UGANDA MARTYRS UNIVERSITY MOTHER KEVIN POSTGRADUATE MEDICAL SCHOOL NSAMBYA DYSPEPSIA AT ST FRANCIS HOSPITAL, NSAMBYA.

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DEDICATION

I dedicate this work to My Beloved Parents Mr Aggrey Izio Tata(late) and Mrs.Grace Baguma Izio for their love, understanding and overwhelming support morally and financially. Without whom I wouldn't have made it this far.

To my siblings Francis, Mathew, Leah, Carol and Henrietta for their unwavering belief in my abilities and never ending encouragement.

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OPERATIONAL DEFINITIONS

DYSPEPSIA-consists of a heterogenous group of symptoms that are localised to the epigastric region, broadly defined as pain or discomfort in that is centred in the upper abdomen. and includes one more of the following symptoms bothersome postprandial fullness, early satiety, epigastric pain and burning sensation.

EARLY SATIATION- Early satiety is the inability to eat a full meal or feeling full after only a small amount of food.

POSTPRANDIAL FULLNESS- Postprandial fullness is defined as an unpleasant sensation like prolonged persistence of food in the stomach.

EPIGASTRIC PAIN-Pain that is localized to the region of the upper abdomen below the ribs.

EPIGASTRIUM- The region between the umbilicus and the lower end of the sternum, and is marked by the midclavicular lines laterally.

GASTRITIS- Inflammation of the lining of the stomach

METAPLASIA- transformation of one differentiated cell type to another differentiated cell type.

DYSPLASIA-from Ancient Greek dys-, "bad" or "difficult" and plasis, "formation") is an ambiguous term used for an epithelial anomaly of growth and differentiation (epithelial dysplasia). It is a DNA injury that is graded from 1-3. Which is a precursor for malignant neoplasm.

FUNCTIONAL DYSPEPSIA- . Functional dyspepsia is defined as “upper abdominal or retrosternal pain or discomfort, heartburn, nausea or vomiting or other symptoms considered to be referable to the proximal alimentary tract and lasting for more than 4 weeks, unrelated to exercise and for which no focal lesion or systemic disease can be responsible (JAPI 2012)

NEGATIVE ENDOSCOPY- Symptomatic patients presenting for endoscopy and Normal Mucosal findings noted at endoscopy.

SENIOR ENDOSCOPIST-A specialist who has done endoscopy for over 5years

SENIOR PATHOLOGIST- A specialist of pathology for over 5years.

ABBREVIATIONS

PPIs- Proton pump inhibitors

TCAs- Tricyclic antidepressants

CSFs- Clinically significant upper gastrointestinal findings

ABSTRACT

Background: Dyspepsia is one of the commonest occurring gastrointestinal disorders in our region with a Global prevalence of between 7-45% and a regional prevalence of 65%. Most studies on dyspepsia have differences in findings and proposed standard of care. The current practices in our setting are centered on investigations and initial treatment with PPIs and antibiotics before referral for endoscopy and biopsy. This study is to describe the commonest presenting complaints, endoscopy and histopathology findings in patients with dyspepsia in our setting.

Objectives: To describe the endoscopy findings and histopathology findings in patients with dyspepsia.

Methods: A descriptive cross-sectional study in which 115 dyspeptic patients who presented to St Francis hospital, Nsambya underwent endoscopy and biopsy. Consecutive sampling was used and data was entered in a preformed questionnaire. Ethical approval for the study was got from the Hospital and University Research and Ethics committees and written consent was got for all the participants in this study. Data collected was entered into Microsoft Excel and analyzed with STATA version 14.0

Results: Dyspepsia prevalence was more among the male at 53.9% than the female at 46.1%. The mean age of participation in this study was 53years. The commonest presenting complaint was epigastric pain which was noted in 63.6% of the participants followed by hematemesis in 14.3% and vomiting feeds in 6.4%. Most of the patients at presentation had only one clinical symptom (80.9%) while those with more than one presenting symptom were (19.1%). There was no relationship between the age and sex and the presenting complaints among patients with p= 0.290 and p= 0.680 respectively. The commonest findings at endoscopy were gastritis- 73 participants, followed by PUD- 23, Duodenitis- 22, GERD-17, Oesophagitis—15, Tumor-11, Hernia-9, Polyps-4. No normal findings were noted at endoscopy. At histology, there was no reported normal mucosa, the most common finding was gastritis in 62.6% of the patients. 10.4% participants had gastric malignancy and 1.7% had intestinal metaplasia. Histopathology findings across age and sex were not significantly different. However, in 3 patients, diagnosed with Peptic ulcer disease at endoscopy, 2 had intestinal metaplasia and one had gastrointestinal stromal tumor at histology. The concordance rate between endoscopy and histology was 76.9%

Conclusion: From our study, the commonest finding described at Endoscopy was Gastritis at 42% while at histopathology, the commonest finding was it would be beneficial for patients with dyspepsia who undergo endoscopy to have biopsies taken off for histopathology.

CHAPTER ONE

1.1 INTRODUCTION

Dyspepsia is a Greek word meaning “duis” (bad or difficult) and “peptin” (to digest), which is described by patients as indigestion; both these words are a poor expression, as dyspepsia has no relation to digestion of food.(JAPI 2012)

Dyspepsia is any combination of four symptoms: postprandial fullness, early satiety, epigastric pain, and epigastric burning that are severe enough to interfere with the usual activities and occur at least 3 days per week over the last 3 months with an onset of at least 6 months in advance (ROME IV CRITERIA- 2016)

Symptom prevalence differs in different populations depending upon the prevalence of Helicobacter pylori infection, environmental factors like drug-alcohol- tobacco intake and dietary spices.(JAPI 2012)

Symptoms of dyspepsia include: abdominal pain above umbilicus, retrosternal burning, regurgitation, belching (or eructation), abdominal distension (fullness), nausea, vomiting (occasional), early satiety after meals. Symptoms of dyspepsia are divided into reflux-type (retrosternal burning, regurgitation), ulcer-type (epigastric pain on empty stomach relieved with bland food, antacids or acid suppression drugs), dysmotility-type (postprandial fullness, distension, early satiety, nausea). Rome IV criteria divided functional dyspepsia in 2 groups : (i) predominant epigastric pain or burning (the epigastric pain syndrome) and (ii) early satiety or fullness following a meal (the postprandial distress syndrome)(JAPI 2012).

The global prevalence of dyspepsia ranges from 7-45% (Mahadeva and Goh, 2006). With an East African regional prevalence of 65% (Shmuely et al., 2003).

Approximately 25 percent of patients with dyspepsia have an underlying organic cause. However, up to 75 percent of patients have functional (idiopathic or non-ulcer) dyspepsia with no underlying cause on diagnostic evaluation (Longstreth et al., 2013).

The current updated American College of Gastroenterology (ACG) and the Canadian Association of Gastroenterology (CAG) guidelines on dyspepsia management are dependent on age, symptomatology, and the cause (Moayyedi et al., 2017).

Patients ≥60 years of age presenting with dyspepsia are investigated with upper gastrointestinal endoscopy to exclude organic pathology. Those younger patients with higher risk patients for malignancy and alarm features are also done upper GI endoscopy. Helicobacter pylori (H.Pylori) test is also done and treatment started if positive. The use of PPIs, TCAs, Prokinetics in patients with negative H.pylori test results and those with no pathology at endoscopy.

The common practice in our setting is initial management of symptoms and consideration of further investigation and endoscopy evaluation at a later stage or not at all unless symptoms persist or patients have associated alarm symptoms.

When these symptoms progress on to chronic gastritis, there are varying degrees of superficial and glandular epithelial damage leading to parenchymal atrophy. It is associated with dyspepsia in 50% of cases but more so with gastric and duodenal ulcers.

Ideally if a patient doesn't improve on first line medical treatment, an upper GI endoscopy would be recommended and a preliminary biopsy maybe taken at this time.

Upper GI Endoscopy is a common procedure carried out for evaluation of patients with dyspepsia, and often a biopsy is taken in organic dyspepsia and on encounter with normal looking gastrointestinal mucosa (functional dyspepsia), non-invasive management (medication) is opted for.

1.2 PROBLEM STATEMENT

According to Out Patient Department records, approximately 300 Patients present to Nsambya hospital monthly with complaints of dyspepsia. A third of these patients when sent for an upper GI endoscopy, will be found to have normal looking mucosa or to have a gastritis and at this initial encounter biopsies are not taken off.

In the current era of malignancy, and with the presence of the Oncology department at St Francis Nsambya, it has been observed that the number of patients presenting with gastric malignancy is

on the increase and a good number of these patients have had an initial endoscopy with normal looking mucosa and no biopsy taken off at that initial encounter.

Currently at our endoscopy unit, not all patients who present with dyspepsia are biopsied, except for those presenting with abnormal looking mucosa.

Endoscopically normal mucosa may not be normal at biopsy as it has been observed that some of the patients with normal mucosa endoscopically present later with significant mucosal changes (Emara et al., 2017).

Also following the procedure, patients that are found to have negative endoscopies are sent back to the referring physician for further evaluation and medication.

1.3 JUSTIFICATION OF THE STUDY

According to a study done by Mahadeva and Goh (2006) the global prevalence of undiagnosed dyspepsia ranges between 7%-45% depending on definition used and geographical location .

Vaira et al. (1990), noted that endoscopy alone has the poorest sensitivity (37.1 %) and specificity (53.3%). At histology, patients with endoscopically normal mucosa, would have confirmed gastritis at histopathology and therefore patients with normal endoscopic appearances would benefit from biopsy and further evaluation. This study has shown that endoscopy is unhelpful in dyspeptic patients if endoscopic biopsies are not routinely taken.

Sipponen and Stolte (1997), in Finland, found that routine biopsy even for normal looking mucosa may reveal special forms of Gastritis and associated microscopic changes.

A study done in Egypt showed that Endoscopy alone is insufficient in diagnosing the cause of dyspepsia. It may miss serious mucosal premalignant gastric lesions in about 15 to 30% of cases that can be picked up later on by histological examination (Dawod and Emara, 2016). This could be late for the patient since if these are picked up early, appropriate medication and follow up would be initiated.

Although St Francis Hospital has a functional endoscopic unit, the patients who have been examined endoscopically and biopsies taken off have not been characterized, the lesions that are seen at endoscopy have not been characterized.

In view of that, the study was conducted with the assumption that;

- It would be a source of documentation of the patients examined endoscopically and histologically, describing all the different findings.
- It would help set guidelines for taking biopsy at endoscopy of patients presenting with dyspepsia.
- Describe the common histology findings and also set follow up guidelines for patients who present with positive histology at biopsy
- It would be a source of information for policy for the gastroenterologist

1.4 RESEARCH QUESTION.

What are the endoscopic and histopathological findings in patients with dyspepsia who present for endoscopy at St Francis Hospital, Nsambya?

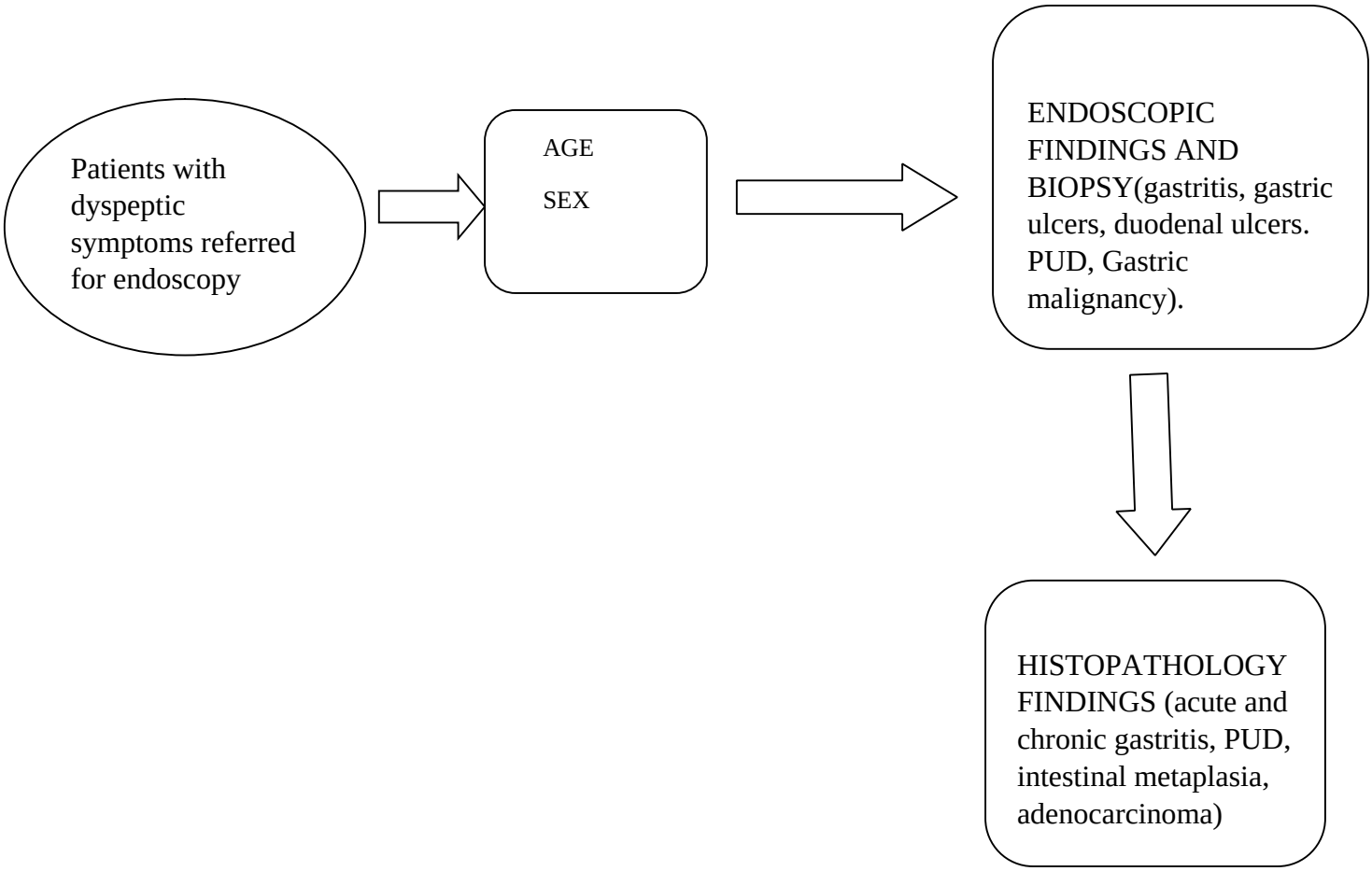
1.5 STUDY OBJECTIVES

1.5.1 GENERAL OBJECTIVE

To describe the endoscopic and histopathological findings in patients with dyspepsia at Nsambya?

1.5.2 SPECIFIC OBJECTIVES

- To describe the endoscopic findings in patients with dyspepsia.
- To describe the histopathological findings among patients presenting with dyspepsia.



1.6 STUDY FLOW CHART

Figure 1. Study flow chart showing patients referred for endoscopy with biopsies taken and histopathological findings noted.

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

Evaluation of dyspeptic symptoms by use of endoscope started in the 1900s in many centers in America, Europe, Asia and parts of Africa. Advancement in the evaluation of the gastrointestinal tract has been ongoing since the golden endoscopy era 1968-1990 (Sivak, 2006).

Dyspepsia refers to pain or discomfort in upper abdomen. It occurs in about 25% of Swedish population , and is seen in 5% of outpatient visits (Agreus, 2002). The East African regional prevalence of dyspepsia is 65% as stated by a study done in Kenya by Shmuely et al. (2003). There is minimal research on the disease burden of dyspepsia in Uganda.

In a study done by Kapadia (2003) in USA, gastric carcinoma of the intestinal type originates from dysplastic epithelium, which in turn develops from pre-existing atrophic gastritis and intestinal metaplasia. They further stated that the main causes of chronic atrophic gastritis and gastric atrophy are autoimmune due to pernicious anaemia or chronic Helicobacter pylori infection. In pernicious anaemia, there is severe atrophy of the corpus, with the antrum being spared whereas, chronic atrophic gastritis due to chronic H. pylori infection is a multifocal pangastritis, involving independent foci in the corpus and antrum of the stomach. Walker (2003), noted that intestinal metaplasia is a risk factor for the development of intestinal type gastric carcinoma and further stated that patients with intestinal metaplasia should be closely followed up and treated on antioxidants and h. pylori eradication .

Intestinal metaplasia can be graded as: enteric (grade I), enterocolic (grade II) and colonic (grade III) type, which is thought of as the most sinister variety (Kapadia, 2003).

Thomson et al. (2003) concluded that Dyspepsia sub-classifications based on dominant symptom are of limited value in predicting the presence and nature of CSFs. Esophagitis was by far the most common diagnosis (43% of patients). CSFs were common in uninvestigated dyspeptic patients and their nature suggests patients could be initially treated effectively, without endoscopy, using empirical acid suppressive therapy.

Later studies, however, have noted the significance of endoscopic evaluation and histopathological diagnosis in patients presenting with dyspepsia. Dinesh et al. (2015) in India noted that the findings at endoscopy for young patients with chronic dyspepsia were insignificant but recommended endoscopy as an early diagnostic tool for upper GI Malignancy especially in the elderly population, which was reiterated by Nayak et al. (2016), who also noted that patients with dyspepsia who are older than 50 years of age and/or those with alarm features should undergo endoscopic evaluation .

In an Egyptian study titled histopathological assessment of dyspepsia in the absence of endoscopic mucosal lesions by Dawod and Emara (2016), it was found that endoscopy examination without histology is insufficient in mucosal lesion evaluation in about 15 to 30% of cases, stating that biopsy is a convenient procedure for accurate assessment and diagnosis of premalignant gastric lesions. Likewise in Sweden, Redéen et al. (2003) also emphasized the role of histopathological examination in evaluating gastric lesions . .

2.2 Dyspeptic symptoms

Dyspepsia consists of a heterogeneous group of symptoms that are localized in the epigastric region. It can be broadly defined as pain or discomfort that is centred in the upper abdomen (particularly the epigastrium). Functional dyspepsia, which is one of the most common gastrointestinal disorders encountered in clinical practice, is defined by the Rome IV criteria in 2016 as the presence of chronic dyspeptic symptoms in the absence of underlying structural or metabolic disease that readily explains the symptoms (Stanghellini, 2017).

In a study carried out in Japan, Min et al. (2014), noted a high prevalence of uninvestigated dyspepsia and how it greatly impaired the quality of life of the people affected .

According to a study done in Eastern Uganda, the commonest presenting complaint was epigastric pain reported in 87% of patients (Lee et al., 2019). Likewise, Dawod and Emara (2016) also noted epigastric pain and epigastric burning were the most common presentation of the studied patients (42% and 25.7%) respectively.

Dyspeptic symptoms typically include epigastric pain, sensations of pressure and fullness, nausea, and early subjective satiety. The etiology of the disorder is heterogeneous and multifactorial.

Contributory causes include motility disturbances, visceral hypersensitivity, elevated mucosal permeability, and disturbances of the autonomic and enteric nervous system (Madisch et al., 2018).

2.3 Endoscopic findings in patients with dyspepsia.

According to the American society of gastroenterology(ASGE), much as dyspepsia without alarm features is not an absolute indication for endoscopy, doing an endoscopy may facilitate the diagnosis of structural disorders in a small subset of patients (Aasma Shaukat et al., 2015).

A study done by Kagevi et al. (1989), stated that open-access endoscopy is a valuable service to primary care, the result of which greatly enhances the diagnostic accuracy in dyspeptic patients entering primary care.

Endoscopy as a modality in the management of dyspepsia date back as early as the 1980s, a study done by Williams et al. (1988), Abnormal findings were more common in older than younger dyspeptic patients 58% to 40% at endoscopy and furthermore, 5% of patients above 45years were diagnosed with malignant conditions at endoscopy .

A study done by Oling et al. (2015), noted that patients with dyspeptic symptoms on average accessed endoscopy services after 57 weeks following the onset of symptoms and significant findings were found on endoscopy without presence of alarm symptoms .

An Indian study by Amar and Naik (2019), found that endoscopy is an important tool both for screening and diagnosis of organic causes of dyspepsia, benign and early detection of malignant lesions.

Heidarloo et al. (2019), noted that endoscopy plays a vital role in determining severity of lesions which may not readily be distinguished from history and physical examination. Likewise, a Pakistan study by Mehmood et al. (2011), stated that Upper GI endoscopy is a useful diagnostic modality in elucidation of the causes of dyspepsia. They noted that the commonest findings at endoscopy in their study were Gastro-duodenitis, oesophagitis, peptic ulcer disease and hiatus hernia.

Wankhade et al. (2018), noted from their study that, Inflammatory change was the commonest endoscopic finding associated with dyspepsia, and in >40% of cases, dyspepsia was attributed to H. pylori infection.

2.4 Histopathological findings among patients with dyspepsia

Findings at histopathology in patients with dyspepsia vary from benign inflammatory conditions to premalignant and malignant lesions.

The most common finding at histopathology is gastritis as noted by several studies done regionally and globally. According to The Updated Sydney system of classification of gastritis, biopsy samples are taken from the antrum, corpus and the incisura angularis (Stolte and Meining, 2001). Sipponen and Stolte (1997), stated that microscopic evaluation of biopsy specimen, gives information about the grade, extent and topography of gastric related and atrophy related lesions in the stomach

In Egypt, Emara et al. (2017), found that in absence of gross features and apparently normal upper GI endoscopy, mucosal biopsy found high prevalence of gastric mucosal inflammation, likewise, Dawod and Emara (2016), found significant mucosal changes at biopsy including, glandular atrophy and mild degree of intestinal metaplasia seen in 6 female patient .

Patients found with a histopathological diagnosis of high grade dysplasia are to be ideally subjected to endoscopic surveillance and possible resection of the dysplastic lesion (Kapadia, 2003).

In Nigeria Ajayi et al. (2015), found that biopsy and histology is mandatory for accurate diagnosis of gastritis in all cases .

CHAPTER THREE

METHODOLOGY

3.1 Study design

This was a descriptive prospective study that was carried out between January 2020 and March 2020

3.2 Study setting

The study was carried out at the Endoscopic unit of St Francis Hospital Nsambya.

St Francis Hospital Nsambya is a faith based not for profit hospital founded by the Little sisters of St Francis in 1903. It is a tertiary referral Hospital located on Nsambya Hill in Makindye division. It lies 5 kilometres from the central business district. It offers specialist services in Surgery, Internal Medicine, Obstetrics and Gynaecology and Paediatrics. It has a bed capacity of 361 beds.

The Surgery department occupies the ground floor of Regina Coeli building with both the male and Female surgical beds comprising 48 beds. The St Theresa Paediatric Ward and OLF General for the private patients are also part of the Department.

The Endoscopy unit of St Francis hospital Nsambya was established 23 years ago in 1996, by Italian Doctor LUIGI GIRARDIN, it commenced operation in 1997 under Dr. BUIN FRANCES, along with other Doctors in the department at the time, 2 upper GI scopes doing between 100-150 endoscopies per year in the first few years, but have expanded over the years currently with 4 upper GI scopes and 2 lower GI scopes with over 1700 patients being scoped annually. With a total of 1726 worked on in 2018. The unit is also currently actively performing minimally invasive endoluminal procedures for suitable candidates, it mainly handles Elective procedures and doesn't routinely handle Emergencies.

The unit is functional on weekdays on appointment basis from 7am-4pm and remains closed on public holidays and weekends.

Patients are received at the unit throughout the day clinically evaluated and then given appropriate future appointment for the procedure to be carried out. The unit is mainly run by Endoluminal Surgeons and Endoscopy nurses.

The Nsambya hospital Laboratory is a SANAS accredited lab, dealing with a wide range of procedures. The Histopathology section is run by senior Pathologist, with two Cyto-technologists, a histo-technician and data entry members under his supervision.

The histopathology laboratory analyses up to 2800 specimens on average per year. All tissue blocs are archived in a repository room

3.3 Study Population

All patients with dyspeptic symptoms referred to the Endoscopy unit of St Francis Hospital Nsambya.

3.4 Study period

The study was carried out between January 2020 and March 2020.

3.5 Selection criteria

3.5.1 Inclusion criteria

- All Patients with dyspeptic symptoms referred for endoscopy

3.5.2 Exclusion Criteria

- Patients with previously diagnosed GIT malignancy at histology.
- Patients with History of Gastric procedures including gastrectomy, Bypass procedures.

3.6 Sample size estimation

Yamane (1967) provides a simplified formula to calculate sample sizes for finite populations

$$\square = \frac{\square}{1 + \square\square}$$

Where

- N is the size of the population which in this case is the average number of endoscopies performed in St. Francis Hospital Nsambya in 3 months i.e. 150 endoscopies).
- n is the size of the sample
- e is the level of precision which is 5%

$$\square = \frac{150}{1 + 160 * 0.05} = 109$$

Assuming a 5% missing data our new sample size will be $\square = \frac{}{(\quad . \quad)} = 115$ dyspepsia participants

3.7 Patient recruitment

Patients were recruited at the Endoscopy unit.

3.8 Sampling procedure

This was consecutive sampling of Patients with dyspeptic symptoms that come to St Francis Hospital Nsambya Endoscopy unit.

3.9 Study variables

3.9.1 Independent variables

- Age
- Sex

3.9.2 Dependent variables

- Endoscopy findings
- Histopathological findings.

3.10 Study procedure

Patient recruitment was done at the Endoscopy unit of St Francis Hospital, Nsambya Hospital. All patients presenting with dyspeptic symptoms, on reporting to book for Endoscopy, were given information about the study and its usefulness to them, on consenting for participation, the endoscopy was done after an overnight fast of 8 hours using Karl Storz Gastroscope by the Endoscopist.

Gastric biopsies were taken from the following sites according to the Sydney and Houston system for grading gastritis: (1) Greater and lesser curvature of the distal antrum, (2) greater and lesser curvature of the proximal corpus, and (3) lesser curvature at the incisor angularis.

Samples were immediately labelled, taken to the Histopathology laboratory and prepared for reporting see -Appendix 2. Slides were examined by a senior pathologist examined and the histopathological findings stated.

3.11 Data collection

Data was collected using pre coded and pretested questionnaires. All patients were evaluated by the principal investigator for clinical evidence of dyspepsia. Investigations done and the results documented on questionnaires and filed to prevent data loss.

3.12 Data Management and Analysis

Data collected was entered into Microsoft Excel and analyzed with STATA version 14.0 (Copyright 1985-2011 Stata Corp LP, Texas, USA) with the assistance of a statistician. Continuous variables were summarized into means with standard deviations and categorical variables into proportions and percentages. Results were displayed in text, tables, pictures and bar charts. Relationships between variables were determined using chisquare p values from Kruskal Wallis test of equality of populations.

3.13 Quality control

- Research assistants were trained on collecting data
- Use of Senior Endoscopist
- Use of Senior Pathologist

3.14 Ethical considerations

1. All patients were informed about the study i.e. Purpose, benefits, type of procedure to be done, risks involved and informed consent was got.
2. Study was carried out with the approval of department of Surgery, Research and Ethics Committee Nsambya and Nsambya hospital administration.
3. Interviews were conducted in a private and comfortable place.
4. Confidentiality was ensured by use of numbers on questionnaires instead of participants names.
5. Participation in the study was on voluntary basis and refusal to participate in the study didn't affect the quality of treatment given.

3.15 Dissemination of Results

Results of this study were compiled into a dissertation book and disseminated to:

- The department of surgery
- The post graduate medical school library,
- The Research and Ethics committee

CHAPTER 4 RESULTS

4.1 Description of study participants

A total of 115 participants with dyspepsia were studied, among whom majority were male. Mean age of participants was 53.3 ±18.5 years. Mean age among females (53.2 ±18.5) was not different from that among males (53.4 ±18.7). 59(51.3%) participants were aged 53 years and below while 56(48.7%) were aged above 53 years. Table 1 describes the characteristics of study participants. Table 1. Characteristics of study participants

Characteristic (N=115)	Frequency	Percentage(%)
Age (mean, SD)	53.3 (±18.5)	-
Sex		
Female	53	46.1
Male	62	53.9

Objective 1: To describe endoscopic findings among patients with dyspepsia

Majority of the participants (90.4%) had inflammation of one or more sites while 11(9.6%) had malignancies. Among the 104 participants with inflammation, 39 had more than one site involved.

Figure 1 describes the endoscopic findings among patients with dyspepsia.

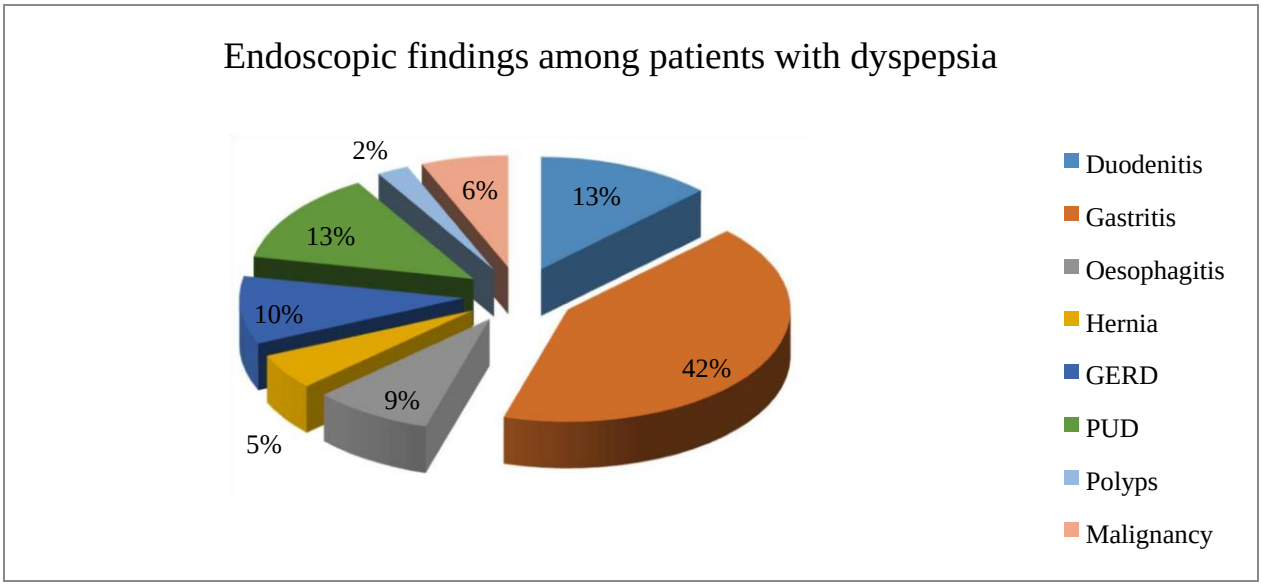


Figure 2. Frequency of endoscopy findings of 115 patients with dyspepsia

Table 2. Endoscopy findings of 115 patients with dyspepsia by age and sex

Characteristic (N=115)	Inflammation involving one organ (n=60)	Inflammation involving more than one organ (n=44)	Tumors (n=11)
Sex, n(%)			
Female (53)	28 (52.8)	22 (41.5)	3 (5.7)
Male (62)	32 (51.6)	22 (35.5)	8 (12.9)
Age, n(%)			
≤ 53 years (59) >53 years (56)	30 (50.8)	25 (42.4)	4 (6.8)
	30 (53.6)	19 (33.9)	7 (12.5)

Using the Kruskal Wallis test, endoscopy findings were not any different across age (p= 0.977) and sex (p= 0.638) while presenting complaints significantly influenced endoscopy findings of patients with dyspepsia (p= 0.002).

Objective 2: To describe the histopathological findings among patients with dyspepsia

12 participants had malignant and 2 had pre-malignant histopathology findings while the rest of the 101 participants had benign findings. Majority of the participants had inflammatory conditions with gastritis being the commonest finding in 72 (62.6%) of the participants, 19 of whom had follicular gastritis while 53 had superficial gastritis. Metaplasia was found in intestinal mucosa of 2(1.7%) participants while malignancies were found in 12 (10.4%) participants with the commonest malignancy being gastric adenocarcinoma in 7 (6.1%) of participants.

Table 3. Description of Histopathological findings of patients with dyspepsia

Organ	Acute	Chronic	Metaplasia	Malignancy
Stomach (n=124)			2	12
Superficial gastritis	41	12		
Follicular gastritis	7	12		
Gastric ulcer	2	7		
Peptic Ulcer Disease	1	25		
Polyp	3			
Duodenum (n=16)				
Duodenitis	2	2		
Duodenal ulcer	2	2		
Regional Enteritis	1			
Crohn’s disease	1			
H. pylori	6			

There was a significant difference between endoscopy and histopathology findings among three patients who were diagnosed with peptic ulcer disease at endoscopy but two had intestinal metaplasia, and the other gastrointestinal stromal tumor as their histology findings. The percentage concordance rate (malignancy at endoscopy/malignancy at histopathology × 100%) between endoscopy and histopathology therefore is 76.9%.

Table 4. Histopathological findings of patients with dyspepsia by age and sex

Characteristic (N=115)	Normal/ benign (n=102)	Malignancy (n=14)	p value
Sex, n(%)			0.242
Female (53)	48 (90.6)	5 (9.4)	
Male (62)	53 (85.5)	9 (14.5)	
Age, n(%)			0.117
≤ 53 years (59)	54 (91.5)	5 (8.5)	
>53 years (56)	47 (83.9)	9 (16.1)	

Histopathological findings across age and sex were not significantly different. However, presenting complaints and endoscopy findings had an influence on histopathological findings with p= 0.024 and p= <0.001 respectively.

CHAPTER 5

DISCUSSION

5.1 DEMOGRAPHICS

Dyspepsia was noted more among the male population than the female population in a ratio of 1.2:1 similar findings were noted in an Egyptian study by Emara et al. (2017), who reported an incidence of 55% in males and 45% in females. Gado et al. (2015), reported an incidence in 51% in males and 49% in females. Santosh B Desai et al reported a male to female ratio of 2.43:1 while Thomson et al. (2003), had a male to female ratio of was 1:1 likewise, Akram et al. (2019), reported a ratio of 1.55:1 (Akram et al., 2019). These similarities can probably be attributed to the fact that more male participants were recruited to participate.

Whereas similar findings were noted as above, Ali Jafar Heiderloo et al in Iran 2019 reported more females were recruited to the study compared to males in a ratio of 1:1.5 probably because of better health seeking behaviours of the women when compared to the males in this population.

In this study, the average age of participation was 53 years of which 59(51.3%) of the patients were below this age. This is similar to a Indian study by Amar and Naik (2019).

5.2 ENDOSCOPY FINDINGS

From this study, a high positive yield was noted at endoscopy in all the participants regardless of their complaint at the time of presentation for endoscopy. Similar analogy was reported Emara et al. (2017), this can probably be explained by the fact that both institutions are tertiary and as such receive high turnover of referred patients.

The commonest endoscopic finding was gastritis in 73 participants which is similar to findings from a study done in northern Tanzania by Ayana et al. (2014), study by Emara et al. (2017), and Manappallil and Alexander (2017), also reported gastritis as being the commonest finding at Endoscopy in a study done in South India. Peptic ulcer disease was noted as the second commonest

with 23 participants. Similarities in findings may be explained by the disease progression and chronicity

Inflammation involving more than one site was observed in 52.17% of the patients and was mostly observed in the male 51.61% participants than the females 46.67% these findings are similar to those noted by Ayana et al. (2014) probably due to proximity of organs involved and later presentation for medical treatment.

There was no normal finding reported at endoscopy which differs from the studies of Manapallil et al (Manappallil and Alexander, 2017) who reported normal endoscopic findings in 18% of their patients and Abahussain et al. (1998), who also reported normal findings in 32% of the patients at endoscopy. This difference is noted probably because this institution is a tertiary one and the nature of patients received are referrals from different parts of the region.

Upper GI malignancy was noted in 11 patients (9.57%) and occurred more in the male population (12.90%) than the females. All these patients presented for endoscopy with alarm symptoms, this is contrary to findings by Desai and Mahanta (2018), and Sumathi et al. (2008), this could be attributed to the differences in geographical location, and habitual practices and health seeking behaviors in our participants.

5.3 HISTOPATHOLOGY FINDINGS

The commonest finding at histopathology in our study was gastritis reported by 72 participants followed by peptic ulcer disease seen in 26 participants. These findings are similar to findings by Ndraha and Simadibrata (2012), and Emara et al. (2017), who reported chronic active gastritis in 96.3% of their study participants. These similar findings may be attributed to the fact that commonest cause of gastritis in our setting is bacterial which brings about accumulation of toxins and therefore inflammation of the gastric mucosa.

In our study, 75.65% of the patients had one condition diagnosed at histopathology while 24.35% had more than one condition. These findings similar to those noted by Thomson et al. (2003), and maybe explained by proximity of the organs involved and disease progression.

In most of the cases, the findings at endoscopy were in correspondence to those reported at histopathology. However, 2 of the 3 patients who were reported to have peptic ulcer disease at endoscopy were found to have intestinal metaplasia while the other had a gastrointestinal stromal tumor at histopathology with a concordance rate of 76.9%. These findings are comparable to the findings in a similar study done in Nigeria by Ajayi et al. (2015) to determine the correlation between endoscopic and histologic diagnosis of gastritis in which they found an 88.4% concordance between endoscopic and histopathologic findings. This further emphasizes the need for taking biopsy at endoscopy.

Malignancy was seen more among the males (14.5%) than the females (7.5%) and was observed more above the age of 53years (16.1%). Similar patterns were reported by (Dinesh et al. (2015)), this can probably be explained by the fact that more male participants and late presentation for medical care.

The endoscopy findings each had a significant influence on the histopathology $p=0.024$ and $p=<0.001$ respectively.

5.4 LIMITATIONS

- Being a tertiary institution, the kind of patients that were received for endoscopy were mostly referrals.
- Short study period over which the study was carried out.

5.5 CONCLUSION

From this study:

- All the patients who presented with dyspepsia had either esophagitis, GERD, Hiatus hernia, gastritis, peptic ulcer disease, duodenitis, polyps or tumors at Endoscopy. No normal findings were seen at endoscopy. Likewise at histopathology, no normal findings were noted with the commonest finding being Gastritis.

- In 3 of the participants, findings described at endoscopy were not similar to the findings described at histopathology, where as at endoscopy, the findings were Peptic Ulcer disease, at histopathology, 2 were reported to have intestinal metaplasia and 1 had gastrointestinal stromal tumor.

5.6 RECOMMENDATIONS

1. In patients with dyspepsia of >53years who present for upper GI endoscopy it would be advisable to take off an initial biopsy.

2. From our study findings, and with the recent advancements such as chromoendoscopy, this study would serve as a benchmark for guiding hospital policy and improving on our services.

REFERENCES

AASMA SHAUKAT, M., MPH, FASGE, AMY WANG, MD, RUBEN D. ACOSTA, MD, DAVID H. BRUINING, MD,, VINAY CHANDRASEKHARA, M., KRISHNAVEL V. CHATHADI, MD, MOHAMAD A. ELOUBEIDI, MD, MHS, FASGE,, ROBERT D. FANELLI, M., FACS, FASGE, SAGES REPRESENTATIVE, ASHLEY L. FAULX, MD, FASGE,, LISA FONKALSRUD, B., RN, CGRN, SURYAKANTH R. GURUDU, MD, FASGE,, LORALEE R. KELSEY, B., RN, CGRN, SGNA REPRESENTATIVE, MOUEN A. KHASHAB, MD, SHIVANGI KOTHARI, MD,, JENIFER R. LIGHTDALE, M., MPH, FASGE, NASPGHAN REPRESENTATIVE, V. RAMAN MUTHUSAMY, MD, FASGE,, SHABANA F. PASHA, M., JOHN R. SALTZMAN, MD, JULIE YANG, MD, & BROOKS D. CASH, M., PREVIOUS COMMITTEE CHAIR, JOHN M. DEWITT, MD, FASGE, CHAIR 2015. The role of endoscopy in dyspepsia. Gastrointestinal endoscopy, 82.

ABAHUSSAIN, E. A., HASAN, F. A. & NICHOLLS, P. J. 1998. Dyspepsia and Helicobacter pylori infection:

Analysis of 200 Kuwaiti patients referred for endoscopy. Annals of Saudi Medicine, 18, 502-505.
AGREUS, L. 2002. Natural history of dyspepsia. Gut, 50, iv2-iv9.
AJAYI, A. O., AJAYI, E. A., SOLOMON, O. A., DUDUYEMI, B., OMONISI, E. A. & TAIWO, O. J. 2015. Corelation between the endoscopic and histologic diagnosis of gastritis at the Ekiti State university teaching hospital, Ado Ekiti, Nigeria. International Journal of Internal Medicine, 4, 9-13.
AKRAM, B., MOHAMMED, S. S., MOHAMMED, A. A. & OBAID, K. A. 2019. Significance of Endoscopyic Findings in Patients with Dyspepsia in Diyala Province-Iraq Hospital Based Study. Diyala Journal of Medicine, 17, 107-114.
AMAR, D. & NAIK, A. 2019. Analysis of upper GI endoscopy findings in patients of dyspepsia at a tertiary care centre in Karnataka: A retrospective study. International Journal of Surgery, 3, 91-94.
AYANA, S. M., SWAI, B., MARO, V. & KIBIKI, G. S. 2014. Upper gastrointestinal endoscopic findings and prevalence of Helicobacter pylori infection among adult patients with dyspepsia in northern Tanzania. Tanzania journal of health research, 16.
DAWOD, H. M. & EMARA, M. W. 2016. Histopathological assessment of dyspepsia in the absence of endoscopic mucosal lesions. Euroasian journal of hepato-gastroenterology, 6, 97.
DESAI, S. B. & MAHANTA, B. N. 2018. A study of clinico-endoscopic profile of patient presenting with dyspepsia. Clinical Epidemiology and Global Health, 6, 34-38.
DINESH, H., KUMAR, C. J., SANJAY, H. & SACHIN, V. 2015. Is Endoscopy Really Necessary in My Case? A Four Year Retrospective Study. Journal of clinical and diagnostic research: JCDR, 9, PC12.
EMARA, M. H., SALAMA, R. I. & SALEM, A. A. 2017. Demographic, endoscopic and histopathologic features among stool H. pylori positive and stool H. pylori negative patients with dyspepsia. Gastroenterology research, 10, 305.
GADO, A., EBEID, B., ABDELMOHSEN, A. & AXON, A. 2015. Endoscopic evaluation of patients with dyspepsia in a secondary referral hospital in Egypt. Alexandria Journal of Medicine, 51, 179–184-179–184.
HEIDARLOO, A. J., MAJIDI, H., MEHRYAR, H. R., AZAR, M. R. H. & HASANI, L. 2019. Evaluation of the endoscopic findings in patients with dyspepsia. Journal of Research in Clinical Medicine, 7, 12-17.
KAGEVI, I., LÖFSTEDT, S. & PERSSON, L.-G. 1989. Endoscopic findings and diagnoses in unselected dyspeptic patients at a primary health care center. Scandinavian Journal of Gastroenterology, 24, 145-150.
KAPADIA, C. R. 2003. Gastric atrophy, metaplasia, and dysplasia: a clinical perspective. Journal of clinical gastroenterology, 36, S29-S36.
LEE, Y. J., ADUSUMILLI, G., KYAKULAGA, F., MUWEREZA, P., KAZUNGU, R., BLACKWELL JR, T. S., SAENZ, J. & SCHUBERT, M. C. 2019. Survey on the prevalence of dyspepsia and practices of dyspepsia management in rural Eastern Uganda. Heliyon, 5, e01644.
LONGSTRETH, G. F., LACY, B. E., TALLEY, N. & GROVER, S. 2013. Approach to the adult with dyspepsia. UpToDate.
MADISCH, A., ANDRESEN, V., ENCK, P., LABENZ, J., FRIELING, T. & SCHEMANN, M. 2018. The diagnosis and treatment of functional dyspepsia. Deutsches Ärzteblatt International, 115, 222.
MAHADEVA, S. & GOH, K.-L. 2006. Epidemiology of functional dyspepsia: a global perspective. World journal of gastroenterology: WJG, 12, 2661.
MANAPPALLIL, R. G. & ALEXANDER, T. 2017. Clinical and endoscopic evaluation of dyspeptic patients attending a tertiary care hospital in South India: A prospective study. Asian Journal of Medical Sciences, 8, 58-63.

MEHMOOD, K., SAEEDI, M. I. & MUHAMMAD, R. 2011. Upper gastrointestinal endoscopic findings in patients with dyspepsia. Journal of Postgraduate Medical Institute (Peshawar-Pakistan), 20.

MIN, B.-H., HUH, K. C., JUNG, H.-K., YOON, Y. H., CHOI, K. D., SONG, K. H., KEUM, B. & KIM, J. W. 2014. Prevalence of uninvestigated dyspepsia and gastroesophageal reflux disease in Korea: a population-based study using the Rome III criteria. Digestive diseases and sciences, 59, 2721-2729.

MOAYYEDI, P. M., LACY, B. E., ANDREWS, C. N., ENNS, R. A., HOWDEN, C. W. & VAKIL, N. 2017. ACG and CAG clinical guideline: management of dyspepsia. American Journal of Gastroenterology, 112, 988-1013.

NAYAK, S. R., GANNI BHASKARA RAO, D. K. S. & APPAKA, J. K. 2016. Endoscopic evaluation of patients with dyspepsia in a tertiary care hospital: a prospective study. Dysphagia, 23, 26.74.

NDRAHA, S. & SIMADIBRATA, M. 2012. Upper gastrointestinal endoscopic and histopathological findings in patients with dyspepsia. Indonesian Journal of Gastroenterology, Hepatology, and Digestive Endoscopy, 13, 23-28.

OLING, M., ODONGO, J., KITUUKA, O. & GALUKANDE, M. 2015. Prevalence of Helicobacter pylori in dyspeptic patients at a tertiary hospital in a low resource setting. BMC Research Notes, 8, 256.

REDÉEN, S., PETERSSON, F., JÖNSSON, K.-Å. & BORCH, K. 2003. Relationship of gastroscopic features to histological findings in gastritis and Helicobacter pylori infection in a general population sample. Endoscopy, 35, 946-950.

SHMUELY, H., OBURE, S., PASSARO, D. J., ABUKSIS, G., YAHAV, J., FRASER, G., PITLIK, S. & NIV, Y. 2003. Dyspepsia symptoms and Helicobacter pylori infection, Nakuru, Kenya. Emerging infectious diseases, 9, 1103.

SIPPONEN, P. & STOLTE, M. 1997. Clinical impact of routine biopsies of the gastric antrum and body. Endoscopy, 29, 671-678.

SIVAK, M. 2006. Gastrointestinal endoscopy: past and future. Gut, 55, 1061-1064.

STANGHELLINI, V. 2017. Functional dyspepsia and irritable bowel syndrome: beyond Rome IV. Digestive Diseases, 35, 14-17.

STOLTE, M. & MEINING, A. 2001. The updated Sydney system: classification and grading of gastritis as the basis of diagnosis and treatment. Canadian journal of gastroenterology, 15.

SUMATHI, B., NAVANEETHAN, U. & JAYANTHI, V. 2008. Appropriateness of indications for diagnostic upper gastrointestinal endoscopy in India. Singapore medical journal, 49, 970.

THOMSON, A., BARKUN, A., ARMSTRONG, D., CHIBA, N., WHITE, R., DANIELS, S., ESCOBEDO, S., CHAKRABORTY, B., SINCLAIR, P. & VELDHUYZEN VAN ZANTEN, S. 2003. The prevalence of clinically significant endoscopic findings in primary care patients with uninvestigated dyspepsia: the Canadian Adult Dyspepsia Empiric Treatment–Prompt Endoscopy (CADET–PE) study. Alimentary pharmacology & therapeutics, 17, 1481-1491.

VAIRA, D., HOLTON, J., OSBORN, J., D'ANNA, L., ROMANOS, A., FALZON, M. & MCNEIL, I. 1990. Endoscopy in dyspeptic patients: is gastric mucosal biopsy useful? American Journal of Gastroenterology, 85.

WALKER, M. 2003. Is intestinal metaplasia of the stomach reversible? Gut, 52, 1-4.

WANKHADE, R., RANBAGLE, P., PATHAN, S., GUJAR, S. & MELKUNDE, S. 2018. Clinico-endoscopic Correlation of Dyspepsia at Tertiary Care Centre. Indian Journal of Basic and Applied Medical Research; Surgical Speciality Issue: September, 7, 11-19.

WILLIAMS, B., ELLINGHAM, J., LUCKAS, M., DAIN, A. & WICKS, A. 1988. Do young patients with dyspepsia need investigation? The Lancet, 332, 1349-1351.

APPENDIX 1

ENDOSCOPY AND HISTOPATHOLOGY FINDINGS AMONG PATIENTS WITH DYSPEPSIA AT NSAMBYA HOSPITAL

STUDY QUESTIONNAIRE

ADMINISTRATIVE INFORMATION

Patient number……

Date of collection……

DEMOGRAPHIC INFORMATION

Age (Years): …… Sex: ☐ Male0 Female1 ☐

Clinical information

Dyspeptic symptoms (Tick all that apply)

Epigastric pain

Epigastric burning

Vomiting feeds

Hematemesis

3. Endoscopic findings

-Normal findings

-Abnormal findings:

- Gastritis- mild moderate severe atrophic
- Gastric ulcer
- Duodenal ulcer
- Tumor

4.Histopatological findings

- Normal
- Atrophic gastritis
- Non atrophic gastritis

- Metaplasia

APPENDIX 2: HEMATOXYLIN EOSIN STAINING PROCEDURE

1.0 Introduction

H&E stain is a popular staining method in histology. It is the most widely used stain in medical diagnosis; for example when a pathologist looks at a biopsy of a suspected cancer, the histological section is likely to be stained with H&E and termed H&E section.

Hematoxylin is extracted from the heartwood (logwood) of the tree hematoxylin campechiam. The compound is known to destroy hematein contained in the tissue, turning it into a colorless substance. Hematein is anionic, having poor affinity for tissue and is inadequate as nuclear stain without the presence of a modant e.g alum, iron, tungsten, lead etc. Alum hematoxylin combines readily with eosin therefore this is to stain paraffin wax sections.

2.0 Purpose

The purpose of this document is to define the use of Hematoxylin and Eosin staining method, procedure and quality control.

3.0 Scope

The staining procedure applies to the histopathology laboratory with the aim investigating pathological diseases and studies

4.0 Responsibility

All trained technical laboratory staff and pathologists performing H&E staining shall ensure compliance to this document. The laboratory manager and/or designee should ensure compliance and implementation of this procedure, and are responsible for the annual revision of this procedure.

5.0 Principle

Hematoxylin is a basic dye with affinity for tissue; therefore it stains the nucleus part of the cells whereas Eosin is an acidic dye which is used to stain the cytoplasm of a cell. Water is then used to remove the excess stain from the tissue. Series of alcohols are used to fix the stain in the cells whereas xylem is used to dissolve wax and other fatty materials from the section.

6.0 Equipment and materials

a) Staining jars

b) Staining rack

c) Microscope slides

d) Cover slips 24×50

e) Forceps

f) Mount ant

g) Pasteur pipette

h) Mayer’s hematoxylin

i) Harris hematoxylin

j) Masks

k) Gloves

7.0 Procedure

a) Dewax sections, hydrate through graded alcohols to water.

b) Stain in Hematoxylin if;

- Harris for 6 minutes
- Mayer for 4 minutes

c) Bluing sections under running water for 5 – 10 minutes.

d) Stain in 1% Eosin for 10 – 30 seconds depending on the quality of Eosin stain after quality controlling it.

e) Wash in tap water if Eosin contains acetic acid otherwise do not.

f) Dehydrate in alcohols and clear through xylens/bioclear.

g) Mount the slides with DPX mounting oil.

8.0 Quality control

a) Varies with the nature of tissue

b) Check for quality of staining considering absence of artefacts

c) Comparison of pathologist results with other pathologists results

d) The in situ oxidation of Hematoxylin is effected by the addition of a strong oxidant to the stain, in this case sodium iodate.

9.0 Results

The staining results are as illustrated below:

Nuclei ……. blue/black

Cytoplasm …….. varying shades of pink

Muscle fibres ……. Deep pink/red

Red blood cells …….. orange/red

Fibrin ……. Deep pink

9.1 Interpretation of results

For the pathologist

10.0 Limitations

Over used reagents may affect the quality of stain.

APPENDIX 3 :INFORMED CONSENT

CONSENT STATEMENT

Hello, my name is…… I am a principal investigator in the study "Endoscopy and Histopsthology findings among patients with Dyspepsia at St. Francis Hospital Nsambya."

The study aims to identify the findings at endoscopy and also the specific histopathology changes that occur to the gastric mucosa.

The results of this study will help the patient, the hospital, the university and the ministry of health in planning strategies to improve on the daily running of endoscopy units effect new protocols and provide better management for dyspeptic patients.

To obtain this information, I will interview all consecutive dyspeptic patients arriving to the endoscopy unit for the procedure. This interview will take about thirty minutes before the patient books for the procedure. There will be benefit to the patient upon participation in the study. And no physical or mental harm will be imposed on the patient during the study.

The information provided shall be kept strictly confidential and the identity of the patient will not be disclosed. The results of the study will not be reported as individual but as overall patterns for all the study participants and will be used only for the purpose of this study. Your participation is entirely voluntary and you are free to either accept or refute to participate in the study. You are also free to ask any questions concerning the study.

You will be a liberty to terminate your participation in the study without any consequences in the continued treatment

Consent

I, the undersigned ....., having been informed about he study/ having read all the above, had time to ask questions, received all the answers concerning issues I didn't understand, to willfully give consent for participation in the study

Patient or next of kin signature/thumbprint Date

Person informing/discussing

Date

APPENDIX 4: BUDGET

ITEM	QUANTITY	UNIT COST	TOTAL COST
Flash Disc	1	20000	20000
Recurrent/stationary expenses			
Photocopying and Printing	2		1000000

Statistician	1	Data entry Data analysis	2000000
Miscellaneous			500000
Total			3520000