

SAINT PAUL'S HOSPITAL MILLENNIUM MEDICAL COLLEGE



Magnitude and associated factors of Peptic Ulcer Disease among patients with chronic liver disease at St. Paul's Hospital Millennium Medical Collage: A 21-month retrospective study

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List of Acronyms/Abbreviations

SPHMMC= Saint Paul's Hospital Millennium Medical College

Abd U/S = Abdominal ultrasound

CBC = Complete blood count

CLD = Chronic Liver diseases

EGD= Esophagogastroduodenoscopy

DU= Duodenal ulcer

EV = Esophageal varices

FMOH= Federal Ministry of Health

GI clinic= Gastrointestinal clinic

G.C = Gregorian calendar

GU= Gastric ulcer

HBV= Hepatitis B virus

HCV = Hepatitis C virus

H. pylori= Helicobacter pylori

NAFLD= Nonalcoholic fatty liver disease

NSAIDs= Non-steroidal anti-inflammatory drugs

PHTN = Portal hypertension

PHG = Portal hypertensive gastropathy

PUB = Peptic ulcer bleeding

PI= Principal Investigator

SPSS = Statistical Package for the Social Sciences

Abstract

Background

Chronic liver disease and its complications are major health problems worldwide. Peptic ulcer disease is one of the most frequently observed complications in patients with liver cirrhosis. Factors related to peptic ulcer development and the causes of increased prevalence of the disease in cirrhotic patients are poorly understood.

Objective

To assess the magnitude and associated factors of peptic ulcer disease among patients with chronic liver disease at St. Paul's Hospital Millennium Medical College gastrointestinal clinic.

Methodology

Using a retrospective analytic study design, a cross sectional study was conducted at St Paul's Hospital Millennium Medical College GI and endoscopy unit. 148 consecutive cirrhotic patients who had upper GI endoscopy and follow up across a 21-month period from September 1, 2017 to June 1, 2019 were included. Their charts were reviewed for socio-demographic and clinical information using a structured questionnaire. Data was analyzed using SPSS version 25 and a p-value <0.05 was considered significant. Tables and figures were used to describe the results.

Results

All hundred forty-eight patients (M/F: 106/42, mean age: 38 years) were included in the analysis. Hepatitis B virus (46.6%) and alcohol (18.9%) were the most common causes of cirrhosis. The prevalence of peptic ulcer disease in patients with cirrhosis was 19.6% with duodenal ulcer prevalence of 8.1%. *H. Pylori* infection ($P=0.037$), and Child-Pugh class C ($P= 0.001$) and ascites ($P= 0.023$) were associated with peptic ulcer in cirrhotic patients. By multivariate analysis, *H. pylori* infection (OR: 3.65; 95% CI: 1.12– 11.88; $P = 0.032$) was independently associated with peptic ulcer.

Conclusion and recommendation

The study showed that peptic ulcer was present in 19.6% patients of liver cirrhosis. In patients with CLD, who present with upper GI bleeding, ulcer should be considered as an important cause and should be treated. Patients should also be considered for treatment of *H. Pylori* after stabilization.

1. Introduction

1.1 Background

Chronic liver disease and its complications are major health problems worldwide. It develops when duration of illness is more than 6 months. It generally progresses slowly from hepatitis to cirrhosis, often over 20 to 40 years.

Cirrhotic patients are at a higher risk of developing peptic ulcer disease (PUD), and those with bleeding peptic ulcers have a fivefold higher risk of complications or death compared with the general population(1,2).

Peptic ulcer has been reported as occurring with increased frequency in patients with chronic liver disease. There is also evidence to suggest greater ulcer recurrence rate compared with the general population. Patients with liver cirrhosis are frequently subjected to a number of disorders of the gastric mucosa. Peptic lesions in the gastroduodenal mucosa have been found to be more frequent in cirrhotic than in control. The pathogenesis of gastric ulcer in cirrhotic patients may be explained by the effect of portal hypertension that causes splanchnic congestion and alters normal reparative processes of gastroduodenal mucosa. The impact of other factors, e.g. age, sex, Child-Pugh classification and portal hypertensive gastropathy (PHG), on the pathogenesis of peptic ulcer in cirrhosis has never been explored (3,4).

Factors related to peptic ulcer development and the causes of increased prevalence of the disease in cirrhotic patients are poorly understood. In the general population, *Helicobacter pylori* infection is central to the pathogenesis of peptic ulcer disease. However, the role of *H. pylori* infection in the pathogenesis of peptic ulcer disease in cirrhotic patients still remains to be elucidated (5). Many studies have suggested a role for *H. pylori* infection in the pathogenesis of peptic ulcer disease in cirrhotic patients, but several studies have found no relationship (6-11).

1.2 Statement of the problem

Chronic liver disease and its complications are major cause of morbidity and mortality globally. Compared with the general population, patients with cirrhosis have higher bleeding complications, delayed healing, and greater ulcer recurrence rates (12,13).

Acute upper gastrointestinal bleeding frequently occurs in patients who have liver cirrhosis, with acute variceal hemorrhage and peptic ulcer bleeding (PUB) accounting for 60%-70% and 20%-30% of all episodes, respectively. PUB has been associated with substantial morbidity and mortality in patients who have cirrhosis (14-17).

It has been shown, Venkatesh PG, Parasa S et al, that both decompensated and compensated cirrhosis are associated with increased mortality in patients with peptic ulcer bleeding (18).

In general, peptic ulcer is caused by *Helicobacter pylori* infection, (19,20) non-steroidal anti-inflammatory drug (NSAID) use(21) and smoking (22). The prevalence of *H. pylori* infection in peptic ulcer patients varies from region to region.

There are no traceable studies done to see burden of peptic ulcer disease and its risk factors in CLD patients in Ethiopia.

1.3 Significance of this study

The purpose of this study is to assess the prevalence of peptic ulcer disease and associated factors in patients with liver cirrhosis in our setting and to compare it with global sited disease burden in developing countries. It will try to answer what are common risk factors for peptic ulcer among CLD patients.

It tries to give the chance to prioritize which patient are at high risk for peptic ulcer and undergo intervention. It will contribute to understand the magnitude of the problem and identify important risk factors that could be modified through crucial treatment strategies. Furthermore this study can be used as the reference for further studies in the field and helps as the source data.

2. Literature review

Liver cirrhosis is a major health problem world-wide and peptic ulcer is a condition that is commonly seen in patients with liver cirrhosis. *Helicobacter pylori* infection remains one of the most common chronic bacterial infections in humans. Peptic ulcer is commonly seen in asymptomatic cirrhotic patients who undergo endoscopic screening for varices. *Helicobacter pylori* infection and advanced stages of cirrhosis are two important factors associated with peptic ulcer. The prevalence of peptic ulcer disease in cirrhosis was 11.7%, period prevalence was 15.1% and life time prevalence was 24.2%, nearly 70% of the ulcers were asymptomatic which puts the patient at higher risk for bleeding since absence of symptoms may delay visits to the health care facility (1,2).

A number of studies looked in to the role of *H. pylori* infection in the pathogenesis of peptic ulcer disease in the setting of liver cirrhosis. In a study done in South Korea, the prevalence of peptic ulcer disease in patients with cirrhosis was 24.3%. The prevalence of peptic ulcer disease in patients with cirrhosis divided into Child-Pugh classes A, B, and C was 22.3%, 21.0%, and 31.3%, respectively (3-5).

Calvet et al observed that male sex and *H pylori* seropositivity are significantly related to peptic ulcer disease in cirrhotic patients (10).

Peptic ulcer related complications are a major cause of morbidity and mortality in cirrhotic patients. Peptic ulcer bleeding accounts for 30% of gastro-intestinal (GI) bleeding in patients with cirrhosis (24).

In a study conducted by B. R Devrajani et al, there was a strong association of *Helicobacter pylori* with peptic ulcer disease in cirrhotic (25).

Another study by Kirchner GI et al showed lack of firm association between *H. pylori* prevalence and ulcer frequency in liver cirrhosis. In the same study it was found that asymptomatic ulcers are more common in cirrhotic with advanced disease (26).

In an Italian study, done in patients HCV related liver cirrhosis, an active peptic ulcer was found in 14 patients (8%) and was significantly more common among those with *H pylori* infection (16% versus 2% in *H pylori* uninfected patients (27).

In a prospective study that was undertaken to determine the frequency of peptic ulceration in different forms of chronic liver disease; peptic ulceration was found in 14.7% of patients with CLD and it occurred most frequently in hepatitis B virus- associated chronic liver disease (33%), but also commonly in alcoholic liver disease (22%), and primary biliary cirrhosis (14%) (28).

There are few studies done to see the prevalence of peptic ulcer and risk factors in CLD patients in Africa. A study done in Egypt to assess the prevalence and outcome of PUB in patients with liver Cirrhosis; 60% of non-variceal upper gastrointestinal bleeding was caused by PUB in cirrhotic patients (29). In Nigerian study to describe different types of lesions that can be found in patients with liver cirrhosis during upper GI endoscopy shows duodenal ulcers in 7.1% of patients (30).

There are no traceable studies done to see burden of peptic ulcer disease and its risk factors in CLD patients in Ethiopia. Portal Hypertension and its complications, mainly Varices and portal Hypertensive Gastropathy, are known causes of Upper GI bleeding in cirrhosis and treatment for ulcer as a cause of bleeding is usually overlooked and patients lack proper treatment unlike non-cirrhotic patients, for whom early empirical treatment is started. Hence, this study will try to analyze the magnitude of ulcer as a cause of bleeding in cirrhotic patients sent to an upper GI Endoscopy in one of the biggest endoscopy centre in Ethiopia.

3. Objective of study

3.1 General objective

To assess the magnitude and associated factors of peptic ulcer disease among CLD patients at SPHMMC GI referral clinic

3.2 Specific objective

To assess the magnitude of duodenal ulcer among CLD patients at SPHMMC GI clinic

To assess the magnitude of gastric ulcer among CLD patients at SPHMMC GI clinic

To assess associated factors of peptic ulcer disease among CLD patients at SPHMMC GI clinic

4. Methodology

4.1 Study area

The study was conducted at St Paul's Hospital Millennium Medical College (SPHMMC). The hospital is one of the tertiary referral hospitals in the capital city, Addis Ababa. St Paul Hospital was built by Emperor Haile Selassie in 1961. It is a public hospital primarily serving those unable to afford care elsewhere, providing service free of charge to 75 % of its patients. An estimated 2800 academic, clinical, administrative and supportive staff provide care for patients coming from all over the country. St Paul receives referral from all over the country and is under guidance of the Ethiopian Ministry of Health. In 2007, St Paul added a medical college; St Paul hospital millennium medical college.

The department of internal medicine has 7 subspecialty clinics. GI and endoscopy unit is one of them. Endoscopic procedure was started in 2006 (1999 E.C.). Around 300 procedures (both upper endoscopy and colonoscopy) are being done per month for different indications. The gastroenterology/hepatology unit is the first to establish a fellowship program in the department. It has 5 permanent gastroenterologists, 2 part-time staffs and one Endoscopist and supporting Endoscopy Nurses. It also runs well recognized multi-centre international research activities including the largest cohort of Hepatitis B study in Sub-Saharan Africa. It has collaboration mainly with University of Michigan and Oslo University Hospital. It is a World Endoscopy Organization (WEO)/ European Association of Gastrointestinal Endoscopy (ESGE) accredited training site in Africa.

4.2 Study design

The study design was a retrospective analytic study design.

4.3 Source Population

Patients with CLD having follow up at SPHMMC GI referral clinic.

4.4 Study population

CLD patients who had upper GI endoscopy.

4.4.1 Inclusion and Exclusion criteria

Inclusion criteria

1. Age ≥ 18 years
2. A diagnoses of CLD
3. Patients who have upper GI endoscopy performed

Exclusion Criteria

1. Patients with incomplete records
2. Those with non-cirrhotic causes of portal hypertension

4.5 Sample size and sampling technique

4.5.1 Sample size determination

Sample size is calculated by using the single population proportion formula

$$n = Z^2 p(1-p) / d^2$$

n= required sample size

Z= confidence level at 95% (standard value of 1.96)

d= margin of error = 5%

P= estimated peptic ulcer prevalence among CLD patients: not known in Ethiopia and 50% is taken as proportion of population to give maximum sample size.

$$n = (1.96)^2 * 0.5 * 0.5 / (0.05)^2$$

$$n = 384$$

Since the source population is $< 10,000$, there is a need to use population correction formula which is $n = n_i * N / N + n_i$ where n_i = initial sample size = 384

$$N = \text{source population} = 240$$

$$= 384 * 240 / 384 + 240 = 148$$

4.5.2 Sampling Technique

Using non-probability convenience sampling method, CLD patients having EGD and follow up at GI clinic from September 1, 2017 to June 1, 2019 were included.

4.6 Data collocation tools and procedures

The data collection format was prepared to capture information from different registries. The data collection format includes back ground information, liver disease information, and laboratory, upper GI endoscopy and peptic ulcer disease risk factors.

4.7 Study variables

4.7.1 Dependent variables

- Peptic ulcer disease

4.7.2 Independent variables

- Age
- Sex
- CLD
- H. pylori
- Etiology/causes of CLD
- Stage (Child- Pugh class) of CLD
- Smoking
- Alcohol use
- NSAIDs use

4.8 Operational definitions

- **Chronic liver disease (CLD)/Crrhosis:** A patient diagnosed either by history, clinical signs of CLD, abdominal U/S, liver function parameters and upper GI endoscopy.
- **Decompensated cirrhosis:** cirrhosis with complications such as intractable ascites, esophageal or gastric variceal hemorrhage or hepatic encephalopathy .
- **Small ascites** – controlled with supportive care
- **Moderate ascites** – controlled with diuretics
- **Large/Severe**-unable to control with diurtetics
- **Portal hypertension:** Portal vein diameter >12mm or other signs like varices, PHG or ascites in the setting of cirrhosis
- **Significant alcohol consumption-** history of alcohol taking => 3drinks/week

4.9 Data processing and analysis

Data was analyzed with Statistical Package for Social Sciences (SPSS) version 25. Frequency and cross tabulation were used to summarize descriptive statistics of the data. In descriptive statistical analysis mean, range, percentage, frequency distribution and appropriate graphic presentation were used. Bivariate and multivariate analyses between dependent and independent variables were performed using chi square (χ^2) and binary logistic regression. Data was also presented using tables and graphs. Statistically significant association was considered at P-value < 0.05, and its strength was presented using odds ratio (OR) and 95% confidence interval (CI).

4.10 Data quality control

To ensure the quality of data, preceding data collection, training of the data collectors was carried out for one day by the principal investigator on the objective, relevance of the study and confidentiality of information. Pre tested questionnaire was checked for its clarity and the collected data were reviewed and checked for completeness and consistency by principal investigator.

4.11 Ethical consideration

Ethical clearance and permission letter was obtained from the Institutional Review Board (IRB) of Saint Paul's Millennium Medical College. A formal letter was written by the Medical Service Vice Provost Office of the Hospital and Department of Internal medicine to the concerned units. The names of the patients were not mentioned and the information gained from the chart were used only for research purpose.

4.12 Dissemination of results

The result of this study will be presented as one of the partial fulfillments of residency programme in internal medicine department. It will be submitted to Saint Paul's hospital millennium medical college department of internal medicine, post graduate coordinator office and shared to public health department. After accommodating the comments, the findings will be published in locally accessible or international journals.

5. Results

5.1 Socio demographic and clinical characteristics

A total of hundred forty eight cirrhotic patients who had EGD and attended the gastrointestinal clinic during a 21 month period from September 1, 2017 – June 1, 2019 G.C were enrolled in the study; of them 106 (71.6%) were male with age ranging from 18-78 years, and mean age of 38 years.

In this study hepatitis B virus (46.6%) was the most common cause of cirrhosis followed by alcohol (18.9%). There were 53, 75 and 20 patients in Child-Pugh classes A, B and C groups, respectively. Six patients (4.1%) were regular smokers. Significant alcoholic consumption was found in 31 patients (20.9%). The history of NSAID, Prednisolone and PPI use was identified in 5 patients (3.38%), 1 patient (0.67%) and 21 patients (14.18%), respectively. Demographic and clinical data of the patients are shown in Table 1 and Table 2.

Table 1: Socio demographic characteristics of study participants (n=148)

Variable	Category	Frequency (n)	Percent (%)
Age	18-30	59	39.9
	31-40	42	28.4
	41-50	26	17.6
	51-60	11	7.4
	>60	10	6.8
Sex	Male	106	71.6
	Female	42	28.4
Residence	Urban	61	41.2
	Rural	87	58.8

Table 2: Clinical characteristics of study patients

Variables	Number (%)
Total number	148
Etiology of CLD	
HBV	69 (46.6%)
Alcohol	28 (18.9%)
HCV	18 (12.2%)
Autoimmune	5 (3.4%)
NAFLD	1 (0.7%)
Unknown	27 (18.2%)
Child-Pugh classification	
A	53 (35.8%)
B	75 (50.7%)
C	20 (13.5%)
Ascites	
Yes	100 (67.6%)
No	48 (32.4%)
Albumin * (g/dl)	3.14 ± 0.74
Platelet count * (x 10 ³ /mic.L)	116.5 ± 80.1
Total bilirubin* (mg/dl)	1.68 ± 1.97

Values are expressed as *mean ± s.d.,

5.2 Prevalence of peptic ulcer disease

Peptic ulcer was detected in 29 cirrhotic patients (19.6%): 12 patients (8.1%) had duodenal ulcer, 9 patients (6.1%) had gastric ulcer and 8 patients (5.4%) had both gastric and duodenal ulcers. Twenty of these patients were male. The frequency duodenal ulcer compared to gastric ulcers was 1.3: 1. The male-female ratio in the duodenal ulcer group was 1.2: 1 while in the gastric ulcer group it was 0.49: 1.

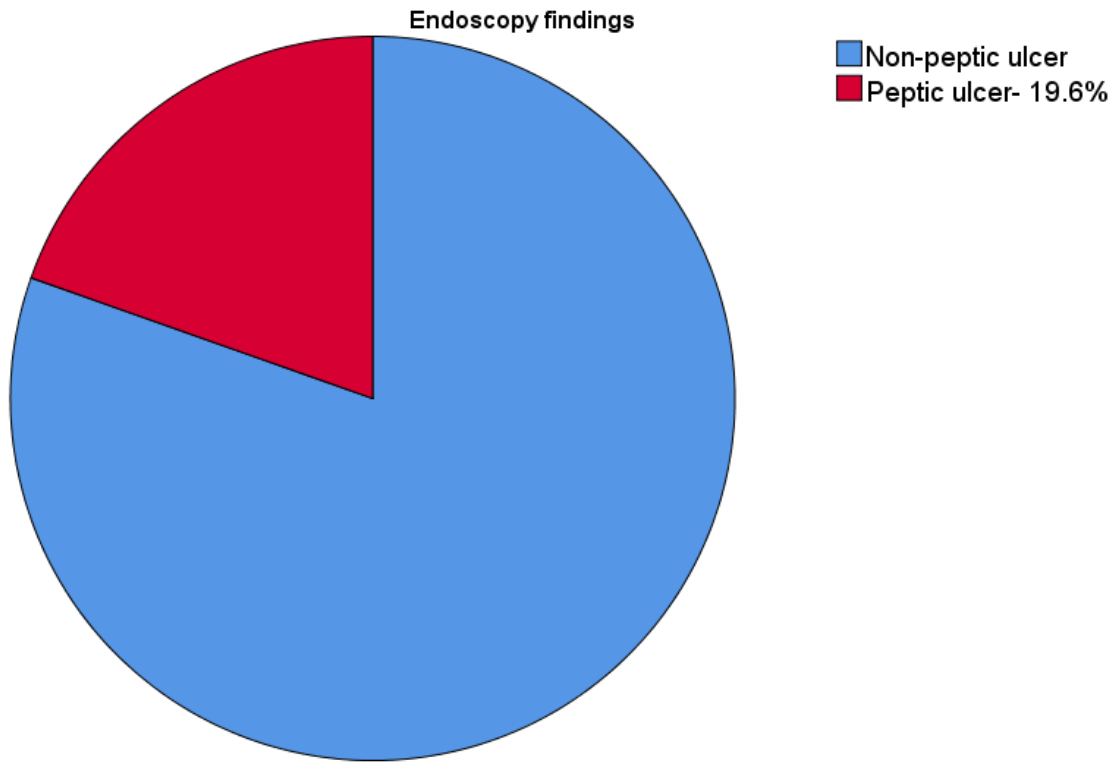


Figure 1: Proportion of patients with peptic ulcer disease (**N= 148**)

Table 3: Proportion of patients with peptic ulcer with respect to sex, etiology of cirrhosis and H.Pylori infection

Variable (N=148)	Peptic ulcer, n (%)	DU, n(%)	GU, n(%)	DU + GU, n (%)	Non-peptic ulcer, n (%)
Male (%)	20 (13.5)	9 (6.1)	5 (3.4)	6 (4.0)	86 (58.1)
Female (%)	9 (6.1)	3 (2.0)	4 (2.7)	2 (1.4)	33
Total	29 (19.6)	12 (8.1)	9 (6.1)	8 (5.4)	119
Etiology of CLD					
HBV	13 (44.8)				56
Alcohol	4 (13.8)				24
HCV	5 (17.2)				13
Autoimmune	1 (3.5)				4
NAFLD	1 (3.5)				0
Unknown	5 (17.2)				22
<i>H.Pylori</i> infection *	20 (71.4)				25

* *H.Pylori* testing was done for 81 patients only (for 28 with PUD and 53 with non ulcer)

5.3 Associated and risk factors of peptic ulcer

H. Pylori testing was done for 81 patients: 45 (55.6%) patients had positive result (serology/stool antigen) and 71.4% among patients with PUD had positive result. Helicobacter pylori infection, ascites and Child-Pugh class C were important factors relating to the presence of peptic ulcer. With bivariate analysis; there was no significant difference in mean age, sex, alcohol drinking, smoking, NSAID use and etiology of CLD between peptic ulcer and non-peptic ulcer groups. Multivariate logistic regression analysis was performed further for factors with $P < 0.25$ (*H. pylori* infection, serum albumin, Child-Pugh classification, ascites and age). Helicobacter pylori infection [OR: 3.65; 95% confidence interval (CI): 1.12–11.88; $P = 0.032$] was independently associated with the presence of peptic ulcer in cirrhotic patients.

Table 4: Results of bivariate and multivariate analysis

Variable	Peptic ulcer, n (%; N=29)	Non-peptic ulcer , n (%; N=119)	COR(95% CI)	P- value	AOR (95% CI)	P- value
Age						
18-30	9	50	1		1	
31-40	7	35	1.1(0.38-3.26)	0.803	1.01(0.26-3.83)	0.99
41-50	7	19	2.1(0.67-6.27)	0.210	3.1(0.64-14.96)	0.16
51-60	4	7	3 (0.77-13.12)	0.111	3.2(0.34-29.09)	0.32
>60	2	8	1.4(0.25-7.64)	0.706	1.8(0.19-17.52)	0.59
Sex						
Male	20 (69%)	86 (72.3%)	0.9(0.35-2.01)	0.724		
Female	9 (31%)	33 (27.7%)	1			
Etiology of CLD						
HBV	13	56	1			
Alcohol	4	24	0.7(0.21-2.42)	0.594		
HCV	5	13	1.6(0.50-5.47)	0.408		
Autoimmune	1	4	1.0(0.11-10.4)	0.949		
Unknown	5	22	0.9(0.31-2.67)	0.876		
Smoking						
Yes	2	4	2.1(0.37-12.2)	0.397		
No	27	115	1			
Alcohol **						
Yes	9	48	0.67(0.28-1.6)	0.358		
No	20	71	1			
NSAIDs						
Yes	2	3	2.8(0.45-17.9)	0.262		
No	27	116	1			
Ascites						
Yes	25	75	3(1.11-8.14)	0.023	2.7(0.54-13.81)	0.221
No	4	44	1		1	
Child class						
A	6	47	1		1	
B	13	62	1.6(0.58-4.64)	0.349	0.6(0.10-3.152)	0.504
C	10	10	7.8(2.3-26.55)	0.001	2.23(0.24-20.9)	0.483
Platelet count * (x 103/mic.L)	127.2 ± 107.4	113.9 ± 72.2		0.805		
Albumin * (g/dl)	1.82 ± 0.7	2.07 ± 0.7		0.205	1.2(0.26-5.25)	0.828
Total bilirubin* (mg/dl)	1.78 ± 1.6	1.65 ± 2		0.744		
<i>H.Pylori</i>						
Positive	20	25	2.8(1.05-7.49)	0.037	3.65(1.12-11.88)	0.032
Negative	8	28	1		1	

* Values are expressed as *mean ± s.d., **31 of 57 patients have significant alcohol consumption (=>3 drinks/day).

6. Discussion

This study presented the magnitude of peptic ulceration and its associated factors among CLD patients at SPHMMC. Gastrointestinal bleeding in the patients of liver cirrhosis is usually attributed to esophageal varices. However; peptic ulcer can be the cause of the upper GI bleeding instead of varices. Similarly dyspepsia in cirrhotic patients may occur due to an ulcer in about one-third of cases (31).

In our study the prevalence of PUD was 19.6% and from which DU was found in 8.1% cases. The high prevalence of peptic ulcer disease in patients with liver cirrhosis is consistent with previous reports. In a study done in South Korea, the prevalence of peptic ulcer disease in patients with cirrhosis was 24.3% (5). In a prospective study that was undertaken to determine the frequency of peptic ulceration in different forms of chronic liver disease; peptic ulceration was found in 14.7% of patients with CLD (28). The majority of peptic ulcers observed in our study were located in the duodenum which is against most other studies. This could be explained by: drugs are considered the main predisposing factor for the development of gastric ulcers and in this study only 5 patients had history of NSAIDs drug intake. There is one study that supports our finding that duodenal ulcer is more prevalent than gastric ulcer (28). In Nigerian study to describe different types of lesions that can be found in patients with liver cirrhosis during upper GI endoscopy shows duodenal ulcers in 7.1% of patients (29). There are also other several studies with consistent findings; high prevalence of peptic ulcer (32-34). From earlier studies, several changes of gastroduodenal mucosa in cirrhotic patients were explained from the reduction of potential difference in gastric mucosa, (35) impairment of bicarbonate secretion, (36) the reduction of gastric mucosal blood flow, (37) and the impairment of gastric mucosal oxygenation (38).

H. pylori infection is an established cause of peptic ulcer in non-cirrhotic patients; hence, many studies have tried to establish an association between peptic ulcer and *H. pylori* infection in cirrhotic getting mixed results (10, 25, 26, 39-40). In previous studies, the prevalence of *H. pylori* infection in cirrhotic ranged from 20-60% (26, 39-40). We also observed a high prevalence of *H. pylori* infection among cirrhotic (55.6%). Its prevalence among patients with peptic ulcer and non-peptic ulcer is 71.4% and 47.2% respectively.

In this study, *H. pylori* infection is one of associated factors and independent risk factor of peptic ulcer. Furthermore, our results support the conclusion of a meta-analysis that *H. pylori* infection is the most important risk factor of peptic ulcer in cirrhotic patients (3).

Child Pugh class C and ascites are also found to have association with peptic ulcer, although not seen on results of multi-variate analysis. Although only one study supports its association with ascites, (1) several studies showed strong association with Child Pugh classification of CLD. Otherwise, between peptic ulcer and non-peptic ulcer groups, there were no significant differences in age, sex, alcoholic drinking, smoking, serum albumin concentration and across etiologies of cirrhosis.

7. Strengths of the study

This study to the investigators knowledge is the first of its kind in Ethiopia that tries to look at the magnitude and associated factors of peptic ulcer in CLD patients. As it has been done in one of the biggest accredited center in the country, where patients for endoscopy are referred, individuals from different cities are represented.

8. Limitations of the study

- This study was carried out in only one center so it may not represent all cirrhotic patients.
- Its retrospective nature: some clinical information were not clearly documented on the patients chart like duration of NSAIDs use and *H. pylori* testing was not done for all patients.

9. Conclusion

Peptic ulcer disease is prevalent in patients with cirrhosis and *H. pylori* infection was the most important risk factor identified for PUD.

10. Recommendations

For Department of Internal Medicine and GI unit

- Peptic ulceration should be considered in any patient with cirrhosis during varices screening as most patients may not have dyspeptic symptoms (though it may need further study in our country)
- Emphasis should be given for *H. pylori* infection as it is the main risk factor for PUD
- In CLD patients presenting with upper GI bleeding, the possibility of bleeding peptic ulcer should be considered.

For Fellow Researchers and FMOH

- Further studies should be done to justify this finding and to confirm magnitude of the problem at a large in the country.
- It might contribute as an input for policy makers and MOH.

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12. Annexes

Annex I: Information sheet

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Annex II: Written consent form

This questionnaire is designed for a research work on Prevalence and associated factors of peptic ulcer among patients with chronic liver disease. I want to inform you that you have been selected conveniently for the purpose of the study and you have the right to withdraw from participation at any time during the interview. The information you give will be kept confidential and your name will not be used in the analysis. The fact that you have participated in the study will not interfere with the service you are going to receive here. If you wish to participate in the study, please affirm it with your signature on the area provided below

I place my signature as a sign of agreeing to participate _____

Thank you for participation and cooperation!

የጥናቱ መግለጫ

ጤና ይስጥልኝ። ይህ መጠይቅ የተዘጋጀው በቅዱስ ጳውሎስ ሚሊኒየም ሜዲካል ኮሌጅ በወስጥ ደዌ የትምህርት ክፍል ለድህረ ምረቃ ዲግሪ መመረቂያ በጉበት ሕመምተኞች ላይ ያለውን የጨንፈ መቁሰል ችግር ስርጭትና አጋላጭ ሁኔታዎች ላይ ለሚደረግ ጥናት ነው። እነዚህን ሁኔታዎች ማወቅን ችግሩን ለመቀነስ ምን መደረግ እንዳለበት አመለካከት ይሆናል።ክቡር መላሻችን ለጥናቱ የሚረዱ የተለያዩ ጥያቄዎች ይጠየቃሉ።

በዚህ ጥናት ላይ ተሳታፊ እንዲሆኑ የተደረገው የጉበት ሕመምተኛ በመሆኖ ሲሆን ጥናቱ ላይ የሚሳተፉት ፈቃደኛ ከሆኑ ብቻ ነው።ይህን ቃለ መጠይቅ ሲሞሉ ስምዎን እንዲጽፉ አይፈለግም።በመሆኑም ለሚያደርጉልን ቀና ትብብር በቅድሚያ ከልብ እናመሰግናለን።

የፈቃደኝነት መግለጫ

እኔ የጥናቱ ተሳታፊ የጥናቱን አላማ እና ጥቅም እንዲሁም ከእኔ የሚጠበቁትን ነገሮች ተረድቼአለሁ። ስሜ እና የምስጣቸው መረጃዎች ለሶስተኛ ወገን ተላልፈው እንደማይሰጡም ተረድቼአለሁ። ስለዚህም በጥናቱ ላይ ለመሳተፍ ፈቃደኛ ነኝ።

የተሳታፊው ፊርማ _____ ቀን _____

የመረጃ ሰብሳቢው ስም _____ ፊርማ _____ ቀን _____

Annex II: Questionnaire

I. Socio-demographic information

Card no. _____ Age _____

1. Sex: Male ☐ Female ☐
2. Marital status: Single ☐ Married ☐ divorced ☐ widower ☐
3. Educational level:
Illiterate ☐ Primary (1-8th grade) ☐ Secondary (9-12th grade) ☐ Higher education ☐
4. Employment status: Employed ☐ Unemployed ☐ Private business ☐
Retired ☐
5. Area of residence : Urban ☐ Rural ☐

II. Clinical information

Medical history

1. Is there any history of drug intake?

A. yes B. no

If yes which one?

A. ASA B. NSAIDs C. Prednisolone D. PPI E. Others

2. Is there any history of use of alcohol?

A. Yes B. No

3. If yes, number of drinks per week _____

4. Is there any history of cigarette smoking?

5. If yes, how many packs year _____

6. Did you told to have HBV, HCV or both?

A. Yes B. no

7. If yes which type? _____

III. Chart revision

1. Is the cause of the cirrhosis (CLD) known ?
 - a. Yes
 - B. noIf yes , which one
 - A. HBV
 - B. HCV
 - C. Alcoholic liver disease
 - D. Auto immune hepatitis
 - E. Drug induced liver disease
 - F. Others
2. Does the patient have CBC profile?
 - A. yes
 - B. noif yes , what is the platelet count
3. Findings of upper GI endoscopy?
 - A. Varices
 - B. duodenal ulcer
 - C. gastric ulcer
 - D. PHG
 - E. Other
4. Reasons for upper GI endoscopy.
 - A. Dyspeptic symptoms
 - B. Screening for varices
 - C. Upper GI bleeding
5. Does the patient have H.pylori testing? A. yes B. no
6. If yes, which one A. H.pylori stool antigen B. H.pylori serology
What is the result? A. Positive B. Negative
7. Does the patient have Liver function tests ?
 - A. Yes
 - B. noIf yes , please fill results below
 - i. PT
 - ii. PTT
 - iii INR
 - V. Total bilirubin.....
 - V. direct bilirubin.....
 - VI. Serum albumin level

8. Does the patient have ascites before upper GI endoscopy?
- A. Yes B. no
- If yes , what is the amount of ascites
- i. small
- ii. moderate
- iii. Large/severe
9. Does the patient have hepatic encephalopathy before procedure?
- A. Yes B. no
- If yes , what is the grading
- i. 1
- II. 2
- III. 3
10. If question 7,8 and 9 are done properly what is the Child class of CLD before upper GI endoscopy?
- A. Class A
- B. Class B
- C. Class C