (g/L)		
<35		36 (94.7%)
35-50	38	2 (5.3%)
> 50		0 (0.0%)
Platelets (x 10^3/L)		
<150		17 (27.0%)
150-450	63	40 (63.5%)
> 450		6 (9.5%)
H. pylori	28	5 (17.9%)

Up to 11 (17.5%) had hematocrit levels that were between 36.0% and 52.0%. Hemoglobin levels were ≤7 g/dL for 28 (44.4%) of the participants. The white and red blood cell counts were between 4.0 – 11.0 x 109/L and 4.0 – 6.0 x 106/L for 36 (57.1%) and 23 (36.5%) respectively.

Liver function tests (ALT, AST, and Y-GT) revealed that 25 (63.4%), 31 (75.6%), and 18 (90.0%) had ALT of 0.0 to 31.0, AST of 4.0 – 32.0, and Y-GT of 5.0 to 39.0 respectively.

Over 90% of the participants had albumin levels that was below 35.0 g/L, 36 (94.7%); and 40 (63.5%) had platelet levels between 150.0 – 450.0 x 10^3/L.

There were 5 (17.9%) who tested positive for helicobacter pylori.

4.3 Etiology of upper gastrointestinal bleeding at MTRH

The endoscopic findings were as shown in Table 8.

Table 5: Endoscopic findings

Findings	n (%)
Duodenal ulcer	5 (10.6%)
Esophageal stricture	2 (4.3%)
Esophageal tumor	6 (12.8%)
Esophageal varices	6 (12.8%)
Gastric tumor	6 (12.8%)
Gastric ulcer	1 (2.1%)
Gastritis	8 (17.0%)
Gastroduodenal ulcer	1 (2.1%)
Gastroduodenitis	4 (8.5%)
Gastroesophageal varices	1 (2.1%)
Gastroesophagitis	1 (2.1%)
Mallory – Weis tear	3 (6.4%)
Normal OGD	3 (6.4%)

A total of 47 participants had endoscopy done.

There were 9 of the participants who died prior to conducting endoscopy and 7 (11.1%) were not done.

There was no endoscopy that was done within the recommended 24 hours.

No multiple pathologies were reported during this study such as concurrent gastritis and duodenal ulcer for example.

4.4 Common management modalities of patients with upper gastrointestinal bleeding at MTRH

The medications that were mainly administered included ethamsylate 53 (84.1%), PPIS (88.9%), ceftriaxone 44 (69.8%) and metronidazole 29 (46.0%)

Intravenous fluids were administered in 90.5% of the participants, and 37(58.7%) were transfused.

Table 6: Treatment administered

Variable	n (%)
Drugs	
Ethamsylate	53 (84.1%)
Octreotide	2 (3.2%)
PPIS	56 (88.9%)
Cefriaxone	44 (69.8%)
Metronidazole	29 (46.0%)
Fluids / blood used	
Crystalloids	57 (90.5%)
Blood transfusion	37 (58.7%)

Table 7: Definitive management

Management	n (%)
Medical	51(81%)
Open surgery	4 (6.3%)
Endoscopic intervention	8 (12.7%)

The definitive management methods after the diagnosis was made were open surgery, done for 4 (6.3%), and endoscopic intervention done for 8 (12.7%) of the participants.

Open surgery was for biliary leak following bypass surgery, perforated duodenal ulcer and bleeding gastric ulcer. Endoscopic interventions were sclerotherapy, stenting, banding and dilation.

The rest of the patients were taken care of conservatively (medical) 51 (81%).

4.5 Outcome of patients with upper gastrointestinal bleeding at MTRH

4.5.1 Outcomes

Control of the bleeding was achieved in 51 (81.0%) of the participants. However, there were 29 (46.0%) who re-bled either while in the ward or at re-admission. One fifth of the participants, 13 (20.6%), succumbed to the condition. The median duration of stay in the hospital was 10.0 (4.5, 21.5) days with a minimum and a maximum of 1.0 and 59.0 days respectively.

Table 8: Outcomes

Outcome	**n (%)**
Control of bleeding	51 (81.0%)
Re-bleeding	29 (46.0%)
Mortality	13 (20.6%)
Length of hospital stay (days)	10.0 (4.5, 21.5)
Range (Min. - Max.)	1.0 – 59.0

4.5.2 Time to death event

This is shown using the Kaplan-Meier Survival Function as shown in figure 1below.

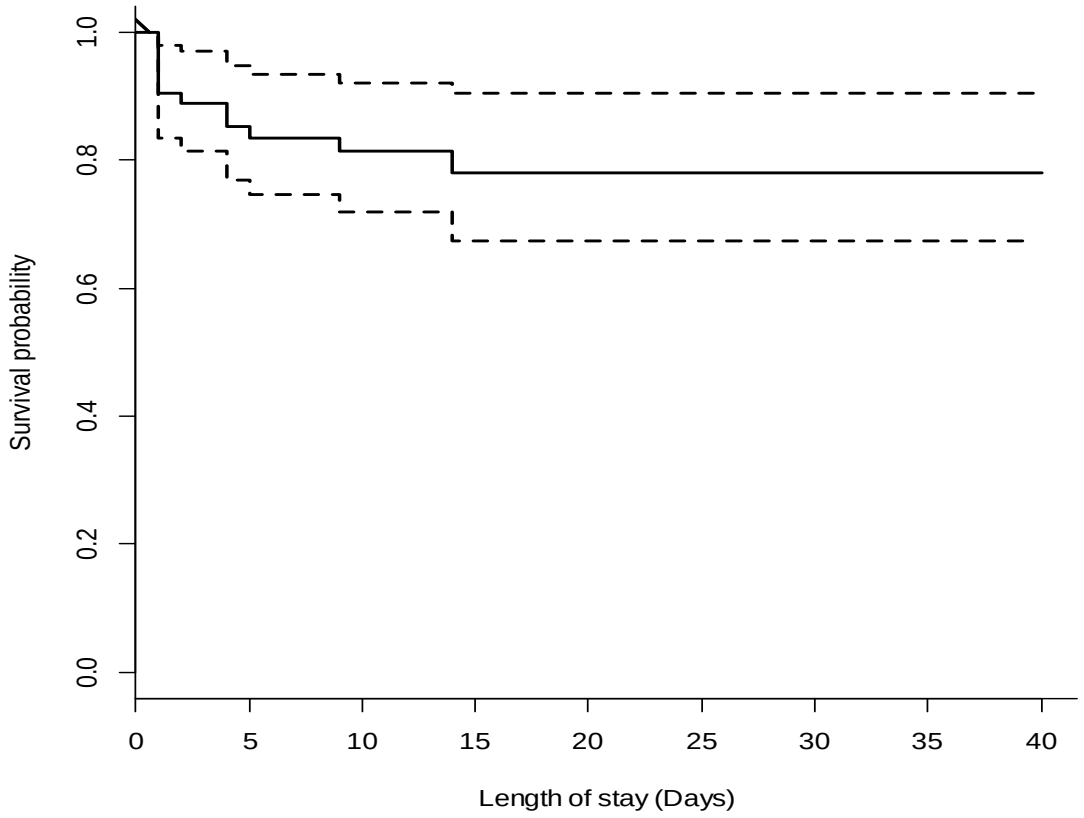

Figure 2: Kaplan-Meier Survival function

The death events occurred during the first 15 days with the death rate happening faster around the first 5 days.

4.5.3 Predictors of death

Independently, SBP > 90 mm Hg was associated with up to 83% reduced risk of death compared to those who had SBP <90 mm Hg, HR: 0.17 (95% CI: 0.05, 0.55), participants who had an infection with helicobacter pylori, were associated with almost 12 times increased hazard of death compared to those who had no such infection, HR: 11.65 (95% CI: 1.02, 129.70), and control of bleeding was associated with up to 95% reduced hazard of death compared to those who did not attain control, HR: 0.05 (0.01, 0.18).

After adjusting for SBP, and control of bleeding, helicobacter pylori was associated with more than 24 times increased hazard of death compared to those who had no helicobacter pylori, HR: 24.64 (95% CI: 1.43, 424.26).

Table 9: Cox regression model assessing the predictors of death

Variable	**Unadjusted HR (95% CI)**	**Adjusted HR (95% CI)**
SBP (>90 vs. ≤ 90) mm Hg	0.17 (0.05, 0.55)	**4.98 (0.20, 123.54**)
Helicobacter pylori	11.65 (1.02, 129.70)	**24.64 (1.43, 424.26)**
Control of bleeding	0.05 (0.01, 0.18)	0.10 (0.00, 2.04)

4.5.4 Predictors of control of bleeding

Participants who had higher pulse rate (>100 bpm) had up to 86% reduced odds of bleeding control, OR: 0.14 (95% CI: 0.03, 0.62). On the other hand, high SBP >90 mm Hg was associated with increased odds of controlling their bleeding, OR: 10.63 (95% CI: 2.86, 39.49).

Table 10: Logistic regression model assessing predictors of control of bleeding

Variable	**Unadjusted OR (95% CI)**	**Adjusted OR (95% CI)**
Pulse rate (>100 vs. ≤100) bpm	0.12 (0.03, 0.46)	**0.14 (0.03, 0.62)**
SBP (>90 vs. ≤ 90) mm Hg	12.30 (3.56, 42.53)	**10.63 (2.86, 39.49)**

4.5.5 Predictor of re-bleeding

Table 11: Association between platelets and Re-bleeding

Variable	Unadjusted OR (95% CI)
Platelets 150 – 450 vs. <150	0.29 (0.10, 0.81)
Platelets >450 vs. < 150	0.08 (0.01, 0.62)

Platelets count was the only covariate that was established to be associated with re-bleeding. The results show that participants with higher levels of platelets, 150-450, and >450, were less likely to re-bleed compared to those with platelets levels <150, OR: 0.29 (95% CI 0.10, 0.81), and 0.08 (95% CI: 0.01, 0.62) respectively.

CHAPTER FIVE: DISCUSSION

5.1 Socio-demographic characteristics

In this study 63 participants were recruited. The majority were male 45 (71.4%) giving a ratio of 1:2.5 female to male ratio. Up to 96.8% were unemployed relying on out of pocket payment. More than a third of the participants and close to half had a history of smoking and alcohol intake respectively.

5.2 Clinical presentation of patients with upper gastrointestinal bleeding at MTRH

The main presenting complaints were hematemesis, (95.2%), epigastric pain, (63.5%) and melena (55.6%). This is comparable to a study done in Iran that had hematemesis as the most common presentation (Mohammad et. al. 2010). The reason for this being that the method of capturing the patients based on their clinical presentation was comparable in the two studies. This however differs with a study done in Nigeria that had melena as the most common clinical presentation at 93.4% (Olusegun et. al. 2014). In Nigeria the study population consisted of patients who were undergoing endoscopy hence the reason for melena being the leading presentation.

Patients with hematemesis presented earlier

Tachycardia and hypotension were associated with reduced odds of controlling bleeding. This is due to the fact that by the time the patient develops these signs, the amount of bleeding is massive pointing towards a hemodynamically unstable patient. This is comparable to findings in KNH (Lule et. al. 1994).

Low hemoglobin level was not correlated with mortality. This contrasts with the same study in KNH (Lule et. al. 1994). This could have been attributed to the fact that the main problem of the patients was hemorrhage and not anemia primarily anemia. Therefore, once bleeding is controlled the anemia could be corrected. At the same

time the available red blood cells had their normal function still intact unlike other forms of low hemoglobin where they could be impaired.

Low platelet count was correlated with increased odds of re-bleeding. this pointed towards a prolonged bleeding time.

The low albumin count in over 90% of the participants who had liver function tests done could have pointed towards an underlying comorbidity. The point to note was there was no overt derangement of the albumin levels with any significant features of overt hypoalbuminemia.

5.3 Etiology of upper gastrointestinal bleeding at MTRH

Endoscopy was done for 47 (74.6%) of the patients as compared to 92.3% of the study in Nigeria (Olusegun et. al. 2014). Early mortality and financial constraints for some prevented access to endoscopy. The findings on endoscopy were gastroduodenal erosions 27.6%, gastroesophageal tumors 25.6%, varices 14.9% and ulcers 14.8%. A study done at KNH more than 20 years ago showed esophageal varices as the leading cause at 35% (Lule et. al. 1994). The differences in the catchment population could be the causes of the above differences and the passage of time that has led to improved diagnostics. The catchment population of KNH is near communities known to take alcohol in large quantities as well as being in the vicinity of Mwea irrigation scheme both of which have high incidence of liver diseases and hence variceal bleeds.

5.4 Common management modalities of patients with upper gastrointestinal bleeding at MTRH

Resuscitation was initiated upon presentation to hospital with 90.5% of patients receiving crystalloids and 58.7% having transfusion initiated. This is in line with guidelines that recommend immediate resuscitation to be initiated (NICE, 2014).

Majority of the patients had medical management at 81% of the patients. This contrasts with the findings in Nigeria that had 66.6% of patients undergoing medical management. (Olusegun et. al. 2014). The difference being the entry point in Nigeria being the endoscopy unit.

Endoscopic and open surgical managements were carried out for 12.7% and 6.3% respectively. Comparing with the same study in Nigeria, they had 21.6% undergoing endoscopic therapy and 11.8% surgical care (Olusegun et. al. 2014). The difference could be attributed to the recruitment process of patients in Nigeria where the entry point was patients undergoing endoscopy. This therefore meant that they ended up capturing a higher number of patients who required endoscopic therapy.

Those operated on had perforated duodenal or gastric ulcers. One patient required surgery for revision of an anastomosis that was causing severe biliary gastritis after a bypass surgery. Sclerotherapy and rubber band ligation of varices were the endoscopic interventions done.

5.5 Outcome of patients with upper gastrointestinal bleeding at MTRH

5.5.1 Control of bleeding

Control of bleeding was achieved for 81.0% of the participants. However, there were 46.0% who re-bled either while in the ward or at re-admission. This was higher than the 11.3% reported at KNH (Lule et. al. 1994).

Platelets count was the only covariate that was established to be associated with re-bleeding. A low platelet count predisposed to high odds of re-bleeding. Therefore, there is need to monitor the platelet count in the management of these patients. Thrombocytopenia was not related to chronic liver disease or varices in the study. It did not appear as a direct cause of upper gastrointestinal bleeding since no patient presented with the clinical features associated with it other than hematemesis. Treatment of underlying cause (not related to thrombocytopenia) controlled the bleeding.

Participants who had deranged clinical signs as evidenced by elevated pulse rate or low blood pressure had reduced odds of bleeding control. Derangement of these clinical signs has been shown to be related with a poor outcome (Lule et. al. 1994).

5.5.2 Mortality

Mortality rate was 20.6%. This was higher than the mortality rate reported in other studies around the world of 10% (Colin 2013; Hiroshi et. al. 2015; Marinos et. al. 2013; Mohammad et. al. 2010; Olusegun et. al. 2014). Half of the deaths had no definitive diagnosis since they had not undergone endoscopic investigation. The study done in Nigeria had been shown to have a low mortality of 5.9% because 92.3% of their study subjects underwent endoscopic diagnosis with endoscopic therapy where indicated (Olusegun et. al. 2014). All those who died had at least an episode of re-bleeding. The high number of patients reported to have undergone endoscopy in

Nigeria might be attributed to the fact that the catchment population was mainly in the endoscopy unit.

Using Kaplan-Meir survival function, death events were shown to have occurred during the first 15 days with the death rate happening faster around the first 5 days. This gives a period within which the care givers need to be vigilant in monitoring and optimizing the patient care to lower this mortality. This includes but not limited to adequate initial resuscitation and timely endoscopy services, within 24 hours (NICE 2014).

Participants with normal blood pressure had a reduced risk of death. Therefore, patients' initial hemodynamic presentation has a bearing on the subsequent outcome. Control of bleeding was associated with less risk of death. Participants who tested positive for *H. pylori* were associated with almost 12 times increased hazard of death compared to those who had no such infection. However, the number of patients who underwent *H. pylori* testing was low resulting in very wide confidence limits. However, it is recommended that patients get eradication therapy for *H. pylori* despite the test results since there are many incidences of false negative results in the setting of acute bleeding (Lu et. al. 2014). This has been the practice locally especially upon discharge.

5.5.3 Length of hospital stay

The median duration of stay in the hospital was 10.0 (4.5, 21.5) days with a minimum and a maximum of 1.0 and 59.0 days respectively. This was longer than that recorded for in the study done in Nigeria (Olusegun et. al. 2014). The length of stay was much shorter in Nigeria due to early use of endoscopy. This contrasts with our setting where no endoscopy was done within 24 hours.

The other factor contributing to long hospital stay was availability of blood for transfusion that kept patients waiting as well as availability of finances for various hospital bills.

5.6 Study Limitations

There were some reported study limitations. These included:

1. Inability to use the clinical findings conclusively such as pallor since most of the patients had an acute presentation for which vital parameters were more appropriate to use.
2. The coagulation profile was not routinely done for the patients hence not able draw correlations between parameters such as INR and outcome.
3. Not all study participants had endoscopy done. This was due to financial constraints as well as some having mortality events occur prior to endoscopy being done. Lack of endoscopy within 24 hours also contributed to this.

CHAPTER SSIX: CONCLUSIONS AND RECOMMENDATIONS

6.1 Conclusions

The leading causes of upper gastrointestinal bleeding in patients seen at Moi Teaching and Referral Hospital included gastroduodenal erosions, gastroesophageal tumors, peptic ulcer disease and varices in order of reducing frequency.

The main presenting complaints were hematemesis, epigastric pain and melena which had a duration of 1 -150 days.

Definitive management was open surgery, endoscopic intervention and medical care.

Regarding the outcome, control of bleeding was achieved in 81% of the participants, 46% had at least one episode of re-bleeding and 20.6% succumbed to the condition.
Thrombocytopenia was an important risk factor for re-bleed.
The median length of hospital stay was 10.0 days.

6.2 Recommendations

1. High index of suspicion on etiology of upper gastrointestinal bleed being a tumor.
2. Measures to be put in place to mitigate the high morbidity and mortality by using the mentioned predictors in clinical practice such as thrombocytopenia and appropriate primary diagnosis of bleeding.

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APPENDICES

Appendix I: Questionnaire

1. INITIALS _____

2. AGE _____ **(years)**

Gender: Male ☐ Female ☐

Address _____

I.P. No. _____

Occupation (SES) _____

Residence _____

Contacts _____

3. Date of admission

Date _____

4. Duration of symptoms before presenting to hospital

_____ Days

5. Patient's complaints

	YES	NO
Hematemesis	☐	☐
Melena	☐	☐
Epigastric pain	☐	☐

Others

……

……

6. Clinical evaluation

General exam

Palor : none ☐ mild ☐ moderate ☐ ☐
severe

Jaundice none ☐ mild ☐ moderate ☐ ☐
severe

Skin : bruises ☐

Hemodynamics

PR : _____ beats/minute

BP : _____ mmHg

Systemic exam……
……
……..

7. Emergency medications in outpatient or point of entry

	YES	NO	DOSAGE IF GIVEN
a) Etamsylate/tranexamic acid	☐	☐	_____
b) Terlipressin	☐	☐	_____
c) Octreotide	☐	☐	_____
d) Resuscitation	☐	☐	

e) Others

……
……
……

If resuscitation, indicate:

	Fluids used	Amount
Normal saline	☐	…….
Ringers lactate	☐	…….
Dextran	☐	……...
Blood	☐	……..

Others

……
…….

8. Investigations done in outpatient

Hemoglobin _____ mg/dl

Hematocrit _____

Red blood cell count _____

Grouping and cross-matching_____

9. Other laboratory investigations done

Liver Function Tests : AST_____

ALT_____

Y-GT_____

Albumin : _____

Full hemogram : wbcs_____

Rbcs_____

Hb_____

Plt_____

H. pylori : pos ☐ neg ☐

Occult blood in stool :_____

Others

……

……

……

……

10. Endoscopy

ENDOSCOPY	**YES**	**NO**	**IF INDICATED, WAS IT**	
			DONE	**NOT DONE**
Indicated immediately on admission (in severe bleeding)				
Offered within 24 hours of admission				
Others				

Endoscopic findings

a) Duodenal ulcer ☐
b) Gastric ulcer ☐
c) Esophageal varices ☐
d) Esophagitis ☐
e) Gastritis ☐
f) Duodenitis ☐
g) Upper GI malignancy ☐
h) Blood in the stomach ☐
i) Mallory-Weiss tear ☐

Others……
……
……
……
……

11. Medications given in the ward

a) Vasoactive agents (somatostatin, terlipressin, octreotide)

Drug	**Date& time started**	**Dosage**	**Duration**

b) Antibiotics

Drug	**Date & time started**	**Dosage**	**Duration**

c) Proton Pump Inhibitors

Drug	**Date& time started**	**Dosage**	**Duration**

d) Other antacids

Drug	**Date & time started**	**Dosage**	**Duration**

12. Open surgical management

Was surgery indicated? **YES** ☐ **NO** ☐

If YES, indicate the indication……
……

Type of surgery done
……
……

Outcome of surgery
……
……

13. Endoscopic management

Was endoscopic management done? **YES** ☐ **NO** ☐

If YES, what is the indication……
……

Type of endoscopic management done……
…….

……
……..

Outcome of endoscopic management……
……

Diagnosis

Working diagnosis :_____

Definitive diagnosis made **YES** ☐ **NO** ☐

If **YES;** indicate the diagnosis:_____

If **NO;** what is the

reason……

……

……

……

……

14. Outcome after admission

a) Control of bleeding YES ☐ NO ☐

b) Re-bleeding YES ☐ NO ☐

If YES, indicate number of re-bleed:_____Date_____

Time_____am ☐ pm ☐

c) Mortality YES ☐ NO ☐

If YES, Date_____Cause_____

Time_____am ☐ pm ☐

15. Date of discharge

Date_____ time _____am ☐ pm ☐

16. Length of hospital stay

_____ In days

17. Outcome after discharge or 15 days

a) Re-bleeding YES ☐ NO ☐

If YES; place_____ time_____

b) Re-admission YES ☐ NO ☐

c) Mortality YES ☐ NO ☐

If YES; place _____ Date_____

Appendix II: Consent Form (English Version)

My name is Dr. Naftaly Munene. I am a qualified medical doctor, registered by the Kenya Medical Practitioners and Dentists Board (Registration number A7392). I am currently pursuing a Master's Degree in General Surgery at Moi University. I would like to recruit you into my research which involves studying of adults admitted with upper gastrointestinal bleeding with aim of determining the etiology, management and outcome of the condition.

INFROMATION ABOUT UGIB

Upper gastrointestinal bleeding is vomiting of blood or passing black stools due to a problem in the part of gastrointestinal tract such as stomach, esophagus etc. It is a problem that devastates the person and strains medical provision. The information will be useful for us as medical experts and even the policy makers to understand and manage the problem.

Your information will be kept confidential and you will be informed of the results and what they mean. Your treatment will not be affected in any way by your participation in the study.

This study has been approved by the Institutional Research and Ethics Committee (IREC) of Moi University/Moi Teaching and Referral Hospital.

If you need further clarification please contact IREC using the address below.

The Chairman IREC
Moi Teaching and Referral Hospital
P.O. Box 3
Postal code 30100
Eldoret.
Tel: 33471/2/3

CONSENT

I have been asked to allow myself/my relative to participate in a study to determine the etiology, management and outcome of upper gastrointestinal bleeding in adults managed at MTRH. I have been informed that I/my relative will be given the best treatment according to current knowledge on management of the condition.

I have been assured that I/my relative are free to withdraw from the study at any time and still be treated at the hospital. I have also been assured of that information regarding the treatment in the study will be kept confidential. I have understood the foregoing and hereby give consent for myself/my relative to participate in the study.

Signature of self/relative/guardian…….

Investigator……..

Date……..

Ombi la idhini

Jina langu ni Dr. Naftaly Munene. Nimehitimu kama daktari na kusajiliwa na Bodi ya kusajili Madaktari Kenya (nambari ya usajili A7392). Kwa sasa mimi ni mwanafunzi wa shahada ya juu (masters) ya upasuaji kwa jumla (General Surgery); Chuo Kikuu cha Moi. Ningependa ujiunge na utafiti ninaofanya kuhusu kutapika damu na kwenda haja kubwa yenye ni nyeusi kati ya watu ambao hutafuta matibabu hospitali ya rufaa ya Moi Eldoret.

MAELEZO KUHUSU KUTAPIKA DAMU

Kutapika damu (au kwenda haja kubwa yenye ni nyekundu) ni ugonjwa unaotokana na hitilafu katika sehemu ya kupitishia chakula kama vile tumbo, koromeo na kadhalika. Matokeo ya utafiti huu yatakuwa ya manufaa kwa madaktari katika kuboresha matibabu ya ugonjwa huu na pia kwa serikali katika kuweka mikakati ya kusaidia katika suluhu ya shida hii.

Matokeo ya utafiti yatahifadhiwa vyema na utajulishwa maana yake. Matibabu yako hayataathiliwa kwa vyovyote vile na kujiunga kwako.

Uchunguzi huu umeruhusiwa na Kamati ya uchunguzi wa wasomi na haki za wanaoshiriki katika uchunguzi (Institutional Research and Ethics Committee) ya chuo kikuu cha Moi na Hospitali kuu ya Moi.

Ukihitaji maelezo zaidi, wasiliana na IREC kupitia:

Mwenyekiti IREC,

S.L.P. 3 – 30100.

Eldoret

Nambari ya simu 33471/2/3

IDHINI YA KUSHIRIKI

Mimi au jamii yangu nimeridhia kushiriki katika utafiti ambao unatathmini kinacho sababisha, utabibu na matokeo ya mtu kutapika damu au kuwa na choo cheusi aendapo haja kubwa pamoja na matokeo ya matibabu. Tathmini ya mambo haya yatapambanuliwa kwa kufuatilia mgonjwa tokea alazwe hadi kuachiliwa kwangu au jamii yangu na kwa hadi siku kumi na nne. Nimefahamishwa matibabu ni hiari yangu au jamii yangu na naweza kujitoa katika utafiti huu wakati wowote. Nimehakikishiwa ya kwamba uchunguzi hautasababisa hatari kwa afya yangu wala jamii yangu wala utambuzi kudhihirishwa kutoka rekodi zangu na uvumbuzi kuhusu utafiti wangu na matibabu zitabaki siri.

Sahihi yangu/jamii yangu……

Mtafiti …….

Tarehe ……

Appendix III: IREC Approval

INSTITUTIONAL RESEARCH AND ETHICS COMMITTEE (IREC)

MOI TEACHING AND REFERRAL HOSPITAL
P.O. BOX 3
ELDORET
Tel: 33471/2/3

MOI UNIVERSITY
SCHOOL OF MEDICINE
P.O. BOX 4606
ELDORET

Reference: IREC/2015/137.
Approval Number: 0001457.

10th August, 2015

Dr. Naftaly Munene Njeru,
Moi University,
School of Medicine,
P.O. Box 4606-30100,
ELDORET-KENYA.

INSTITUTIONAL RESEARCH & ETHICS COMMITTEE
10 AUG 2015
APPROVED
P.O. Box 4606-30100 ELDORET

Dear. Dr. Njeru,

RE: FORMAL APPROVAL

The Institutional Research and Ethics Committee has reviewed your research proposal titled:-

"Etiology Management and Outcome of Upper Gastrointestinal Bleeding in Patients Seen at Moi Teaching and Referral Hospital."

Your proposal has been granted a Formal Approval Number: ***FAN: IREC 1457*** on 10th August, 2015. You are therefore permitted to begin your investigations.

Note that this approval is for 1 year; it will thus expire on 9th August, 2016. If it is necessary to continue with this research beyond the expiry date, a request for continuation should be made in writing to IREC Secretariat two months prior to the expiry date.

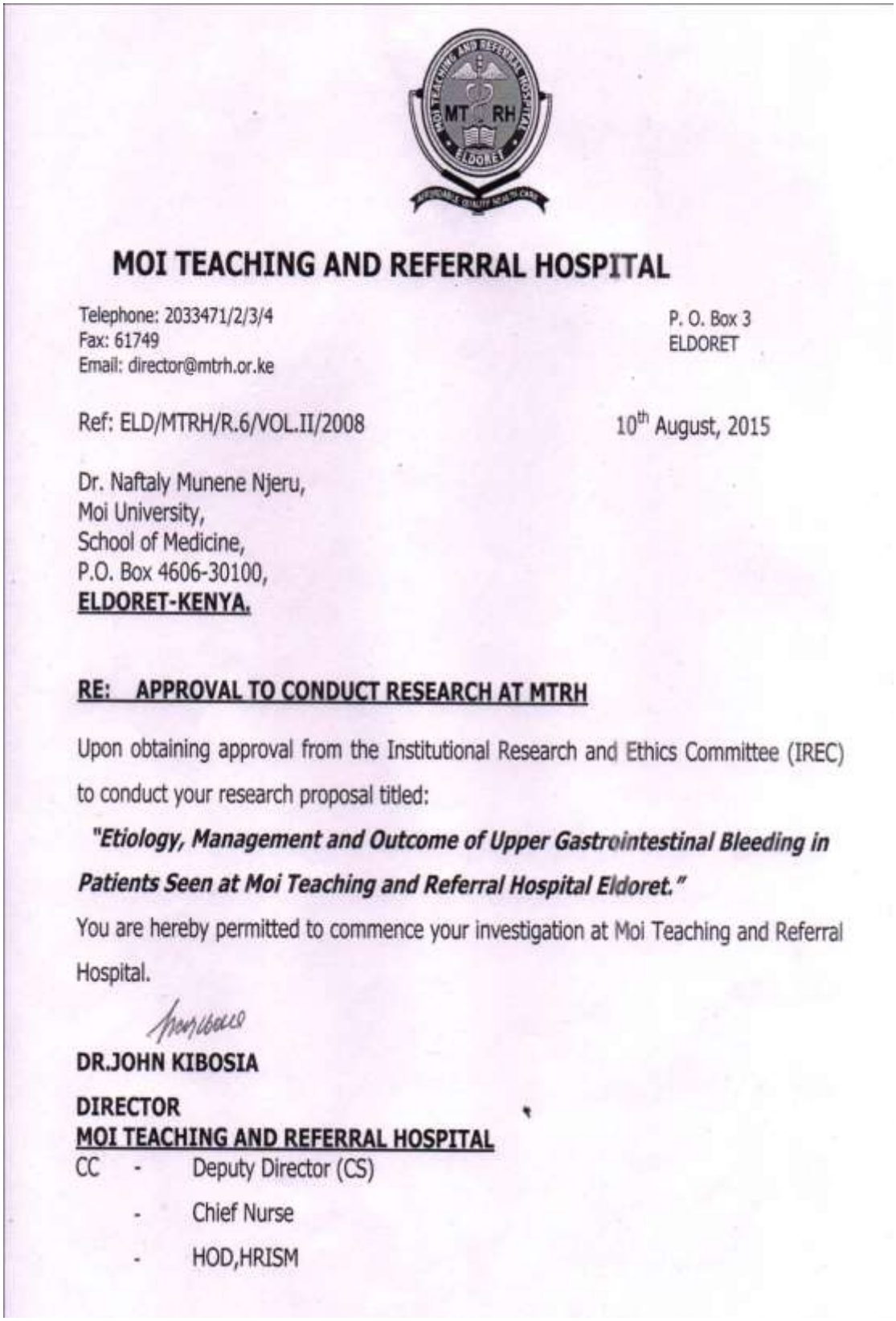
You are required to submit progress report(s) regularly as dictated by your proposal. Furthermore, you must notify the Committee of any proposal change (s) or amendment (s), serious or unexpected outcomes related to the conduct of the study, or study termination for any reason. The Committee expects to receive a final report at the end of the study.

Sincerely,

PROF. E. WERE
CHAIRMAN
INSTITUTIONAL RESEARCH AND ETHICS COMMITTEE

cc Director - MTRH Dean - SOP Dean - SOM
Principal - CHS Dean - SON Dean - SOD

Appendix IV Hospital Approval



MOI TEACHING AND REFERRAL HOSPITAL

Telephone: 2033471/2/3/4
Fax: 61749
Email: director@mtrh.or.ke

P. O. Box 3
ELDORET

Ref: ELD/MTRH/R.6/VOL.II/2008

10th August, 2015

Dr. Naftaly Munene Njeru,
Moi University,
School of Medicine,
P.O. Box 4606-30100,
ELDORET-KENYA.

RE: APPROVAL TO CONDUCT RESEARCH AT MTRH

Upon obtaining approval from the Institutional Research and Ethics Committee (IREC) to conduct your research proposal titled:

"Etiology, Management and Outcome of Upper Gastrointestinal Bleeding in Patients Seen at Moi Teaching and Referral Hospital Eldoret."

You are hereby permitted to commence your investigation at Moi Teaching and Referral Hospital.

DR.JOHN KIBOSIA

DIRECTOR
MOI TEACHING AND REFERRAL HOSPITAL

CC - Deputy Director (CS)
- Chief Nurse
- HOD,HRISM