



وَأَمَّا مَا يَنْفَعُ النَّاسَ فَيَمْكُثُ فِي الْأَرْضِ

اور جو لوگوں کو فائدہ پہنچاتا ہے وہ روئے زمین پر قائم رہتا ہے۔ (الرعد : ۱۷)

Which is for the good of mankind remains in the earth



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CORRIGENDUM

In the last **Pakistan J. of Gastroenterology, Vol. 27 (Biannual Apr. – Sep., 2013)**, published and circulated last year, the volume number was printed inappropriately as **Vol. 27**. Actually it was **Vol. 28 Biannual October 2013**).

Therefore, it should be read as **Pakistan J. of Gastroenterology, Vol. 28 (Biannual October 2013)** for future reference.

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GASTROESOPHAGEAL REFLUX DISEASE (GERD)

Gastroesophageal reflux disease (GERD) or dyspepsia is recurrent or persistent discomfort or pain involving upper abdomen which is characterized by early satiety, postprandial fullness, nausea, and bloating. In Pakistan though hospital-based surveys are showing upto 24% prevalence, actually it is more in general people both in the cities and villages as well due to modernization of life style, food choices and their timings.

Reflux of gastric juices and hiatus hernia are the most common causes. Adults with GERD usually encounter the symptoms after eating a meal, lying on their backs, when bending over or if they are lifting heavy weight things. Symptoms often become very distinct during the night. GERD is very commonly noticed in pregnant women (> 50% experience acid reflux and/or heartburn). If symptoms and reflux episodes occur together < 25% or > 75% of time, causal association is low or high respectively. In symptomatic patients who are using aggressive acid suppressive therapy, demonstration of complete acid suppression clearly indicates that acid reflux is not a major factor, and if acid reflux is still occurring then there is a need of different therapy.

Adults with GERD, may experience any of the symptoms, including heartburn, belching, regurgitation, bad breath (halitosis), nausea, dysphagia, odynophagia (painful swallowing), chest pain, particularly after eating, water brash (increased salivation), reflux esophagitis, peptic stricture in esophagus, Barrett's esophagus, esophageal carcinoma, abdominal pain, sinusitis, asthma, laryngitis, pharyngitis, sensitive teeth, choking feeling, chronic coughing, and damage to the esophagus itself. The damaged esophagus will begin to scar, may start to become narrow resulting strictures formation, which can lead to dysphagia. If the esophagus is injured even more, it could evolve to Barrett's esophagus; will cause the esophagus to change in color and shape, and there is a raised risk of cancer too.

Gastroesophageal reflux disease (GERD) is a more crucial form of Gastroesophageal reflux (GER), also called acid regurgitation or acid reflux. Here digestive juices – called acids –go up along with the food commonly. It occurs when the LES relax to open spontaneously, for variable period of time, or does not close properly and contents from the stomach rise up into the esophagus. GER occurs when there is failure

of normal anti - reflux mechanism to protect against abnormal frequency and quantity of GER. GER itself is not a disease process but rather a normal physiologic phenomenon, which occurs many times each day, especially after large meals, without making symptoms or mucosal damage. When acid reflux occurs, fluid or food can be tasted in the back part of the mouth. When refluxed stomach acid meets the lining of the esophagus it may result burning sensation in the throat or the chest called acid indigestion or heartburn. Persistent reflux that happens more than twice a week is labeled as GERD, and it can ultimately bring about more serious health problems. People of any age group can suffer GERD. Two factors contribute to mucosal damage i.e., direct toxic injury and prolonged mucosal contact time with gastric acid or pepsin or both.

Esophageal clearance occurs by primary or secondary peristaltic waves. Acid neutralization by swallowed saliva and esophageal mucosal resistance, acid residue at mucosal surface maintains low esophageal pH immediately after peristaltic contractions. Salivary bicarbonate neutralizes mucosal pH in a stepwise fashion in 8 – 10 swallows. Duration of time from reflux event until restoration of normal esophageal pH is the Esophageal Acid Clearance Time. Delayed gastric emptying leads to retention of solid foods, secretion of food - induced acid, gastric distension and LES relaxations. In post – prandial state, possible delayed gastric emptying results in increased esophageal acid contact time.

Drugs may aggravate GER by decreasing LES pressure e.g. beta – agonist, theophylline, anticholinergic, tricyclic anti – depressants, progesterone, diazepam & calcium channel blockers or direct esophageal mucosal injury e.g. tetracycline, quinidine, KCL, iron, NSAIDs, Aspirin, Alendronate. Hiatus hernia is present in 50% patients having > 50 years of age. Endoscopically 80% patients with GERD have hiatus hernia and > 50% patients of hiatus hernia do have GERD. On endoscopy, majority of the patients have no visible damage in the mucosal lining (non-erosive GERD/NERD), whereas others have reflux esophagitis, stricture formation or Barrett's change in the esophagus. Severe esophageal mucosal disease almost guarantees presence of hiatus hernia and may results in melena, vomiting blood or coffee ground looking material, dysphagia, anemia (low blood count),

un-explained weight loss. Patients with GERD and its complications should be checked carefully by a gastroenterologist. GERD may deteriorate or initiate the chronic cough, asthma, and pulmonary fibrosis.

Anatomical anti - reflux barrier is a fortress, composed of LES, crural diaphragm and phrenoesophageal ligament, regulated at distal end by 2 distinct sphincters, Internal LES can resist upto 90 mmHg pressure and an external LES. Lower Esophageal Sphincter (LES) is a muscular ring lying at the distal end of the esophagus. It acts as a valve between the stomach and the esophagus. Hiatus hernia is the most important factor involved in reducing its strength by decreasing LES pressure, inhibits external LES from assisting internal LES to prevent high - pressure induced GER and hence increasing frequency of GER, impairing esophageal clearance of refluxed acid and provoking duodeno - gastric reflux, though tobacco and NSAIDs do contribute. Surgical restoration of anatomical arrangements improves and heals esophagitis without increasing LES pressure. Known foods that can aggravate reflux symptoms include, chocolate, citrus fruits, onion and garlic, drinks with alcohol or caffeine, fatty and fried foods, tomato - based foods, spaghetti sauce, mint flavoringspicy foods, salsa, pizza and chili.

Lifestyle changes are important in relieving GERD symptoms like, if patient smokes, ask and convince to stop, lose weight if desired, avoid beverages and foods that worsen symptoms, eat dry, small, and frequent meals, do not lay down for 3 hours since after last meal, always wear loose clothes, elevate the head end of the bed approximately 6 to 8 inches by placing wooden blocks under the bed pillars, just using additional pillows will not be helpful.

Foaming agents, for example Gaviscon, act by covering the contents in the stomach with foam to prevent reflux. Anti-histamine (H_2 blockers), like famotidine, cimetidine ranitidine, and nizatidine provide short - term relief by decreasing acid production and are effective for about half of these patients with GERD. Proton pump inhibitors (PPI) including pantoprazole, omeprazole, rabeprazole, lansoprazole, esomeprazole, and dexlansoprazole are more potent than H_2 blockers and can provide more symptoms relief and settle the esophageal lining in almost everyone who has GERD. Prokinetics including metoclopramide and bethanechol, makes the LES strengthen and make the stomach empty faster, which also improves muscle action in the digestive tract. Prokinetics have multiple adverse effects that bound their helpfulness - sleepiness, fatigue, anxiety, depression and problems related with physical movement.

If the symptoms do not settle with lifestyle

changes or medications, then additional testing may be required, where barium swallow radiograph can detect abnormalities like hiatal hernia and other anatomical or physical problems of the esophagus but will not perceive mild irritation, although strictures or ulcers of the esophagus can be detected. Upper GI endoscopy is more precise than a barium swallow radiograph. pH monitoring examination for 24 to 48 hours while patient does routine activities, the device measures how much and when acid comes up into the esophagus. This test can be more fruitful if combined with a cautiously completed diary - recording including when, and what amounts eaten - which allows seeing associations between symptoms and reflux episodes. The procedure is sometimes useful in describing that whether respiratory complaints, including coughing and wheezing, are triggered by reflux.

Surgery is an option when lifestyle changes as well as medicine do not help to treat GERD symptoms. Fundoplication is the recommended surgical treatment option for GERD i.e., Nissen fundoplication.

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Prof. Muhammad Arif Nadeem
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MORTALITY CAUSES IN PATIENTS WITH CHRONIC LIVER DISEASE IN PAKISTAN

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ABSTRACT

Background: Viral hepatitis related cirrhosis is one of the major health problems in Pakistan. In viral hepatitis, hepatitis C is known as the leading cause of cirrhosis that may also lead to death in our population. Proper management in cirrhotic patients can play a vital role in preventing mortality and to prolong lifespan of these patients.

Objectives: To evaluate the factors contributing as major causes of death in the patients with chronic liver disease (CLD) in Pakistan.

Methods: Data was collected from 89 patients (46 males and 43 females), presenting in the outdoor and emergency department of Shalamar Hospital Lahore, starting from January 2016 to October 2017. The patients age range was 35-93 years (mean = 58.29). Patients were labeled as CLD based on the laboratory evidences (i.e., LFTs and viral serology) and ultrasound findings.

Results: Out of 89 cirrhotic patients majority had viral etiology (79 HCV and 2 HBV positive patients). Twenty three (25.84%) from 89 patients had diagnosed hepatocellular carcinoma based on CT scan findings and elevated alpha-fetoprotein levels. Altered sensorium was the major complaint of the patients upon arrival to the hospital followed by variceal bleeding and abdominal distention. Regarding the cause of death, Sepsis was found in 41.57% of the patients making it the major contributory factor towards the mortality. Findings of hepatorenal syndrome were consistent with the death of 35.95% patients. The patients with upper GI bleeding, spontaneous bacterial peritonitis (SBP), pneumonia and resistant encephalopathy were 28.08%, 11.23%, 7.86%, 15.73% respectively.

Conclusions: Sepsis was found to be the major cause of mortality in patients with chronic liver disease in present study. Urinary tract infections (UTI), spontaneous bacterial peritonitis (SBP) and pneumonia were found the major culprits leading to sepsis. Hepato-renal syndrome (HRS) and variceal hemorrhage were the other significant factors causing death in CLD patients.

Key Words: Chronic liver disease; factors; mortality; Pakistan.

INTRODUCTION

Cirrhosis results from chronic liver disease, and is characterized by advanced fibrosis, scarring, and formation of regenerative nodules leading to architectural distortion.¹ In the past cirrhosis was generally thought to be irreversible but recent studies have shown that treatments aimed at the underlying cause especially in earlier stages of the disease can improve or even reverse fibrosis.^{2,3} In 2010, cirrhosis was the eighth leading cause of death in the United States and combined with its complications accounted for approximately 49500 deaths.⁴

In the Western world alcoholism is the major cause of cirrhosis, whereas in Pakistan hepatitis C virus infection is its established leading cause.^{5,6}

Studies conducted recently in Karachi show 43.06% seropositivity of HCV patients with 45.7% cases of CLD and 37.7% of cirrhosis.⁷

Other major causes of cirrhosis in Pakistan include hepatitis B virus, NAFLD, autoimmune hepatitis, hemochromatosis, Wilson's disease, alcoholism, PSC and PBC. We label a patient as a case of chronic liver disease when there is radiological and biochemical evidence of cirrhosis i.e., deranged LFTs, disturbed coagulation profile and fall in platelets. Decompensation is marked by hepatic failure that includes coagulopathy, hepatic encephalopathy, and hyperammonemia. It also includes portal hypertension leading to ascites, hepatosplenomegaly, port-systemic shunts (variceal bleeds and caput medusa) and

hepatorenal syndrome (leading to reversible renal failure).⁸

All of the above stated complications can lead to the mortality of a patient with chronic liver disease. The aim of this study was to identify the major causes of death in patients of CLD in Pakistan so that focus can be shifted towards devising a plan to prevent these complications beforehand.

MATERIALS AND METHODS

In present retrospective study, the patients with chronic liver disease (CLD) and died in the hospital setting from January 2016 to October 2017 were selected. A total of 89 patients (46 males and 43 females) from emergency or OPD of the Shalamar hospital, Lahore with either previously or currently CLD diagnosed were enrolled. Questionnaires were designed focusing on patient's bio data, disease history, etiology of their CLD, laboratory investigations, and radiological profile (abdominal ultrasound, chest radiography, abdominal CT scan and endoscopic findings). Data was collected from patients being admitted in the medical wards and from the hospital records dating back to February 2016. Keeping in view that not all the above investigations could be performed in every patient, the cause of death was established after analyzing the above collected data and the mode of presentation of the patient in the hospital.

RESULTS

A total of 89 patients 46 (51.69%) males and 43 (48.31%) females participated in this study as revealed in figure 1. The minimum age of the patients participated in the present study was 35 years and maximum was 93 years with a mean of 58.29. Out of 89 CLD patients, 79 (88.76%) (39 or 43.82% males and 40 or 44.94% females) had hepatitis C, 2 (2.24%) male patients had hepatitis B and the rest of the 8 patients (8.99%) fell under the category of non-B, non-C hepatitis as shown in table 1. Twenty three (25.84%) patients out of 89 had hepatocellular carcinoma (HCC) out of which 12 were males and 11 female.

Regarding the mode of presentation of these patients in the hospital setting as depicted in table 2, 36 (40.45%) patients had altered sensorium, 24

(26.97%) had upper gastrointestinal bleeding in the form of hematemesis and melena, 17 (19.10%) had the chief complain of rapidly progressive abdominal distention and pain whereas 13 (14.61%) patients presented with other generalized complaints like fever, jaundice, shortness of breath and anuria. It is also important to note that some patients had more than one major presentation upon arrival to the hospital.

When calculating the cause of death in these 89 patients, sepsis contributed in 37 (41.57%), hepatorenal syndrome in 32 (35.96%), upper GI bleeding (UGIB) in 25 (28.09%), spontaneous bacterial peritonitis (SBP) in 10 (11.23%), Pneumonia (either nosocomial or aspiration) in 7 (7.87%) and resistant encephalopathy in 14 (15.73%) patients. Other causes such as hepatopulmonary syndrome, ventricular tachycardia and atrial fibrillation were examined in 4 (4.49%) patients. The frequencies of these causes and their gender wise distribution within our pool of the patients are shown in table 3.

Furthermore, the factors that may perhaps contributed in the mortality of CLD patients were anemia (hemoglobin less than 10g/dL) figure 1. Elevated leukocyte count was observed patients and majority of those were found contributing in sepsis and SBP. Sepsis and SBP were also contributing quite massively towards mortality in CLD patients.

Decline in the synthetic function of liver because of cirrhosis was also observed in our patients. It was recorded that 84 (94.38%) out of 89 patients had hypo-albuminemia (serum albumin > 3.5g/dL) with the rest having normal serum albumin levels. Platelet count less than 150,000/mm³ was present in 62 (69.66%) patients, while 58 (65.16%) patients had deranged coagulation profile (elevated PT and INR) keeping in view both these defects are a contributing factor towards GI bleeding which is another significant cause of death.

However, coagulation profile was not performed in 23 patients and 8 patients had normal PT and INR. Serum alpha fetoprotein (AFP) levels were elevated in 9 (10.11%) patients that were taken as a sign of HCC and 15 (16.85%) patients out of 89 had normal levels. It is of note that 2 female patients having HCC (diagnosed by CT scan) had normal AFP levels.

Table 1: Gender Wise Etiological Distribution of the CLD Patients.

Gender	Hepatitis C (n = 89)	Hepatitis B (n = 89)	Non-B, non-C Hepatitis (n = 89)
Males	39 (43.82%)	2 (2.2%)	5 (5.62%)
Females	40 (44.94%)	0 (%)	3 (3.37%)
Total	79 (88.76%)	2 (2.24%)	8 (8.99%)

Table 2: Distribution of Presenting Complaints of the Patients on Hospital Visit.

Gender	Altered Sensorium	Upper GI Bleed	Abdominal Distention	Others
Male	15	11	12	8
Female	21	13	5	5
Total	36 (40.45%)	24 (26.97%)	17 (19.10%)	13 (14.61%)

Table 3: Mortality Pattern among CLD Patients.

Gender	Sepsis	HRS	UGIB	SBP	Pneumonia	Resistant Encephalopathy	Others
Males	20	19	11	8	5	7	2
Females	17	13	14	2	2	7	2
Total	37 (41.57%)	32 (35.95%)	25 (28.08%)	10 (11.23%)	7 (7.86%)	14 (15.73%)	4 (4.5%)

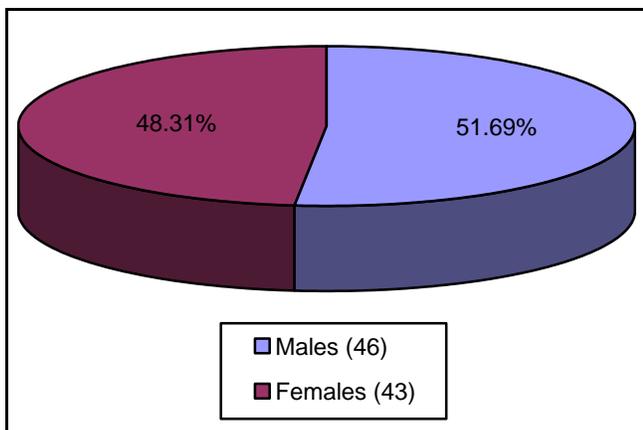


Fig. 1: Gender Wise Distribution of the Patients.

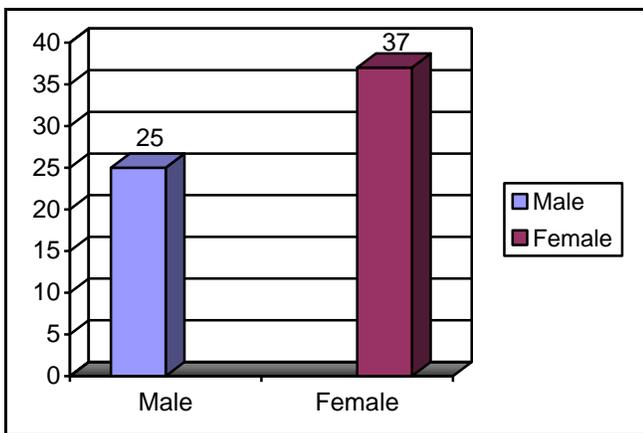


Fig. 2: Anemic Patients.

DISCUSSION

Chronic liver disease (CLD) has become a major health hazard in Pakistan as well as worldwide and hepatitis C virus (HCV) is known as a major contributor in this regard.^{6,9} Viral infection always remained a major cause of mortality in CLD patients¹⁰ that was also examined in present study, where a huge percentage (91.01%) of the CLD patients was because of hepatitis C and hepatitis B. However, chronic alcoholism was found to be a cause of CLD in only 2 (2.24%) patients in our findings that was in contrast to European regions where alcoholism was reported the major cause of CLD.⁵

Common complications that can arise from CLD include encephalopathy, spontaneous bacterial peritonitis, hepato-renal syndrome, variceal bleeding, ascites and portal hypertension¹¹. Anemia of diverse etiologies was also reported previously in about 75% of the patients with CLD¹² that was much similar to our study where 69.66% of the patients were found to be anemic. Various studies done in Pakistan established encephalopathy as the commonest complication of CLD^{10,13} that was also similar to our study where encephalopathy was the major presentation of CLD patients in the hospital.

Being well aware of these complications it was important to have an idea about the major factors and causes leading towards death in CLD patients which may help to adopt preventive measures to improve disease outcomes in these patients. In this study sepsis was established to be the major cause of mortality in CLD patients with a prevalence of 41.57% that was much similar to data obtained from a study done in

North America¹⁴. However, most of the infections in that study were attributed to pneumonia, but evidence of pneumonia in present study was found only in 7 (7.87%) patients. We also examined UTI the cause of sepsis in majority of our female population.

It was also reported previously that most of the fatal infections occurred in the setting of ascites¹⁴ whereas in our study about 19% of the population had clinically evident ascites upon presenting to the hospital and SBP being the cause of death in 11.23% cases. In contrast, gastrointestinal bleeding was found to be the major manifestation and cause of death in 33 CLD patients presenting over a span of 1 year in Shifa International Hospital, Islamabad in 2003.¹⁵

A major difference in our population and the western society arises when reviewing rest of the sequel of CLD. As in our study upper GI bleeding and associated hypovolemic shock was found to be the cause of mortality in 28.09% patients and HRS being the contributory cause in 35.96% whereas in a study done in North America in 2006, 13(17.81%) out of 73 patients of CLD died because of variceal hemorrhage and only 5 (6.85%) had renal failure at the time of death.¹⁴ It shows that the better healthcare facilities including regular screening and prompt treatment in the western society has prevented renal failure and variceal hemorrhage those are known as the major contributory factors in the death of cirrhotic patients.

Another noteworthy finding is the incidence of HCC that was 25.80% in our population. However, studies conducted in Italy and Japan showed an HCV incidence of 44 – 46% and 80% respectively.^{16,17} Keeping in view the burden of HCV infection in our population, it is important to improve our screening standards for HCC that was found prominent in our population where no proper screening for HCC was done.

CONCLUSION

The contribution of sepsis in mortality burden of CLD patients was prominent in our findings. Urinary tract infections, spontaneous bacterial peritonitis and pneumonia were the most common preventable infections leading to sepsis in our population. Therefore as health care professionals we should be very vigilant in preventing and promptly treating sepsis and renal failure from developing in patients of CLD admitted in our hospital settings. Endoscopic screening for upper GI varices should also be adopted in order to prevent any massive life hemorrhage. In light of these findings the focus should be diverted towards finding ways to prevent and treat these life threatening complications from arising in the setting of cirrhosis in order to improve health and reduce mortality in CLD patients.

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HEMATOCHEZIA, ITS FREQUENCY DISTRIBUTION IN VARIOUS AGE GROUPS AND SIGMOIDOSCOPIC DIAGNOSES: A RETROSPECTIVE COHORT STUDY

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ABSTRACT

Objective: To determine age wide prevalence of diseases causing hematochezia in those patients who underwent sigmoidoscopy at Liver Clinic, Lahore – Pakistan.

Study Design: Retrospective cohort study.

Methodology: In a retrospective analysis of 186 patients who underwent sigmoidoscopy for the indication of hematochezia, gender, age group, hematochezia, and sigmoidoscopic diagnosis were the qualitative variables, while age of the patients was the only quantitative variable. The entire data was evaluated on SPSS version 15. During descriptive interpretation of data, means and standard deviations were calculated for the presentation of quantitative variable, and frequencies and percentages were computed for qualitative variables. The age wide distribution of hematochezia as well as sigmoidoscopic diagnosis was also done.

Results: Out of the total of 186 patients, 68.3% were male and 31.7% female. Their mean age was 41.42 + 15.51 years. The distribution of patients who presented with hematochezia in different age groups was as follow: 4 (2.2%) patients in group 1 (childhood: age < 13 years), 7 (3.8%) patients in group 2 (adolescence: age 13 – 18 years), 97 (52.2%) patients in group 3 (young adults: age 19 – 44 years), 68 (36.6%) patients in group 4 (middle aged adults: age 45 – 65 years), and 10 (5.4%) patients in group 5 (older adults: age > 65 years). The most common etiology for hematochezia was internal hemorrhoids (n = 99, 53.2%) followed by ulcerative colitis (n = 40, 21.5%), colorectal polyps (n = 21, 11.3%), discrete ulcerations (n = 16, 8.6%), pseudomembranous colitis (n = 8, 4.3%), SRUS (n = 5, 2.7%), vascular malformation (n = 4, 2.2%), malignancy (n = 3, 1.6%), rectal varix (n = 1, 0.54%), and anal fissure (n = 1, 0.54%). One patient had normal sigmoidoscopic findings. All mentioned diseases were more prevalent in group 3 patients which included young adults except malignancy and rectal varix that were prevalent in patients older than 65 years of age i.e. group 5 patients.

Conclusion: Hematochezia is more prevalent in young adults in our population. Sigmoidoscopy is diagnostic and in majority of the patients, one may not need from complete colonoscopy with colonic preparation. Internal hemorrhoid is the commonest etiology of hematochezia followed by ulcerative colitis, colorectal polyp, and other miscellaneous disorders.

Keywords: Hematochezia, Sigmoidoscopy, Age groups.

INTRODUCTION

Hematochezia is the fresh blood in or with stools, which mostly occurs from lower gastrointestinal (GI) tract.¹ Its lower GI etiologies include hemorrhoids, anal fissure, polyps, malignancy, vascular malformations, proctitis, colitis etc. Rarely, it occurs due to brisk upper GI bleeding.² Worldwide, hematochezia is more common in men than in women,³ and the commonest etiology is diverticular hemorrhage.⁴ However, in Pakistan, reverse has been

reported where internal hemorrhoids is the commonest culprit for hematochezia.⁵ After initial assessment and resuscitation, early lower GI endoscopy to localize the bleeding site, preferably with therapeutic intervention is efficacious and fantabulous.⁶ Flexible sigmoidoscopy is a walk-in-clinic procedure.⁷ It proves diagnostic and mostly therapeutic as well, in a large proportion of patients and escapes them from a later need of complete colonoscopy, that requires at least two days colonic

preparation.⁸ Radiographic intervention like angiography is considered if ongoing bleeding does not respond adequately to resuscitation or endoscopy is not feasible.⁹ The age of the patients can be categorized into childhood, adolescence, and adulthood.¹⁰⁻¹¹ Some diseases are more common in specific age groups. For example, juvenile rectal polyps are common in childhood.¹² Similarly, colorectal malignancies are more prevalent on older patients. The data regarding the prevalence of different diseases that present with hematochezia in different age groups is scarce. The objective of this study was to provide the age wise prevalence of diseases causing hematochezia in those patients who underwent sigmoidoscopy at Liver Clinic, Lahore, Pakistan.

METHODOLOGY

This was a retrospective cohort study carried out at Liver clinic, 250 Shadman Lahore. All the patients who underwent sigmoidoscopy for hematochezia from February 2010 to December 2013 were included. The age of the patients was categorized into childhood if < 13 years, adolescence if 13 – 18 years, young adults if 19 – 44 years, middle aged adults if 45 – 65 years, and older adults if > 65 years.^{6,7} Diffuse ulcerations with loss of vascular pattern were predictive of Ulcerative colitis. Discrete ulcerations were clustered separately where probabilities were infectious colitis (amoebic, tuberculous, salmonella, CMV), Crohn's diseases, NSAIDs induced colopathy, vasculitic colitis, and Behcet's disease. Other sigmoidoscopic diagnoses made were internal hemorrhoids, colorectal polyps, pseudomembranous colitis, solitary rectal ulcer syndromes (SRUS), vascular malformation, malignancy, rectal varix, and anal fissure. The gender, age group, hematochezia, and sigmoidoscopic diagnosis were the qualitative variables, while age of the patients was the only quantitative variable. The entire data was evaluated on SPSS version 15. During descriptive interpretation of data, means and standard deviations were calculated for the presentation of quantitative variable, and frequencies and percentages were computed for qualitative variables. The age wide distribution of hematochezia as well as sigmoidoscopic diagnosis was also done.

RESULTS

A total of 186 patients underwent sigmoidoscopy for the indication of hematochezia, out of which 127 (68.3%) were male and 59 (31.7%) were female. Their age ranged from 7-95 years, with a mean value of 41.42 + 15.51. The distribution of patients who presented with hematochezia in different age groups was as follow: 4 (2.2%) patients in group 1 (childhood: age < 13 years), 7 (3.8%) patients in group 2 (adolescence: age 13 – 18 years), 97 (52.2%) patients in group 3 (young adults: age 19 – 44 years), 68 (36.6%) patients in group 4 (middle aged adults: age 45 – 65 years), and 10 (5.4%) patients in group 5 (older adults: age > 65 years) (Table 1) (Picture 1).

Table 1: Age wide distribution of patients who presented with hematochezia (n = 186).

Age Groups	Frequency (Percent)
Group 1 (Childhood: age < 13 years)	4 (2.2%)
Group 2 (Adolescence: age 13 – 18 years)	7 (3.8%)
Group 3 (Young adults: age 19 – 44 years)	97 (52.2%)
Group 4 (Middle aged adults: age 45 – 65 years)	68 (36.6%)
Group 5 (Older adults: age > 65 years)	10 (5.4%)

The most common etiology for hematochezia was internal hemorrhoids (n = 99, 53.2%) followed by ulcerative colitis (n = 40, 21.5%), colorectal polyps (n = 21, 11.3%), discrete ulcerations (n = 16, 8.6%), pseudomembranous colitis (n = 8, 4.3%), SRUS (n = 5, 2.7%), vascular malformation (n = 4, 2.2%), malignancy (n = 3, 1.6%), rectal varix (n = 1, 0.54%), and anal fissure (n = 1, 0.54%). One patient had normal sigmoidoscopic findings. All mentioned diseases were more prevalent in group 3 patients which included young adults with age between 19 – 44 years in our data except malignancy and rectal varix that were prevalent in patients older than 65 years of age i.e. group 5 patients (Table 2).

Table 2: Age wide prevalence of disorders that presented with hematochezia (n = 186).

Diagnosis	Age groups (Frequency/Percent)					Total (Frequency/Percent)
	1	2	3	4	5	
1. Internal hemorrhoids	0 (0%)	0 (0%)	51 (51.5%)	43 (43.4%)	5 (5.1%)	99 (53.2%)
2. Ulcerative colitis	0 (0%)	3 (7.5%)	26 (65%)	8 (20%)	3 (7.5%)	40 (21.5%)

3. Colorectal polyps	3 (14.3%)	1 (4.8%)	9 (42.8%)	8 (38.1%)	0 (0%)	21 (11.3%)
4. Discrete ulcerations	1 (6.2%)	2 (12.5%)	6 (37.5%)	6 (37.5%)	1 (6.2%)	16 (8.6%)
5. Pseudomembranous colitis	0 (0%)	0 (0%)	7 (87.5%)	0 (0%)	1 (12.5%)	8 (4.3%)
6. SRUS	0 (0%)	1 (20%)	4 (80%)	0 (0%)	0 (0%)	5 (2.7%)
7. Vascular malformations	0 (0%)	0 (0%)	2 (50%)	2 (50%)	0 (0%)	4 (2.2%)
8. Malignancy	0 (0%)	0 (0%)	0 (0%)	1 (33.3%)	2 (66.6%)	3 (53.2%)
9. Rectal varix	0 (0%)	0 (0%)	0 (0%)	0 (0%)	1 (100%)	1 (53.2%)
10. Anal fissure	0 (0%)	0 (0%)	0 (0%)	1 (100%)	0 (0%)	1 (53.2%)
11. Normal findings	0 (0%)	0 (0%)	0 (0%)	1 (100%)	0 (0%)	1 (53.2%)

1 = Childhood; 2 = Adolescence; 3 = Young adults; 4 = Middle aged adults
 5 = Older adults; SRUS = Solitary rectal ulcer syndrome

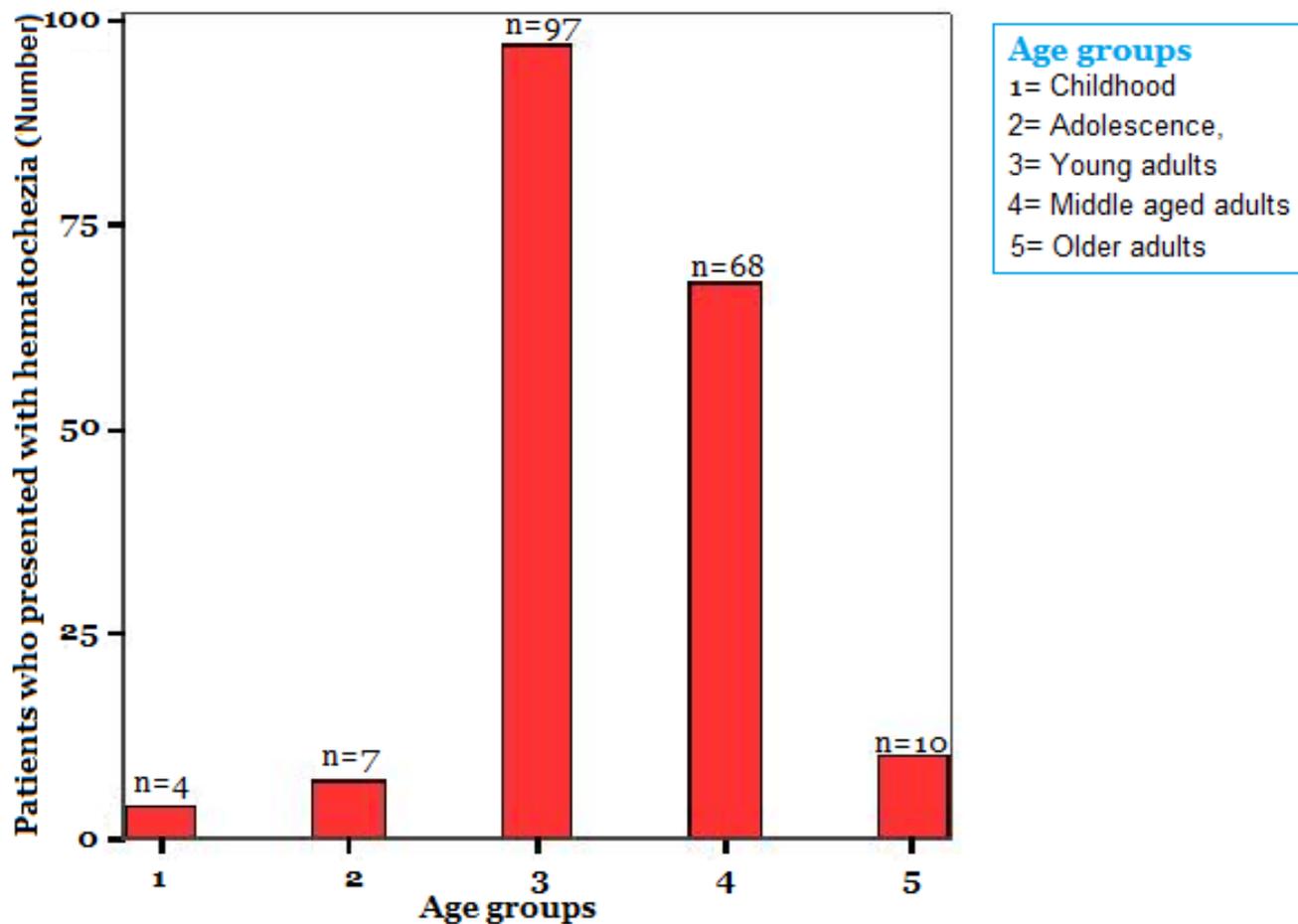


Fig. 1:

DISCUSSION

International data suggests that hematochezia is more frequent in men.³ Our data also provided similar findings where 68.3% patients with hematochezia were male. Literature showed that hematochezia is predominantly a disease of the elderly, with an average age of 63-66 years.^{13,14} Our study showed a dumbbell shape distribution of hematochezia in different age groups where 52.2% patients were young adults with age of 19 to 44 years and 36.6% patients were middle aged adults with age 45 to 65 years and, only 5.4% were older adults with age above 65 years. Perhaps this difference was due to different etiology for hematochezia in our population. Multiple studies^{15,16,17} from western countries identified the diverticular hemorrhage as the commonest etiology for hematochezia. While Bhatti and Quraishy⁵ from Pakistan found that the commonest cause for hematochezia was internal hemorrhoids. Similarly, in our data the commonest etiology for hematochezia was internal hemorrhoids (53.2%) while not a single case of diverticular hemorrhage was found. A similar study from Korea¹⁸ found internal hemorrhoids being the commonest endoscopic diagnosis (67.6%) in patients with hematochezia. I say, it is the geographic difference from east to west. Larger studies are required to validate these findings.

One more point to elaborate is that among 186 patients in our study who underwent sigmoidoscopy for hematochezia, only one patient had normal findings, which needed complete colonoscopy to find the cause of bleeding. Hence, among endoscopic intervention, cheap and quick sigmoidoscopy solve the problems of most of the patients and a very few need complete colonoscopy with colonic preparation. Our data suggested that all causatives for hematochezia were common in group of patients who were young adults with age 19 to 44 years, except malignancy and rectal varix which were prevalent in group of older patients with age more than 65 years. To elaborate these findings, larger studies are required.

CONCLUSION

Hematochezia is more prevalent in young adults in our population. Sigmoidoscopy is diagnostic and in majority of the patients, one may not need complete colonoscopy with colonic preparation. Internal hemorrhoid is the commonest etiology of hematochezia followed by ulcerative colitis, colorectal polyp, and other miscellaneous disorders.

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ENDOSCOPIC FINDINGS OF PATIENTS REPORTING WITH UPPER GASTROINTESTINAL SYMPTOMS – A STUDY OF 2412 CASES AT RED CRESCENT GENERAL HOSPITAL SUKKUR AND AT GHULAM MUHAMMAD MAHAR MEDICAL COLLEGE HOSPITAL SUKKUR

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ABSTRACT

Aims: To find the frequency of different endoscopic findings of patients reporting with upper gastrointestinal symptoms in a tertiary care hospital in upper part of Sind at Sukkur.

Methods: The data in the form of reports was converted into computerized form. All of the cases were thoroughly reviewed regarding their age, gender, indication for undergoing endoscopy, investigations and findings of the endoscopy.

Results: A total of 2412 patients were included in this study. The common endoscopic findings were antral Gastritis 170 (7.1%), Gastroesophageal reflux disease 256 (10.7%), hiatus hernia 178 (6.5%), large esophageal varices 373 (15.00%), pangastritis 604 (25%), gastric malignancies and esophageal malignancies were 53 (2.1%) and 36 (1.6%). Other less common findings were small esophageal varices, esophageal candidiasis, esophagitis, peptic ulcer, duodenitis, and duodenopathy. The most common symptoms that make the patients to undergo upper GI endoscopy were screening for varices, abdominal pain, hematemesis and melena.

Conclusion: Endoscopy is a gold standard tool for patients having upper gastrointestinal symptoms to differentiate benign from malignant causes.

Key Words: upper GI endoscopy, Gastroesophageal reflux disease, esophageal varices, pangastritis

INTRODUCTION

Upper GI endoscopy is considered a gold standard procedure for patients with upper abdominal symptoms. Barium study which has remained mainstay diagnostic modality for decades, has limited sensitivity and specificity in diagnosing gastrointestinal (GI) related illness with no provision to take histological sample.^{1,2} Now it is only performed for patients not fit for endoscopy. Esophago-gastro duodenoscopy (EGD) can conclusively diagnose peptic ulcer disease, gastro esophageal reflux disease, gastric erosions and malignancies.³⁻⁵

With EGD we can examine esophagus, stomach and duodenum up to second part.

The Association of Coloproctology of Great Britain and Ireland, British Society of Gastroenterology and Association of upper Gastrointestinal Surgeons of Great Britain and Ireland recommend upper GI endoscopy for patient with dysphagia, unexplained upper abdominal pain and weight loss, upper abdominal mass with or without dyspepsia, persistent vomiting and weight loss, unexplained weight loss, iron deficiency anemia, unexplained worsening of dyspepsia, patients aged ≥ 55 years with unexplained

and persistent recent-onset dyspepsia (after stopping treatment with PPIs), abnormal or suspicious findings on barium studies, CT or US scanning. This study was carried out to determine endoscopic findings of patients with upper gastro intestinal symptoms and where necessary biopsies were taken.

MATERIALS AND METHODS

Patients included in study were 2412. This retrospective observational study was carried out at Red Crescent General Hospital Sukkur, Sindh, Pakistan and Ghulam Muhammad Mahar Medical College Hospital Sukkur, from January 2013 to May 2016.

Data was retrieved from report record of endoscopy unit with consent of endoscopist. Patient's age, gender, indication for endoscopic procedure, available labs and findings of procedure were recorded and analyzed using IBM statistics 24 (Trial version).

Upper gastrointestinal endoscopies were performed under conscious sedation using Xylocaine 4% gargles and injection midazolam 2.5 mg after informed consent. Biopsies were taken where necessary for histopathology.

RESULTS

Out of total 2412 patients, 1126 (46.6%) were female and 1283 (53.1%) were male with male to female ratio of 1.13:1. Age ranged from 5 to 88 years with a mean of 40.07 years. Frequency of different findings noted during endoscopy is shown in table no 1.1 and 1.2. Thirty four endoscopies were normal.

Table 1.1: *Common Endoscopic Findings.*

Endoscopic Findings	Male (n= 1283)	Female (n=1126)	Total (n=2412)
Pangastritis	298	306	604 (25%)
Large Esophageal Varices	257	116	373 (15.00%)
GERD	129	127	256 (10.7%)
Antral Gastritis	50	120	170 (7.1%)
Hiatus Hernia	90	88	178 (6.5%)
Esophageal Malignancies	14	22	36 (1.6%)
Gastric Malignancies	29	24	53 (2.1%)

Table 1.2: *Less Common Findings.*

Endoscopic Lesions	Male (n=185)	Female (n=109)	Total (n=294)
Small esophageal varices	49	13	62 (2.5%)
Esophageal Candidiasis	43	16	59 (2.4%)
Esophagitis	31	25	56 (2.3%)
Peptic Ulcer	27	20	47 (1.9%)
Duodenitis	20	18	38 (1.6%)
Duodenopathy	15	17	32 (1.3%)

DISCUSSION

In the United States, every year 9% of population develops new onset dyspeptic symptoms but this does not exclude those with pre-existing history of dyspepsia or peptic ulcer disease and hence the onset-rate may be exaggerated⁹. In Scandinavia, an incidence rate of dyspepsia of less than 1% over 3 months has been reported.¹⁰ Dyspepsia continues to be a common illness worldwide. In the United States, the point prevalence is approximately 25%, excluding those people who have typical GERD symptoms.⁷ The prevalence is lower if patients with any symptoms of heartburn and regurgitation are excluded.⁸ This incidence is more poorly documented. Whatever the incidence, the number of subjects who develop dyspepsia is matched by a similar number of subjects who lose their symptoms, explaining the observation that the prevalence remains stable. The diagnostic yield of endoscopy in patients with dyspepsia increases with age. Upper Gastrointestinal endoscopy is a routine procedure in patients with gastrointestinal symptoms. It is performed under local anesthesia with sedation. It is fundamental investigation in diagnosing patients with odynophagia, abdominal pain and

malignancies. Biopsies can easily be taken where necessary; it is considered as ideal for the diagnosis of upper gastrointestinal lesions. In our study the commonest finding were, pangastritis followed by large esophageal varices, GERD, antral gastritis and hiatus hernia which were found in 1581 patients and accounted for about 64.3%. Mahmood K, Saeedi MI, Mohammed R, Din ZU¹¹ has mentioned, duodenal ulcer (8.1%), hiatus hernia (7.2%), duodenitis (7%), gastritis (13.85%), esophagitis (11.1%) and gastric ulcer (3.4%) as the most common findings in upper GI endoscopies. On a broad level in this study there was no significant difference in prevalence of different disease between male and female patients. Various researchers throughout the world and in Pakistan¹²⁻¹⁴ have observed esophagitis as the most frequent lesion during upper gastrointestinal endoscopies. It is obvious that high incidence of esophagitis and gastritis in these patients may be due to infection with H. pylori, use of non-steroidal anti-inflammatory drugs and excessive use of beverages. Peptic ulcer diseases both gastric and duodenal were less common in different studies which may be due to excessive use of proton pump inhibitor in these patients.

CONCLUSION

Upper GI endoscopy is quite important for investigation of patients presented upper abdominal symptoms should be performed to diagnose and differentiate between benign and malignant causes.

Conflict of Interest

The authors confirm that there are no conflicts of interest.

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FREQUENCY OF METABOLIC SYNDROME IN PATIENTS WITH NON-ALCOHOLIC FATTY LIVER DISEASE

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ABSTRACT

Introduction: Nonalcoholic fatty liver disease (NAFLD) is the most common liver disease. NAFLD has two subtypes including simple steatosis and non-alcoholic steatohepatitis (NASH). Once thought to be a benign condition but is now considered to be major cause of liver-related morbidity and mortality. It has been shown that NAFLD is strongly associated to the features of metabolic syndrome (MS). In both conditions (NAFLD and MS) insulin resistance (IR) is a key pathogenic factor.

Objective: To determine the frequency of metabolic syndrome in patients with non-alcoholic fatty liver disease.

Study Design: Cross sectional study.

Setting: Medical Unit III Department of Medicine, Services Hospital, Lahore.

Duration: Six months (22-11-2014 to 22-5-2015).

Methods: A total of 140 patients fulfilling the inclusion were included in the study. Informed consent was taken. The patients were evaluated for MS. Frequency of MS in NAFLD was recorded on a pre-designed proforma.

Results: In our study, 67.86% (n = 95) were between 20 – 50 years of age while 32.14% (n = 45) were between 51 – 70 years of age, mean age \pm SD was 45.87 ± 11.59 years. 58.57% (n = 82) were male while 41.43% (n = 58) were females. Frequency of MS in patients with NAFLD was recorded to be 36.43% (n = 51).

Conclusion: We concluded that NAFLD is an independent risk factor for predicting the risk of MS in our population.

Keywords: Nonalcoholic fatty liver disease, metabolic syndrome, frequency.

INTRODUCTION

Metabolic syndrome (MS) is the co-occurrence of a many of metabolic disorders. The syndrome affects around one in five people worldwide; it could be due to rising prevalence of obesity.¹

MS in South Asia is estimated to be between 20% – 25% while many more may be prone to it.² It is becoming one of the major health issues in developing countries. Prevalence of MS in Pakistan ranges between 18 – 46%.³ MS was found to be highly prevalent in an urban Indian diabetic cohort with greater prevalence in women than men.

Nonalcoholic fatty liver disease (NAFLD) is closely associated with all features of MS. This strongly supports the notion that NAFLD may be the hepatic manifestation of the MS. NAFLD is currently the most common cause of abnormal liver function tests and affects approximately 15-25% of the general

population.^{4,5}

Regarding frequency of MS in patients with NAFLD an eight year old study⁶ recorded it as 22.8%, while in a recent study⁷ conducted in 2012, the frequency was recorded to be 41% which shows a significant variation in both studies.

The rationale of our study was that the above statistics regarding frequency of MS in patients with NAFLD are significantly different which validates the need of further studies to be conducted to confirm these findings. Another significance of the study is that local data is deficient and the results of the current study will be helpful to establish the local magnitude on the issue which will be beneficial for the physicians and population for its early management.

MATERIALS AND METHODS

The study design was cross – sectional. It was

conducted in medical unit III, Department of Medicine, Services Hospital, Lahore. The duration of the study was six months from 22-11-2014 to 22-5-2015 and 140 patients were included in the study. Sampling technique used was non-probability, consecutive sampling.

Inclusion Criteria

- Age: (20 – 70 years).
- Both males and females were included.
- All diagnosed cases of NAFLD for last 2 years (NAFLD was defined as the accumulation of fat more than 5% – 10% of the weight of the liver as evidenced by ultrasonography in cases that drink no alcohol).

Exclusion Criteria

- All cases under treatment of MS.
- Decompensated chronic liver disease (on history and medical record).

DATA COLLECTION

A total of 140 patients fulfilling the inclusion/exclusion criteria presenting through Out-patient department of Medicine, Services Hospital Lahore were included in the study. Informed consent was taken to include their data in the study. Approval from the ethical committee of the hospital was obtained. The patients were evaluated for MS whereby their height (in meters), weight (in kg), systolic blood pressure, fasting blood glucose and triglyceride levels were checked. This was in accordance with the operational definition whereby MS was defined as a patient meeting at least three out of four of the following criteria:

- Body mass index (BMI) ≥ 30;
 - Systolic blood pressure ≥ 140 mmHg or diastolic blood pressure ≥ 90mmHg;
 - Fasting triglyceride ≥ 150 mg/dL, high density lipoprotein cholesterol (HDL-C) < 40 mg/dL in men and < 50 mg/dL in women (all of these);
 - Fasting glucose ≥ 126 mg/dL).
- Frequency of MS in NAFLD was also recorded.

DATA ANALYSIS

Data was entered and analyzed in an SPSS Version 16. Mean ± SD was calculated for age of the patients. Data like gender, and frequency of MS in patients with NAFLD was presented in the form of frequency and percentage. The data was stratified for age and gender of the patients to control the effect modifiers.

RESULTS

A total of 140 cases fulfilling the inclusion criteria were taken in the study to determine the frequency of MS in

patients with NAFLD. Age distribution of the patients was done (Table 1). Patients were distributed according to gender (Table 2). Frequency of MS in patients with NAFLD was recorded (Table 3). Stratification for frequency of MS in patients with NAFLD was done (Table 4). Stratification for frequency of MS in patients with NAFLD according to gender was done (Table 5).

Table 1: Age Distribution (n = 140).

Age (in Years)	No. of Patients	%
20 – 50	95	67.86
51 – 70	45	32.14
Total	140	100
Mean and SD	45.87 ± 11.59	

Table 2: Gender Distribution (n = 140).

Gender	No. of Patients	%
Male	82	58.57
Female	58	41.43
Total	140	100

Table 3: Frequency of Metabolic Syndrome in Patients with Nonalcoholic Fatty Liver Disease (n=140).

Metabolic Syndrome	No. of Patients	%
Yes	51	36.43
No	89	63.57
Total	140	100

Table 4: Stratification for Frequency of Metabolic Syndrome in Patients with Nonalcoholic Fatty Liver Disease with Regards to Age.

Age (in Years)	Metabolic Syndrome		P value
	Yes	No	
20 – 50	35	60	0.88
51 – 70	16	29	

Table 5: Stratification for Frequency of Metabolic Syndrome in Patients with Nonalcoholic Fatty Liver Disease with Regards to Gender.

Gender	Metabolic Syndrome		P value
	Yes	No	
Male	31	51	0.68
Female	20	38	

DISCUSSION

NAFLD is one of the most common liver diseases. NAFLD has two subtypes histologically including simple steatohepatitis and NASH. Once considered to be a benign condition is now increasingly recognized as a major cause of liver-related morbidity and mortality. It has been shown that NAFLD is strongly associated with the features of MS. In both NAFLD and MS Insulin resistance (IR) is a key pathogenic factor.

We planned this research because currently no study was done in our population and the fact that some studies are showing variation regarding frequency of MS in patients with NAFLD.

In our study, 67.86% (n = 95) were between 20 – 50 years of age while 32.14% (n = 45) were between 51 – 70 years of age; mean ± SD was calculated as 45.87 ± 11.59 years, 58.57% (n = 82) were male while 41.43% (n=58) were females.

Frequency of MS in patients with NAFLD was recorded in 36.43% (n = 51).

The findings of our study are in agreement with Margariti E7 and colleagues who evaluated the characteristics of NAFLD patients, focusing on those with normal body mass index (BMI) and recorded that the frequency was metabolic syndrome in NAFLD in 41%. Another study⁶ conducted 8 years before recorded MS in patients with NAFLD as 22.8%.

Moon KW and others⁸ compared the prevalence of MS in simple steatosis with that in NASH and recorded (14/25, 56%) had MS in the NAFLD group. There was no difference in the prevalence of MS between the simple steatosis (5/10, 50%) and the NASH group (9/15, 60%). No difference in histological features was found between NASH with MS and without MS. They concluded that a considerable number of patients with NAFLD had MS. There was a close correlation between NAFLD and MS.

As for the mechanisms of these results, the association between NAFLD and MS could be mainly explained by IR, which was the main mechanism linking NAFLD and MS from pathophysiological perspective.⁹ Many researches demonstrated that IR was a pathogenic factor of the development and progression of NAFLD and also metabolic syndrome.¹⁰ In NAFLD population, excess fat accumulation in the

hepatic parenchyma or overabundance of fatty acids was a major contributor to the development of IR, and further caused MS.¹¹⁻¹² NAFLD commonly manifested to be NASH, which was the result of “two hits” and might result in abnormal lipid metabolism, increased oxidative stress, and accelerated progression of MS.¹³ Moreover, NAFLD involved hepatic lipid peroxidation, which activated inflammatory cytokines, such as interleukin 6, tumor necrosis factor (TNF) and C-reactive protein (CRP),¹⁴ and led to IR, then MS.

The results of our study are helpful to establish the local magnitude on the issue which is beneficial for the physicians and population for its early management.

CONCLUSION

We concluded that NAFLD is an independent risk factor for predicting the risk of MS in our population; hence the patients of this condition should initiate weight and dietary control for prevention of the occurrence of MS.

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PREVALENCE OF GASTRITIS AND GASTROPATHY AMONG UPPER GI ENDOSCOPIES IN PAKISTANI PATIENTS

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ABSTRACT

Objective: To determine the prevalence of different types of gastritides and gastropathies among upper gastrointestinal (GI) endoscopies in Pakistani patients.

Study Design: Retrospective cohort study.

Methodology: In a retrospective analysis of patients who underwent UGIE from July 2010 to June 2014, The gender, history of liver cirrhosis, types of gastritis and gastropathy, mucosal finding in reactive gastropathy, site of erosions in stomach and gastric mucosal findings in patients with bile reflux were the qualitative variables, while age and weight of the patients were the quantitative variables. The entire data was evaluated on SPSS version 25. During descriptive interpretation of data, means and standard deviations were calculated for the presentation of quantitative variable, and frequencies and percentages were computed for qualitative variables.

Results: Out of the total of 3847 patients who underwent UGIE, 60.6% were male and 39.4% were female. The mean age and weights of the patients were 48.35 ± 12.93 years and 71.76 ± 16.13 Kilogram respectively. 64% patients (2463 out of 3847) were suffering from liver cirrhosis, while 90.3% patients (3474 out of 3847) had endoscopic findings suggestive of gastritides and gastropathies. Amongst the patients with findings suggestive for gastritis (n = 1070), 51.9% patients had acute non-erosive gastritis, 37.5% had acute erosive gastritis, 6.4% had nodular gastritis and 4.3% patients have atrophic gastritis. Amongst patients with findings suggestive for gastropathy (n = 2404), majority patients (n = 2375, 98.8%) had portal hypertensive gastropathy (PHG), 1% (n = 25) patients had prolapse gastropathy and only 0.17% (n = 4) patients had hyperplastic gastropathy. Amongst patients with reactive gastropathy, dominant gastric findings suggestive of the diagnosis were erosions (51.6%, n = 207), linear antral reddish streaks (36.2%, n = 145), subepithelial hemorrhages (8.7%, n = 35) and multiple gastric ulcers (3.5%, n = 14). 71 patients had bile reflux in their stomach where dominant mucosal change was linear antral reddish streaks (n = 32), followed by subepithelial hemorrhages (n = 28) and erosions (n = 11).

Conclusion: Gastritis and gastropathy is a prevalent gastric finding among upper GI endoscopies in Pakistani population. Acute non-erosive gastritis is the commonest subtype of gastritis, and PHG is the commonest gastropathy. Erosions, linear antral reddish streaks, subepithelial hemorrhages, and multiple ulcers are the different types of gastric mucosal changes found in reactive gastropathies, while linear antral reddish streaks is the dominant gastric finding in bile reflux gastropathy patients.

Keywords: Gastritis, Gastropathy, Gastric atrophy, Nodular gastritis, Retrospective analysis.

INTRODUCTION

Gastritis and gastropathy affect the mucosa of stomach.¹ Gastropathy can be reactive,² portal hypertensive³ or hyperplastic.⁴ Abnormal gastroscopic findings with normal histology are often due to reactive gastropathy.² Gastritis is a microscopic diagnosis, where inflammatory infiltrates define it. Its incidence is 14% in patients with normal gastroscopic findings;⁵ hence a set of 5 gastric biopsies

must be obtained to diagnose gastritis.⁶

Acute gastritis⁷ is categorized into 2 groups: Acute erosive gastritis i.e. with erosions and acute non-erosive gastritis that is generally caused by helicobacter pylori (Hp), where only mucosal erythema and edema is evident. In addition to Hp, other infective organisms of stomach include CMV, measles, mycobacterium, syphilis and fungi. Severe infectious gastritis with thick edematous mucosa and green black

exudate, known as Phlegmonous gastritis^{8,9} is seen in AIDS, leukemia, massive alcohol or corrosive intake patients. Acute erosive gastritis¹⁰ is also known as reactive gastropathy; where mucosa is damaged by medicine, toxins, bile reflux, stress, radiations, ischemia and prolapse and no significant inflammatory infiltrate is produced. Reddish streaks, subepithelial hemorrhages, erosions, ulcers are the endoscopic findings.

Chronic gastritis¹¹ can be divided into nodular gastritis, atrophic gastritis, granulomatous gastritis, and many more. Mucosal nodularity with cobblestone appearance are the endoscopic findings of nodular gastritis.¹¹ Hpgastritis is the common etiology; however other causes are CD, syphilitic gastritis, lymphocytic gastritis and collagenous gastritis. Pale shiny mucosa with prominent submucosal vessels is suggestive for chronic atrophic gastritis (AG).¹² Findings are distributed in corpus and corpus as well as antrum of stomach in its subtypes (Autoimmune AG, Environmental AG) respectively. The later is most commonly due to Hp gastritis. Narrow distal stomach with thick folds, cobble stone appearance and prepyloric ulcers may be due to granulomatous gastritis.¹³ Microscopically, granulomas are found. Sarcoid, TB and CD should be considered.

Portal hypertension related gastric mucosal changes are of 2 types: Portal hypertensive gastropathy (PHG) and gastric vascular ectasia (GVE).¹⁴ PHG is defined by mosaic-like pattern; where superimposed red spots differentiate severe form from mild one. In GVE, red spots are usually seen without a mosaic background. Hyperplastic gastropathy is characterized by giant gastric folds with epithelial hyperplasia.¹⁵ It can be due to Menetrier's disease or Zollinger Ellison syndrome.

The objective of this study was to elaborate the prevalence of different types of gastritides and gastropathies among upper GI endoscopies in Pakistani patients.

METHODOLOGY

This was a retrospective cohort study carried out at Liver clinic, 250 Shadman Lahore. Amongst the patients who underwent UGIE from July 2010 to June 2014, the patients with endoscopic gastric findings suggestive for different types of gastritis and gastropathy were evaluated.

The mucosal erythema and edema was named as acute non-erosive gastritis (ANG), where erosions, ulcers, sub-epithelial hemorrhages and reddish streaks defined acute erosive gastritis (AEG). In AEG patients, H/O NSAIDs intake, bile staining of gastric mucosa, major physical trauma, radiation exposure, chronic mesenteric insufficiency and gastric cardia prolapse defined NSAIDs-induced gastropathy, bile-reflux gastropathy, stress ulcers, radiation-induced

gastropathy, ischemic gastropathy, and prolapse gastropathy respectively. The term Phlegmonous gastritis was given where thick edematous folds with green black exudates were seen. Inflammation of cardia of stomach just below squamocolumnar junction was named as carditis.

Mucosal nodularity with cobblestone appearance and pale shiny mucosa with prominent submucosal vessels defined the chronic nodular gastritis and chronic atrophic gastritis respectively.

Mosaic-like gastric mucosa pattern in chronic liver disease patient defined PHG; where superimposed red spots differentiated severe subtype from mild form. GVE was also seen as red spots, but usually without a mosaic background in these CLD patients. The giant gastric folds with epithelial hyperplasia gave us the suspicion of hyperplastic gastropathy.

The gender, history of liver cirrhosis, types of gastritis and gastropathy, mucosal finding in reactive gastropathy, site of erosions in stomach and gastric mucosal findings in patients with bile reflux were the qualitative variables, while age and weight of the patients were the quantitative variables. The entire data was evaluated on SPSS version 25. During descriptive interpretation of data, means and standard deviations were calculated for the presentation of quantitative variable, and frequencies and percentages were computed for qualitative variables.

RESULTS

Out of the total of 3847 patients who underwent UGIE, 60.6% (n = 2332) were male and 39.4% (n = 1515) were female. Their mean age was 48.35 ± 12.93 years with a range of 3 to 95 years. The weight ranged from 13 – 131 kilogram, with a mean value of 71.76 ± 16.13 Kilogram. 90.3% patients (3474 out of 3847) had endoscopic findings suggestive of gastritis and gastropathies. Amongst the patients with findings suggestive for gastritis (n = 1070), 51.9% (n = 555) patients had acute non-erosive gastritis, 37.5% (n = 401) patients had reactive gastropathy (acute erosive gastritis), 6.4% (n = 68) patients had nodular gastritis and 4.3% (n = 46) patients have atrophic gastritis. Amongst patients with findings suggestive for gastropathy (n = 2404), majority patients (n = 2375, 98.8%) had portal hypertensive gastropathy (PHG), 1% (n = 25) patients had prolapse gastropathy and only 0.17% (n = 4) patients had hyperplastic gastropathy (Table 1).

Amongst patients with reactive gastropathy, dominant gastric findings suggestive of the diagnosis were erosions (51.6%, n = 207), linear antral reddish streaks (36.2%, n = 145), subepithelial hemorrhages (8.7%, n = 35) and multiple gastric ulcers (3.5%, n = 14) (Picture 1).

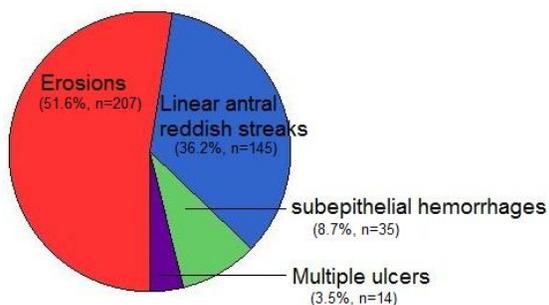
The distribution of erosions in stomach was as follow. Erosions in patients without PHG were

distributed in antrum and prepyloric region (n = 97), fundus (n = 55) and throughout stomach (n = 55) while erosions in addition to PHG were distributed in antrum and prepyloric region (n = 79), fundus (n = 58) and throughout stomach (n = 42) (Table 2).

71 patients had bile reflux in their stomach where

Table 1: Prevalence of gastritis and gastropathy among upper GI endoscopies (n = 3474/3847).

Gastritis/ gastropathy	Frequency (Percent)
Gastritis (30.8%, n=1070)	
1. Acute non-erosive gastritis	555 (51.9%)
2. Reactive gastropathy	401 (37.5%)
3. Nodular gastritis	68 (6.4%)
4. Atrophic gastritis	46 (4.3%)
Gastropathy (69.2%, n = 2404)	
5. Portal Hypertensive gastropathy	2375 (98.8%)
6. Prolapse gastropathy	25 (1.0%)
7. Hyperplastic gastropathy	4 (0.17%)



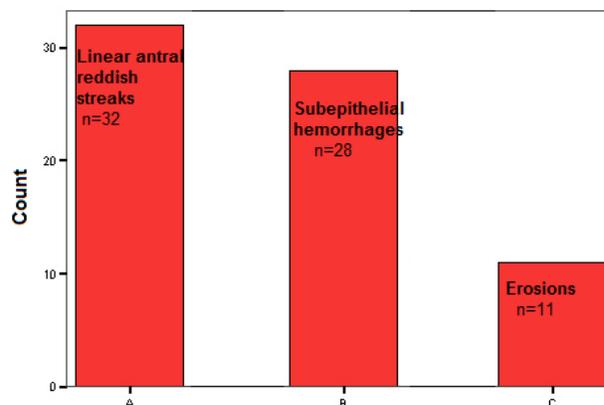
Picture 1: Dominant findings in reactive gastropathy patients (n=401)

Table 2: Distribution of erosions in stomach (n = 386/3847).

A) Without PHG Gastritis (53.6%, n = 207)	
Antrum&prepyloric region	97 (51.9%)
Fundus	55 (37.5%)
Throughout stomach	55 (6.4%)
B) In addition to PHG (46.4%, n = 179)	
Antrum&prepyloric region	79 (98.8%)
Fundus	58 (1.0%)
Throughout stomach	42 (0.17%)

PHG = Portal hypertensive gastropathy

dominant mucoal change was linear antral reddish streaks (n = 32), followed by subepithelial hemorrhages (n = 28) and erosions (n = 11) (Picture 2).



Picture 2: Gastric mucosal findings in patients with bile reflux (n = 71)

DISCUSSION

Today, we are able to classify gastritides into acute and chronic forms depending on endoscopic features. Further, subtypes of gastritides like acute non-erosive gastritis, acute erosive gastritis, Phlegmonous gastritis, nodular gastritis, and atrophic gastritis can be labelled on the basis of physical findings. Similarly, gastropathies can be named PHG, prolapse gastropathy, and hyperplastic gastropathy. The national and even internataional data regarding the frequency of different types of gastritides and gastropathies is scarce. Our study provided first time the whole elaboration about the prevalances of different types of gastritides and gastropathies. Our study also explained the percentage distribution of different types of endoscopic findings in reactive gastropathy patients like erosions, linear antral reddish streaks, subepithelial hemorrhages, and multiple ulcers. Medicines and toxins are the commonest etiology for reactive gastropathy. Bile reflux gastropathy is common after surgery of stomach or gallbladder and even after sphincterotomy. In our data, 71 patients had obvious bile reflux where dominant endoscopic gastric mucosal change was linear antral reddish streaks. Further larger studies are required to validate the association between bile reflux and this mucosal finding.

In a study from Kenya,¹⁶ amongst 1690 patients who underwent UGIE, dyspepsia was the most common symptom for referral (62.7%, n = 1059). In our study, 64% (n = 2463) patients had liver cirrhosis as the referral reason for UGIE. In our study, 30.8% patients had gastritides and 69.2% had gastropathies. In a similar study from Uganda,¹⁷ gastritides were 40.2% diagnoses in patients who underwent UGIE. In 2010, Abbasiet al³ found the frequency of PHG in liver

cirrhosis of 79.27%, while in our study, PHG was seen in 96.4% patients suffering CLD.

All the data favors that the liver disease is the main burden on UGIE suite in our population, where PHG is the commonest gastric finding followed by different types of gastritides.

CONCLUSION

Gastritis and gastropathy is a prevalent gastric finding among upper GI endoscopies in Pakistani population. Acute non-erosive gastritis is the commonest variety of gastritis followed by acute erosive, chronic nodular and chronic atrophic gastritis, while PHG is much more common than other gastropathies like prolapse gastropathy and hyperplastic gastropathy. Erosions, linear antral reddish streaks, subepithelial hemorrhages, and multiple ulcers are the different types of gastric mucosal changes found in reactive gastropathies, while linear antral reddish streaks is the dominant gastric finding in bile reflux gastropathy patients.

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UPPER GI ENDOSCOPIC EVALUATION OF ESOPHAGEAL VARICES: A RETROSPECTIVE ANALYSIS FROM LIVER CLINIC, LAHORE, PAKISTAN

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ABSTRACT

Objective: To evaluate the characteristics of esophageal varices in patients who underwent upper gastrointestinal endoscopy (UGIE) at Liver Clinic, Lahore, Pakistan.

Study Design: Retrospective cohort study.

Methodology: In a retrospective analysis of patients who underwent UGIE from July 2010 to December 2013, gender, disease responsible for portal hypertension and characteristics of esophageal varices were the qualitative variables, while age and weight of the patients were the quantitative variables. The data was evaluated on SPSS version 15, where means and standard deviations were calculated for the presentation of quantitative variable, and frequencies and percentages were computed for qualitative variables.

Results: Out of the total of 3255 patients who underwent UGIE, 2097 (64.4%) had clinical evidence of portal hypertension (PHT) and 1837 (56.4%) had esophageal varices (EV). The mean age of the patients with PHT was 51.03 ± 10.20 years, the mean weight was 72.55 ± 15.83 Kilogram, and the main gender was male (63.6%, $n = 1334$). The grades of EV were as follow: grade I (38.3%, $n = 704$), grade II EV (23.4%, $n = 430$), and grade III EV (38.3%, $n = 703$). The EV were actively bleeding in 1.9% ($n = 35$) patients, and had red color signs in 18.4% ($n = 338$) patients. Amongst different red color signs, percentage distribution was as follow: Red wale markings (20.4%, $n = 69$), Cherry-red spots (29.9%, $n = 101$), Hematocystic spots (42%, $n = 142$), and Diffuse redness (1.7%, $n = 26$). Majority of EV were located in distal esophagus, while a very few patients had varices high up in esophagus as well. 6.2% ($n = 114$) patients with EV had gastroesophageal varices (GOV) as well. Amongst 114 patients with GOV, 57%

($n = 65$) had GOV 1, while 43% ($n = 49$) had GOV 2. Majority GOV (73.7%, $n = 84$) were associated with grade III EV. Additional esophageal findings include lax or widely opened LES (1.1%, $n = 20$), hiatal hernia (4.6%, $n = 84$), reflux esophagitis (2.6%, $n = 48$), esophageal candidiasis (0.5%, $n = 9$), post-band ligation stricture (0.3%, $n = 5$) and schatzki's ring (0.1%, $n = 2$). 1081 patients with EV received endoscopic variceal band ligation (EVBL) while one patient with actively bleeding small esophageal varices received injection sclerotherapy with absolute alcohol.

Conclusion: Esophageal varices are a common finding during UGIE in patients with portal hypertension, especially having liver cirrhosis. They have many characteristics like size, shape, grade, red color signs, location, and extension into stomach, which should be reported for their better management. Esophageal findings suggestive for GERD like hiatal hernia and reflux esophagitis are commonly seen in addition to EV in these patients.

Keywords: Esophageal varices, Red color sign, Retrospective analysis.

INTRODUCTION

Esophageal varices are dilated submucosal veins secondary to portal hypertension,¹ which are mostly detected during upper gastrointestinal endoscopy (UGIE).² Color, shape, location, and red color sign are the different notable characteristics of the esophageal

varices.³ The color of the varices may be white or blue.⁴ Their shape can be straight, tortuous or coiled. These can be located in the lower, middle or upper esophagus; however mostly are found distally.¹ Esophageal varices (EV) may have red color sign (RCS),⁵ which make them prone to bleed. Among these

signs, longitudinal whip like marks are known as red wale markings (RWM). Red spots < 3mm in diameter are called cherry-red spots, while blood filled blisters > 4mm in diameter are named as hematocystic spots. Sometimes, varices are diffusely red. EV can be graded from I to III.⁶ Grade I EV are small and straight, grade II EV are tortuous and occupy < 1/3 of the esophageal lumen, while grade III are those large ones who occupy > 1/3 of the esophageal lumen. According to recent guidelines,⁷ varices have 2 grades (small and large) with a cut-off size of 5 mm, a size of an open biopsy forceps. Therefore, grade II and III are large band-able varices. Sometimes, EV also extend to stomach and are called Gastroesophageal varices (GOV). Sarin's classification⁸ named GOV 1 to EV extending along lesser curvature and GOV 2 to EV extending along greater curvature of the stomach. Similarly isolated gastric varices (IGV) were divided into IGV 1 and IGV 2, depending on their gastric location in the fundus and other than fundus, respectively.

The objective of this study was to describe all the characteristics of esophageal varices and associated findings which have impact on their management as well, in those patients who underwent UGIE at Liver clinic, Lahore, Pakistan.

METHODOLOGY

This was a retrospective cohort study carried out at Liver clinic, 250 Shadman Lahore. Amongst the patients who underwent UGIE from July 2010 to December 2013, the patients with clinical features suggestive for portal hypertension like liver cirrhosis, non-cirrhotic portal hypertension⁹ and Budd-Chiari syndrome¹⁰ were evaluated. EV were graded from I to III as follow: small and straight EV were Grade I, EV, tortuous varices occupying < 1/3 of the esophageal lumen were grade II, and larger occupying > 1/3 of the esophageal lumen were grade III EV. The red color signs like red wale markings, cherry-red spots, hematocystic spots, and diffuse redness, as well as shape and location of esophageal varices were also noted. The EV with their extension in the stomach was named as GOV. Those extending along lesser curvature of stomach were GOV 1, and those extending along greater curvature were GOV 2. Additional findings like Lax LES, hiatal hernia, reflux esophagitis, post-band ligation stricture, esophageal candidiasis etc. were also noted. The gender, disease responsible for portal hypertension and characteristics of esophageal varices were the qualitative variables, while age and weight of the patients were the quantitative variables. The entire data was evaluated on SPSS version 15. During descriptive interpretation of data, means and standard deviations were calculated for the presentation of quantitative variable, and frequencies

and percentages were computed for qualitative variables.

RESULTS

A total of 3255 patients underwent UGIE, out of which 2097 (64.42%) presented with clinical picture suggestive for portal hypertension. 2089 patients had liver cirrhosis, 6 had non-cirrhotic portal hypertension, and 2 had Budd Chiari syndrome. The mean age amongst these studied 2097 patients was 51.03 ± 10.20 years with a range of 12 to 95 years. The weight ranged from 27 – 131 kilogram, with a mean value of 72.55 ± 15.83 Kilogram. 1334 patients (63.6%) were male and 763 patients (36.4%) were female.

Table 1: Characteristics of Esophageal varices (n = 1837/2097).

Characteristics	Frequency (Percent)
Grade of Esophageal varices	
Grade I	704 (38.4%)
Grade II	430 (23.4%)
Grade III	704 (38.3%)
Red color signs	
Red wale markings	69 (3.8%)
Cherry-red spots	101 (5.5%)
Hematocystic spots	142 (7.7%)
Diffuse redness	26 (1.4%)
Active bleeding from EV	
Yes	35 (1.9%)
No	1802 (98.1%)
Type of associated GOV	
GOV 1	65 (3.5%)
GOV2	49 (2.7%)
Additional esophageal findings	
Lax or widely opened LES	20 (1.1%)
Hiatal hernia	84 (4.6%)
Reflux esophagitis	48 (2.6%)
Candidiasis	9 (0.5%)
Stricture, post band ligation	5 (0.3%)
Schatzki's ring	2 (0.1%)

GOV = Gastroesophageal varices; EV = Esophageal varices; LES = Lower esophageal stricture

12.4% patients (260 out of 2097) had no esophageal varices, while 87.6% (1837 out of 2097) had esophageal varices. Amongst these last 1837 patients, 38.3% (n = 704) had grade I EV, 23.4% (n = 430) had grade II EV, while 38.3% (n = 703) had grade III EV. The EV were actively bleeding in 1.9% (n = 35) patients, and had red color signs in 18.4% (n = 338) patients. Amongst different red color signs, percentage distribution was as follow: Red wale

markings (20.4%, n = 69), Cherry-red spots (29.9%, n = 101), Hematocystic spots (42%, n = 142), and Diffuse redness (1.7%, n = 26). Majority EV were located in distal esophagus, while a very few patients had varices high up in esophagus as well. The shape of the varices was small straight in 704 patients, tortuous in 430 patients and large coil shaped in 703 patients. 6.2% (n = 114) with EV had gastroesophageal varices (GOV) as well. Amongst 114 patients with GOV, 57% (n = 65) had GOV 1, while 43% (n = 49) had GOV 2. Majority GOV (73.7%, n = 84) were associated with grade III EV.

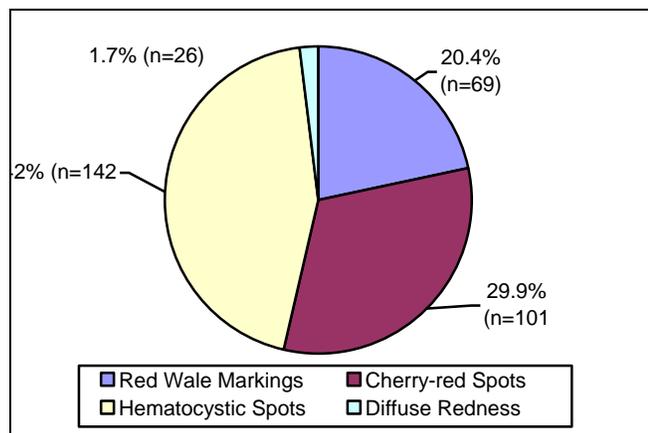


Fig. 1: Red Color Signs on Esophageal Varices.

Amongst other findings noted in esophagus, in addition to varices, features consistent with GERD were more common. 20 patients had lax or widely opened LES, 84 had hiatal hernia and 48 patients had reflux esophagitis. Other findings include esophageal candidiasis in 9 patients, post-band ligation stricture in 5 patients and schatzki's ring in 2 patients. The therapeutic maneuvers offered to esophageal varices were as follow: 1081 patients received endoscopic variceal band ligation (EVBL) while one patient with actively bleeding small esophageal varices received injection sclerotherapy with absolute alcohol. For GOV 2 and IGV, injection sclerotherapy using cyanoacrylate glue was performed in all those patients where indicated.

DISCUSSION

Our country Pakistan has a lot of cirrhotic patients who are offered UGIE in hospitals even at district level. This UGIE is offered once diagnosis of cirrhosis is made. It is repeated after every 2 – 3 years if no varices and every 1-2 years if small varices are found.^{11,12} Primary prophylaxis using non-selective beta blockers (NSBB) is offered to high risk small EV (with red sign or in Child Turcotte Pugh class C [CTP-C] patient), while primary prophylaxis for large EV is achieved using NSBB or endoscopic variceal band

ligation (EVBL). To prevent rebleeding, NSBB should be combined with EVBL. For GOV 1, rules for EV are followed, while for rest gastric varices, primary prophylaxis is achieved using NSBB. To prevent rebleeding, transjugular intrahepatic portosystemic shunt (TIPS) or balloon-occluded retrograde transvenous obliteration (BRTO) is the first line treatment. Cyanoacrylate glue injection is an option if TIPS or BRTO are not technically feasible.³ International data suggests that varices are present in approximately 50% of patients with cirrhosis; 30% prevalence in compensated & upto 85% in decompensated cirrhosis patients.^{13,14} Our data showed that 87.6% (1837 out of 2097) patients with clinical evidence for portal hypertension had esophageal varices. Among these patients 99.6% had liver cirrhosis. This difference may point the late gastroenterologist consultation at advanced disease stage in our people.

The characteristics of esophageal varices should be noted during UGIE as these have role in making the decision for the therapy.¹⁵ Literature tells about the high risk for variceal hemorrhage if EV have red color signs.¹⁶ All 4 types of red color signs were found in our pool of the patients. Akere et al. from Nigeria reported the prevalence of red color signs 28.6% with RWM being most common one.¹⁷ In our study, RCS was observed in 18.4% (n = 338) patients and the commonest RCS was hematocystic spots. Jahanzeb et al observed grade III EV as the commonest among all grades (77%),¹⁸ where as in our data all three grades were found nearly in equal proportion. In a study from Taiwan, liver cirrhosis was proved to be a predisposing factor for esophageal candidiasis (EC), where incidence of EC in cirrhotic and non-cirrhotic patients was 0.8% and 0.36% respectively.¹⁹ However, our study the prevalence was 0.5% Schechtes RB et al mentioned 37% prevalence of GERD in patients with liver cirrhosis and esophageal varices.²⁰ Similarly, a large study from China of 1280 patients showed 36.4% prevalence of RE determined by UGIE in patients with liver cirrhosis.²¹ In our study, only 4.6% patients had hiatal hernia and 2.6% had RE. This low prevalence of GERD predictive findings may be due to vigorous use and easy availability of proton pump inhibitors (PPIs) in our population. Further large studies are required to validate these findings.

CONCLUSION

Esophageal varices are a common finding during UGIE in patients with portal hypertension, especially having liver cirrhosis. A variety of the characteristics of esophageal varices like their size, shape, grade, red color signs, location, extension into stomach are always found and have to be reported for better management. Esophageal findings suggestive for

GERD like hiatal hernia and reflux esophagitis are commonly seen in addition to EV in these patients.

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THE DIAGNOSTIC ACCURACY OF RAISED SERUM AMYLASE LEVEL AT 4 HOURS POST ERCP IN PREDICTING ACUTE PANCREATITIS

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ABSTRACT

Introduction: Post-ERCP pancreatitis is a common complication of endoscopic retrograde cholangiopancreatography (ERCP). A simple method of predicting patients who are at risk of developing post-ERCP pancreatitis is needed to allow those at low risk to be discharged on the same day of their procedure. One such simple practical test to be used is a 4 hour post-ERCP amylase level.

Objective: To determine the diagnostic accuracy of raised serum amylase level at 4 hours post ERCP for detecting acute pancreatitis taking CT scan as gold standard.

Study Design: Cross sectional study.

Setting: Medical Unit III Department of Medicine, Services Hospital, Lahore.

Duration: Six months (7th August 2015 to 6th February 2016).

Methods: 255 patients were enrolled, from inpatient department of Medicine, Services Hospital, Lahore, who had ERCP within 4 hours interval. Venous sample of blood was sent in laboratory for evaluation of serum amylase levels at 4 hours after ERCP. After 24 hours, CT abdomen was done for detection of acute pancreatitis. The patients in whom pancreatitis was found were retained and treated accordingly and the rest were discharged. Diagnostic accuracy of raised serum amylase at 4 hours in predicting acute pancreatitis taking CT scan as gold standard was calculated.

Results: A total of 255 patients were included in the study. The mean age of patients was 42.40 years with standard deviation of 2.78 years. Most of the patients were in the age range of 40 – 50 years. Majority of the patients in the study were females (58.8%). A total of 24 patients (9.41%) included in the study developed pancreatitis as determined by CT scan whereas 69 (27.05%) patients were reported positive using raised serum amylase. Sensitivity, specificity, positive predictive value and negative predictive were 75%, 77.92%, 26.08%, 96.77% respectively.

Conclusion: The study showed that 4-hour amylase level is a useful measure in the prediction of post-ERCP pancreatitis.

Keywords: Acute Pancreatitis, Amylase, ERCP.

INTRODUCTION

Although magnetic resonance cholangiopancreatography (MRCP) provides similar images as endoscopic retrograde cholangiopancreatography (ERCP) for the diagnosis of pancreatico-biliary diseases,¹ it still cannot completely replace ERCP in those patients who also require tissue sampling and therapeutic interventions¹. Manipulation of the ampulla of Vater is associated with serum pancreatic enzyme elevations in up to 70% of cases.²

Acute pancreatitis is the most common and feared complication of ERCP that can cause significant morbidity and mortality³. The frequency of post-ERCP pancreatitis (PEP) is between 1.3% and 7.6% in

prospective studies⁴. This range likely reflects differences in definitions of pancreatitis and methods of data collection. By using this and similar definitions, the incidence of PEP in a meta-analysis of 21 prospective studies was approximately 7.6% but it ranges widely 1.6% - 15.7%.⁴

The mechanisms that lead to the formation of PEP are complex and not yet fully understood. Mechanical damage as a result of difficult cannulation of common bile duct, hydrostatic damage as a result of excessive contrast injection to pancreatic duct, allergic or chemical injury at the pancreas secondary to ionic contrast, enzymatic damage as a result of activation of intestinal enzyme content, damage secondary to the

bacterial contamination of endoscopes and accessories has been suggested.⁵

One of the more practical tests to emerge is post-ERCP amylase level. Although hyperamylasemia is a common and often a benign phenomenon after ERCP, it has been shown consistently to be associated with post-ERCP pancreatitis.⁶ In a study by Sutton VR, et al⁷ the sensitivity and specificity of raised serum amylase level (> 150 IU/L) at 4 hours was 90% and 69.7% (taking CT scan of pancreas as gold standard).

The rationale of this study was to determine diagnostic accuracy of 4 hours raised serum amylase level for detection of post ERCP acute pancreatitis as early detection of acute pancreatitis would help in identifying the patients who would develop pancreatitis and consequently need early management.

MATERIALS AND METHODS

The study design was cross – sectional. It was conducted in medical unit III, Department of Medicine, Services Hospital, Lahore. The duration of the study was six months from 7th August 2015 to 6th February 2016. 255 patients were included using 95% confidence level with an expected percentage of sensitivity as 90%⁶ with 8% margin of error, specificity 69%⁶ with 7% margin of error taking an expected percentage of acute pancreatitis as 15.7%.⁴

Inclusion Criteria

1. All the patients who have had ERCP 4 hours before.
2. Both male and female patients were included.
3. Patients from 20 to 50 years of age were included.

Exclusion Criteria

1. Patients with previous history of gall bladder or pancreatic surgery.
2. Patients with previous episodes of pancreatitis (raised serum amylase).
3. Patients with pancreatic or liver malignancy.
4. Patients with bowel malignancy.

Data Collection Procedures

255 patients fulfilling the inclusion criteria were enrolled from in patient department of Medicine, Services Hospital, Lahore. The demographic data i.e. age and sex was noted. A detailed history was taken. An informed consent was taken from all patients. Venous sample of blood were sent in laboratory for evaluation of serum amylase levels at 4 hours after ERCP. A raised level of serum amylase was labeled as positive or negative. After 24 hours, CT scan (gold standard) was done for detection of acute pancreatitis. The patients were labeled as positive or negative. The patients in whom pancreatitis was found were admitted and treated accordingly. Patients in whom, pancreatitis was not be detected were discharged.

Statistical Analysis

Statistical analysis was done using SPSS16. Numeric variables like age were described as mean and standard deviation. The qualitative variables like sex, pancreatitis on CT scan and amylase were described as frequency and percentage. Diagnostic accuracy, sensitivity, specificity, positive predictive value and negative predictive value were calculated by generating 2 × 2 contingency tables. P < 0.05 was regarded as statistically significant.

Raised 4 hours serum amylase level	CT scan of the Pancreas	
	Positive	Negative
Positive (> 150IU/L)	TP	FP
Negative (< 150IU/L)	FN	TN

(TP true positive, FP true negative, FN false negative, TN true negative)

RESULTS

A total of 255 patients were included in the study. The mean age of patients was 42.40 years with standard deviation of 2.78 years with most of the patients in the age range 40 – 50 years. Age distribution of the patients is given in Table 1. Majority of the patients in the study were females (58.8%). Gender distribution is outlined in Table 2.

Table 1: Age Distribution.

Age (in Years)	No. of Patients	%
20 – 30	43	16.86
31 – 40	62	24.31
41 – 50	150	58.82
Total	255	100

Table 2: Gender Distribution.

Gender	No. of patients	%
Male	100	39.22
Female	155	60.78
Total	255	100.0

A total of 24 patients (9.41%) out the 255 patients included in the study developed pancreatitis as determined by gold standard CT scan whereas 69 (27.05%) patients were reported positive using raised serum amylase (Table 3 and 4).

Diagnostic accuracy was then calculated in terms of sensitivity, specificity, positive predictive value and

negative predictive value using 2x2 table presented as table 5. Sensitivity, specificity, positive predictive value and negative predictive were 75%, 77.92%, 26.08%, 96.77% respectively.

Table 3: Acute Pancreatitis on CT Abdomen.

Acute Pancreatitis	No. of Patients	%
Yes	24	9.41
No	231	90.59
Total	255	100.0

Table 4: Acute Pancreatitis as per Raised Serum Amylase.

Acute Pancreatitis	No. of Patients	%
Yes	69	27.05
No	186	72.94
Total	255	100.0

Table 5: Diagnostic Accuracy of Raised Serum Amylase at 4 Hours with CT as Gold Standard.

Raised 4 Hours Serum Amylase Level	CT Scan of the Pancreas	
	Positive	Negative
Positive (> 150 IU/L)	18	51
Negative (< 150 IU/L)	6	180

Sensitivity: True Positive/True Positive + False Negative = 18/24 = 75%

Specificity: True Negative/True Negative+False Positive = 180/231 = 77.92%

Positive Predictive Value: True Positive/True Positive + False Positive = 18/69 = 26.08%

Negative Predictive Value: True Negative/True Negative + False Negative = 180/186 = 96.77%

DISCUSSION

This study demonstrates that hyperamylasemia 4 hours post-ERCP is associated with post-ERCP pancreatitis, and therefore can be used to predict this complication. This is in accordance with some studies done earlier.¹⁻¹⁰

Table 6: Stratification of Diagnostic Accuracy of Serum Amylase with CT W.R.T Age.

Age (Years)	Pancreatitis on CT Scan	Pancreatitis on Raised Serum Amylase		Sensitivity	Specificity	Positive Predictive Value	Negative Predictive Value	P value
		Positive	Negative					
20 – 30	Positive	3	1	75.0%	82.0%	30.0%	97.0%	0.06
	Negative	7	32					
	Total	10	33					
31 – 40	Positive	4	2	66.7%	63.2%	22.2%	92.3%	0.35
	Negative	14	24					
	Total	18	44					
41 – 50	Positive	11	3	78.6%	68.4%	26.8%	95.6%	0.02
	Negative	30	65					
	Total	41	109					

Table 7: Stratification of Diagnostic Accuracy of Serum Amylase with Ct W.R.T Gender.

Gender	Pancreatitis on CT Scan	Pancreatitis on Raised Serum Amylase		Sensitivity	Specificity	Positive Predictive Value	Negative Predictive Value	P value
		Positive	Negative					
Male	Positive	7	3	70.0%	74.4%	23.3%	95.7%	0.01
	Negative	23	67					
	Total	30	70					
Female	Positive	10	4	71.4%	78.8%	25.6%	96.4%	0.01
	Negative	29	108					
	Total	39	112					

Table 8: Stratification of Diagnostic Accuracy of Serum Amylase with CT W.R.T Baseline Serum Amylase.

Baseline Serum Amylase	Pancreatitis on CT Scan	Pancreatitis on Raised Serum Amylase		Sensitivity	Specificity	Positive Predictive Value	Negative Predictive Value	P value
		Positive	Negative					
< 75 IU/L	Positive	7	4	63.6%	78.4%	21.9%	95.8%	0.01
	Negative	25	91					
	Total	32	95					
75 – 150 IU/L	Positive	8	5	61.5%	74.8%	21.6%	94.5%	0.01
	Negative	29	86					
	Total	37	91					

Testoni et al. measured 2, 4, 8 and 24 – hour amylase level in 409 patients, and found that over two thirds of their patients who were diagnosed with post-ERCP pancreatitis had a 4 – hour amylase level, similar to our results⁵. This appears to be at odds with Ito et al., who found that post-ERCP pancreatitis is frequently associated with a 3-hour amylase that becomes more elevated at 6 hours⁸. They concluded that the 4-hour amylase level minimizes the likelihood of underestimating the risk of post-ERCP pancreatitis.

Fernandez-del Castillo studied the combination of 2 – hour amylase, lipase and clinical assessment to predict post-ERCP pancreatitis.¹⁰ They developed an algorithm allowing the discharge of patients. Unlike amylase levels, the effect of ERCP on lipase levels remains largely unknown. Lipase usually rises later than amylase in pancreatitis and may therefore not be as useful in the early prediction of post-ERCP pancreatitis. Similar observations were made by George S, Kulkarni AA, Stevens G.¹¹

Loperfido S, Angelini G, Benedetti GK, Apetanos et al. studied amylase levels 2 and 6 hours post-ERCP in 97 patients.¹³ They found that raised amylase at

either 2 or 6 hours could both predict post-ERCP pancreatitis with the same accuracy. This gave a 26% risk of post-ERCP pancreatitis compared with 9% if the 6 – hour amylase was decreased. This 6-hour time frame may be impractical for use in determining same-day discharges. Although many studies have focused on determining the most appropriate timing for the post-ERCP amylase level, the 4 – hour level appears to have the most support. Post-ERCP amylase has been shown to peak at 90 minutes to 4 hours.¹⁴

In a study comparing contrast media in 1,972 patients, Cotton PB, Garrow DA, Gallagher J, Romagnuolo J. found that an increased number of pancreatic duct injections resulted in a progressively higher incidence of post-ERCP pancreatitis.²³ It has also been shown that technical factors related to pancreatogram, such as difficult cannulation or pancreatic sphincterotomy convey additional risk of post-ERCP pancreatitis.^{22,24} Other predictors of post-ERCP pancreatitis have also been studied in various studies, including urine amylase²⁵, urinary trypsinogen activation peptides,²⁶ and trypsinogen-2.²⁶ These tests have so far proven to be unhelpful in

predicting post-ERCP pancreatitis. Similarly, CRP has been shown to be a late marker for post-ERCP pancreatitis, and again, unhelpful in early decision-making.

An ideal test for predicting post-ERCP pancreatitis would detect the majority of patients with severe episodes, and would be performed in a timely manner to facilitate same-day discharge. From our results, we propose that patients undergoing ERCP be treated if amylase levels are elevated at 4 hours. Nevertheless, if there are other clinical concerns, or if the patient's social circumstances make a same-day discharge inadvisable, admission may still be necessary in patients with a normal amylase level. Future research is warranted on these matters.

CONCLUSION

The 4 – hour amylase level is a useful measure in the prediction of post-ERCP pancreatitis. Patients who have undergone ERCP should be admitted if 4-hour amylase level is raised. Further studies are warranted, but it is recommended that awareness be increased and quality improvement measures may be considered to expedite management of acute pancreatitis.

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