The Burden of Gastrointestinal, Hepatobiliary and Pancreas Related Diseases and Their Causes at Tertiary Care Hospital in Karachi

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ABSTRACT

Objective: To determine the burden of gastrointestinal, hepatobiliary and pancreas-related disease, frequencies and their presentations.

Study Design: Cross-sectional study.

Place and Duration of Study: Gastroenterology Department, Liaquat National Hospital, Karachi from Oct 2020 to Jul 2021

Methodology: Patients aged ≥18 years, having diagnosis related to gastrointestinal, hepatobiliary and pancreas were included in the study. Demographic features, reasons for admission, and length of stay were recorded.

Results: A total of 2183 patients were enrolled. Nearly half of the patients were ≥60 years. 43% of patients were presented with abdominal pain. The most frequent diagnosis includes decompensated chronic liver disease followed by upper gastrointestinal bleed. The proportion of female patients was significantly higher for gastritis (p=0.009) and acute cholecystitis (p=0.036), while males with Hepatitis-B (p=0.019) and liver abscesses (p=0.018) were significant. Admissions through emergency were higher for gastrointestinal bleeding and decompensated chronic liver disease (p<0.001) in monitoring setup (p=0.034), ward admission via OPD were significant for upper gastrointestinal malignancy (p=0.011) and hepatocellular carcinoma (p=0.038). Extended length of stay and expiry was significant among acute liver failure (p=0.047) and gastric outlet obstruction (p=0.030).

Conclusion: Notably, highly evitable diseases are still a foremost reason of clinical importance, lack of awareness and low cure rate, especially in rural areas progress to high fatality as most patients do not seek medical assistance until significant manifestation. This appeals to more effective measures, including eradicating the potentially life-threatening disease.

Keywords: Disease burden, Disease pattern, Disease trend, Gastrointestinal, Hepatobiliary, Liver, Pancreas.

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INTRODUCTION

Gastrointestinal (GI), hepatobiliary and pancreas-related diseases are globally widespread, affecting millions and are the chief source of hospitalization with the third leading seed of death in the UK after cardiopulmonary disease.[1,2] It works out for basic health care implementation and employment, providing a detailed report of the disease disburse across GI in the US.[3] Hepatological diseases, including viral hepatitis, includes hepatitis C (HCV), hepatitis B (HBV) infections, non-alcoholic fatty liver disease (NAFLD), alcoholic liver disease (ALD), and associated cirrhosis, Acute liver failure (ALF), Acute on chronic liver failure (ACLF) and hepatocellular carcinoma (HCC), are major causes of ailment and death universally.[4] Apart from mortality, peptic ulcer disease (PUD), irritable bowel syndrome (IBS), gastroesophageal reflux disease (GERD), non-alcoholic steatohepatitis, HBV, gall stone disease, and non-ulcer dyspepsia are the most common gastrointestinal and liver disease (GILD) outpatient diagnoses.[5] Such diseases evolve patients' quality of life and fecundity.[6] Literature has related enteric infection with an increased risk for chronic GI disorders, including gastroesophageal reflux disease (GERD), irritable bowel syndrome (IBS) and non-GI maladies such as chronic fatigue syndrome (CFS).[7] IBS is a functional GI condition diagnosed by gastroenterologists and a major reason for consulting physicians.[8]

Regardless of treatment modification, the worldwide burden of GILD is poised to inflate due to health revamp factors such as prolongation of life expectancy, augmentation of sedentary routines and over-nutrition.[9] GILD requires increasingly specialized training expressways, including advancements in therapeutic endoscopy, Luminal disease and Hepatology for better patient results.[10]

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The aim of the study was to determine the most common GILD conditions responsible for frequent admissions or consultations, as it affects the majority worldwide. So attempt to summarize and highlight the major findings, identifying high-risk populations, as knowledge of the patterns is useful to prioritize health and plan for preventive measures, thus reducing their occurrence among the population.

METHODOLOGY

This cross-sectional study was carried out at the Department of Gastroenterology, Liaquat National Hospital, Karachi from October 2020 to July 2021 after acquiring approval from Hospital Ethics & Research Committee (certificate number 0597-2020 LNH-ERC). The sample size was calculated using an OpenEpi sample size calculator with the prevalence of HBV at 35.9%.[11] Non-probability consecutive sampling technique was used.

Inclusion Criteria: Patients of both gender with symptoms related to GI, hepatobiliary and pancreas related, aged ≥18 years and agreed to undergo advised investigations were enrolled.

Exclusion Criteria: Patients who were admitted with issues other than GILD, unwilling to be part of the study or/and refused informed consent were excluded from the study.

After explaining the study purpose and obtaining informed consent, a pre-designed structured proforma was used to record study variables. Patients' confidentiality and the medical record were maintained. Only principal investigators have access to original data.

For patients admitted to the gastroenterology ward, thorough history and clinical examination were documented, including demographic features, reasons for admission, length of stay in the hospital, and causes.

Statistical Package for Social Sciences (SPSS) version 23.0 was used for the data analysis. Quantitative variables were summarized as mean ± SD and qualitative variables were summarized as frequency and percentages. Chi-square test was applied to find out the association. The *p*-value lower than or up to 0.05 was considered as significant.

RESULT

Total 2183 patients' were enrolled into the study. Table-I displayed the participants' characteristics. Nearly half of the patients were ≥60 years (n=1119, 51.3%) whereas remaining were 31-59 years (n=967, 44.3%) and 18-30 years (n=97, 4.4%).

Table-I: Frequency of patients' demographic and clinical features.

Variables	n (%)
Age (years)#	61 (53-69)
LOS (days)#	6 (4 - 9)
Gender	
Male	1276 (58.6)
Female	907 (41.5)
Education	
Illiterate	145 (6.6)
Primary	630 (28.9)
Matric	1130 (51.8)
Undergraduate	183 (8.4)
Graduate	95 (4.4)
Marital status	
Married	1663 (76.2)
Unmarried	520 (23.8)
Admitting ward	
Ward	1892 (86.7)
HDU	248 (11.4)
ICU	43 (2)
Admission Mode	
ER	707 (32.4)
OPD	1476 (67.6)
Outcomes	
Discharged	2037 (98)
Expired	42 (2)
Left-against-medical-advise	104 (4.8)

#: *variables are presented as median (first quartile–third quartile)*

Excluding the patients who left against medical advice, more than half of the patients stayed in hospital at most for a week (n=1397, 67.2%). Most common presented symptom was abdominal pain (n=939, 43%) followed by jaundice (n=191, 8.7%), epigastric pain (n=166, 7.6%), abdominal distension (n=162, 7.4%), hematemesis (n=123, 5.6%), fever (n=109, 5%), bleeding per rectum (n=96, 4.4%), diarrhea (91, 4.2%), vomiting (89, 4.1%), melena (72, 3.3%), dysphagia (n=70, 3.2%), drowsiness (n=41, 1.9%), constipation (n=32, 1.5%) and weight loss (n=2, 0.1%). Frequency of diagnosis was depicted in the Figure.

Table-II demonstrated demographics among diseases. Frequency of female patients was higher for gastritis (p=0.009), acute pancreatitis (p=0.010). Whereas proportions of males with HBV (p=0.019) and liver abscess (0.018) was significant.

Table-III presented the clinical characteristics of different diseases. Admissions through Emergency were significantly higher for GI-bleed (p<0.001) and CLD (p<0.001) in the monitoring setup, whereas GI malignancy (p<0.001) and metastatic diseases (p<0.001) were more likely to admit through OPD inward.

Length of stay and expiry was significant among patients with DILI (p=0.047), leading to ALF (p=0.025) and gastric outlet obstruction (p=0.030)

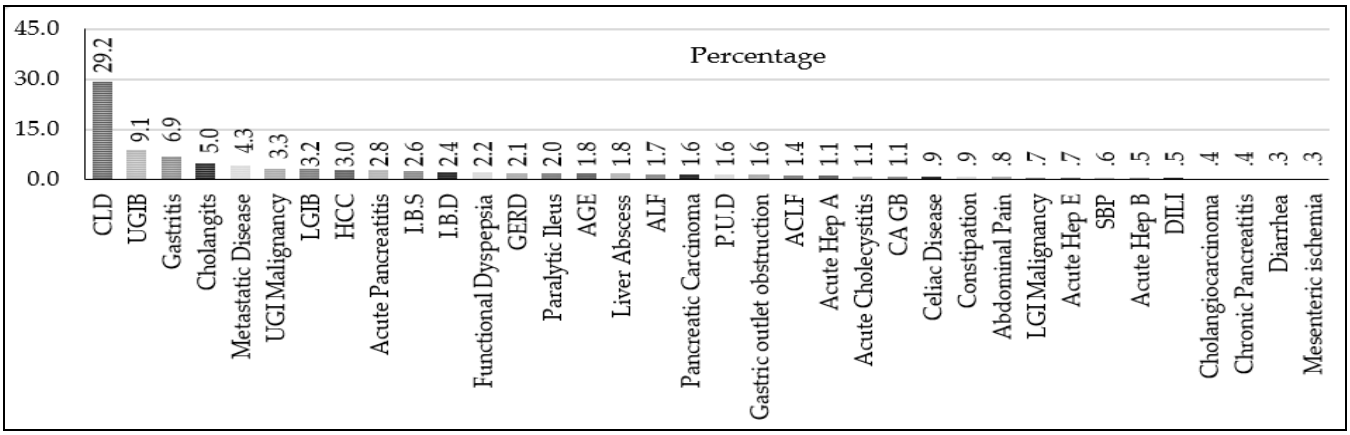

Figure: Frequency of diagnosis.

Table-II: Comparison of patients' demographics among different diagnosis.

Diagnosis	Age (In Years)				Gender		
	18-30	31-59	≥60	p-value	Male	Female	p-value
Upper GI-bleed	5 (5.2)	96 (9.9)	97 (8.7)	0.929	126 (9.9)	72 (7.9)	0.121
Lower GI-bleed	4 (4.1)	27 (2.8)	38 (3.4)	0.721	43 (3.4)	26 (2.9)	0.508
Functional dyspepsia	5 (5.2)	27 (2.8)	17 (1.5)	**0.007	24 (1.9)	25 (2.8)	0.174
Gastritis	18 (18.6)	69 (7.1)	64 (5.7)	**<0.001	73 (5.7)	78 (8.6)	**0.009
Gastro-esophageal-reflux-disease	2 (2.1)	23 (2.4)	22 (2)	0.611	24 (1.9)	23 (2.50	0.299
Upper GI-malignancy	3 (3.1)	32 (3.3)	36 (3.2)	0.960	34 (2.7)	37 (4.1)	0.066
Lower GI-malignancy	0 (0)	9 (0.9)	7 (0.6)	0.832	11 (0.9)	5 (0.6)	0.401
Chronic liver disease	8 (8.2)	274 (28.3)	356 (31.8)	**<0.001	388 (30.4)	250 (27.6)	0.150
Acute liver failure	3 (3.1)	17 (1.8)	17 (1.5)	0.343	22 (1.7)	15 (1.7)	0.900
Acute Hepatitis-A	2 (2.1)	14 (1.4)	10 (0.9)	0.157	20 (1.6)	6 (0.7)	0.055
Acute pancreatitis	3 (3.1)	31 (3.2)	27 (2.4)	0.309	27 (2.1)	34 (3.7)	*0.023
Paralytic ileus	2 (2.1)	20 (2.1)	21 (1.9)	0.764	27 (2.1)	16 (1.8)	0.560
Cholangitis	4 (4.1)	46 (4.8)	59 (5.3)	0.502	56 (4.4)	53 (5.8)	0.124
Acute Hepatitis-E	1 (1)	9 (0.9)	5 (0.4)	0.178	10 (0.8)	5 (0.6)	0.517
Hepatitis-B	1 (1)	7 (0.7)	4 (0.4)	0.192	11 (0.9)	1 (0.1)	†*0.019
Drug induced liver injury	1 (1)	4 (0.4)	7 (0.6)	0.849	7 (0.5)	5 (0.6)	†1.00
Acute gastroenteritis	2 (2.1)	17 (1.8)	21 (1.9)	0.940	25 (2)	15 (1.7)	0.600
Constipation	3 (3.1)	8 (0.8)	8 (0.7)	0.123	12 (0.9)	7 (0.8)	0.676
Diarrhea	2 (2.1)	2 (0.2)	2 (0.2)	†0.073	2 (0.2)	4 (0.4)	†0.241
Celiac diseases	4 (4.1)	9 (0.9)	7 (0.6)	*0.014	6 (0.5)	14 (1.5)	*0.009
Irritable Bowel Syndrome	7 (7.2)	22 (2.3)	28 (2.5)	0.189	33 (2.6)	24 (2.6)	0.931
Inflammatory Bowel Disease	3 (3.1)	36 (3.7)	14 (1.3)	**0.001	36 (2.8)	17 (1.9)	0.157
Cholangiocarcinoma	1 (0.1)	2 (0.2)	6 (0.5)	†0.778	5 (0.4)	4 (0.4)	†1.00
Chronic pancreatitis	0 (0)	3 (0.3)	4 (0.4)	†0.753	2 (0.2)	5 (0.6)	†0.135
Pancreatic Carcinoma	0 (0)	10 (0.1)	24 (2.1)	*0.016	21 (1.6)	13 (1.4)	0.693
Peptic ulcer disease	3 (3.1)	16 (1.7)	17 (1.5)	0.409	22 (1.7)	14 (1.5)	0.744
Unexplained-Abdominal-pain	2 (2.1)	8 (0.8)	8 (0.7)	0.323	14 (1.1)	4 (0.4)	0.095
Metastatic disease	1 (0.1)	28 (2.9)	65 (5.8)	**<0.001	55 (4.3)	39 (43)	0.991
Acute on chronic liver failure	1 (0.1)	18 (1.9)	12 (1.1)	0.274	21 (1.6)	10 (1.1)	0.290
Hepatocellular carcinoma	0 (0)	21 (2.2)	44 (3.9)	**0.003	37 (2.9)	28 (3.1)	0.800
Acute cholecystitis	2 (2.1)	12 (1.2)	10 (0.9)	0.253	9 (0.7)	15 (1.7)	*0.036
Liver abscess	2 (2.1)	24 (2.5)	13 (1.2)	*0.044	30 (2.4)	9 (1)	*0.018
Gallbladder-carcinoma	0 (0)	6 (0.6)	17 (1.5)	*0.025	14 (1.1)	9 (1)	0.813
Gastric-outlet-obstruction	1 (0.1)	14 (1.4)	20 (1.8)	0.444	16 (1.3)	19 (2.1)	0.123
Sub-acute Bacterial Peritonitis	1 (0.1)	4 (0.4)	8 (0.7)	0.662	10 (0.8)	3 (0.3)	0.175

Table-III: Comparison of patients' clinical features among diagnosis.

Diagnosis	Admission Mode			Admitting ward				Length of stay			Outcomes		
	ER	OPD	*p*-value	Ward	HDU	ICU	*p*-value	≤7 days	>7 days	*p*-value	Discharged	Expired	*p*-value
Upper GI bleed	102 (14.4)	96(6.5)	**<0.001	127(6.7)	57(23)	14(32.6)	**<.01	126(9)	62(9.1)	0.957	187(9.2)	1(2.4)	†0.173
Lower GI bleed	32 (4.5)	37(2.5)	*0.012	58(3.1)	10(4)	1(2.3)	0.681	40(2.9)	21(3.1)	0.784	61(3)	-	†0.634
Functional dyspepsia	15 (2.1)	34(2.3)	0.788	46(2.4)	3(1.2)	-	0.287	33(2.4)	14(2.1)	0.656	47(2.3)	-	†1.00
Gastritis	48 (6.8)	103(7)	0.871	135(7.1)	13(5.2)	3(7)	0.543	94(6.7)	46(6.7)	0.989	140(6.9)	-	†0.111
Gastro-esophageal reflux disease	19 (2.7)	28(1.9)	0.234	45(2.4)	2(0.8)	-	0.171	34(2.4)	13(1.9)	0.447	45(2.2)	2(4.8)	†0.245
Upper GI malignancy	7 (1)	64(4.3)	**<0.001	70(3.7)	1(0.4)	-	*0.011	49(3.5)	20(2.9)	0.492	66(3.2)	3(7.1)	†0.161
Lower GI malignancy	2 (0.3)	14(0.9)	0.088	16(0.8)	0(0)	-	†0.450	12(0.9)	4(0.6)	0.504	16(0.80	-	†1.00
Chronic liver disease	261 (36.9)	377(25.5)	**<0.001	536(28.3)	90(36.3)	12(27.9)	*0.034	395(28.3)	211(30.9)	0.210	589(28.9)	17(40.5)	0.103
Acute liver failure	14 (2)	23(1.6)	0.475	32(1.7)	3(1.2)	2(4.7)	†0.257	19(1.4)	13(1.9)	0.342	29(1.4)	3(7.1)	*†0.025
Acute Hepatitis A	8 (1.7)	18(1.8)	0.901	25(1.9)	1(0.6)	-	†0.583	17(1.8)	8(1.7)	0.875	25(1.8)	0(0)	†1.00
Acute pancreatitis	5 (1.1)	56(5.5)	**<0.001	57(4.4)	4(2.5)	-	0.301	36(3.8)	24(5.1)	0.274	60(4.3)	0(0)	†0.398
Paralytic ileus	10 (2.1)	33(3.3)	0.217	35(2.7)	8(5)	-	†0.244	28(3)	10(2.1)	0.343	38(2.7)	0(0)	†1.00
Cholangitis	21 (4.3)	88(8)	**0.008	103(7.4)	6(3.7)	-	0.085	74(7.3)	31(6.2)	0.407	104(7)	1(2.8)	†0.510
Acute Hepatitis E	2 (0.3)	13(0.9)	†0.165	13(0.7)	2(0.8)	-	†0.770	8(0.6)	6(0.9)	†0.407	13(0.6)	1(2.4)	†0.249
Hepatitis B	6 (0.8)	6(0.4)	†0.220	10(0.5)	2(0.8)	-	†0.717	7(0.5)	5(0.7)	†0.544	12(0.6)	0(0)	†1.00
Drug induced liver injury	4 (0.6)	8(0.5)	†1.00	12(0.6)	-	-	†0.513	4(0.3)	7(1)	*0.047	11(0.5)	-	†1.00
Acute gastroenteritis	7 (1)	33(2.2)	*0.042	38(2)	2(0.8)	-	†0.439	24(1.7)	14(2.1)	0.603	39(1.9)	-	†1.00
Constipation	6 (0.8)	13(0.9)	0.940	19(1)	-	-	†0.279	15(1.1)	4(0.6)	0.273	18(0.9)	1(2.4)	†0.323
Diarrhea	-	6(0.4)	†0.186	6(0.3)	-	-	†1.00	6(0.4)	0(0)	†0.186	6(0.3)	0(0)	†1.00
Celiac diseases	8 (1.1)	12(0.8)	0.465	18(1)	1 (0.4)	1(2.3)	†0.357	14(1)	6(0.9)	0.788	19(0.9)	1(2.4)	†0.336
Irritable bowel syndrome	24 (3.4)	33(2.2)	0.112	52(2.7)	4(1.6)	1(2.3)	0.570	41(2.9)	14(2.1)	0.239	54(2.7)	1(2.4)	†1.00
Inflammatory bowel disease	13 (1.8)	40(2.7)	0.216	46(2.4)	5(2)	2(4.7)	0.584	33(2.4)	17(2.5)	0.855	50(2.5)	-	†0.624
Cholangiocarcinoma	3 (0.4)	6(0.4)	†1.00	7(0.4)	1(0.4)	1(2.3)	†0.228	8(0.6)	1(0.1)	†0.286	9(0.4)	-	†1.00
Chronic pancreatitis	2 (0.3)	5(0.3)	†1.00	6(0.3)	1(0.4)	-	†0.633	7(0.5)	0(0)	†0.104	7(0.3)	-	†1.00
Pancreatic Carcinoma	7 (1)	27(1.8)	0.138	32(1.7)	2(0.8)	-	†0.632	21(1.5)	11(1.6)	0.849	32(1.6)	-	†1.00
Peptic Ulcer Disease	12 (1.7)	24(1.6)	0.903	33(1.7)	1(0.4)	2(4.7)	†0.078	23(1.6)	12(1.8)	0.851	35(1.7)	-	†1.00
Unexplained Abdominal pain	1 (0.1)	17(1.2)	*0.015	18(1)	0(0)	-	†0.248	14(1)	4(0.6)	0.337	18(0.9)	-	†1.00
Metastatic disease	14 (2)	80(5.4)	**<0.001	88(4.7)	5(2)	1(2.3)	0.128	60(4.3)	29(4.3)	0.964	86(4.2)	3(7.1)	†0.423
Acute on chronic liver failure	9 (1.3)	22(1.5)	0.688	27(1.4)	4(1.6)	0(0)	†0.880	17(1.2)	12(1.8)	0.322	29(1.4)	-	†1.00
Hepatocellular carcinoma	11 (1.6)	54(3.7)	**0.007	63(3.3)	1(0.4)	1(2.3)	*0.038	45(3.2)	20(2.9)	0.723	63(3.1)	2(4.8)	†0.381
Acute cholecystitis	7 (1)	17(1.2)	0.735	19(1)	5(2)	-	†0.295	16(1.1)	7(1)	0.808	23(1.1)	0(0)	†1.00
Liver abscess	10 (1.4)	29(2)	0.364	33(1.7)	5(2)	1(2.3)	†0.672	22(1.6)	15(2.2)	0.312	37(1.8)	0(0)	†1.00
Carcinoma of gallbladder	1 (0.1)	22(1.5)	*0.004	22(1.2)	1(0.4)	-	†0.689	17(1.2)	6(0.9)	0.490	21(1)	2(4.8)	†0.077
Gastric outlet obstruction	9 (1.3)	26(1.8)	0.395	29(1.5)	5(2)	1(2.3)	†0.499	26(1.9)	8(1.2)	0.245	31(1.5)	3(7.1)	*0.030
Sub-acute bacterial peritonitis	6 (0.8)	7(0.5)	†0.372	11(0.6)	2(0.8)	-	†0.734	8(0.6)	5(0.7)	†0.768	13(0.6)	-	†1.00

*Fisher-exact test, *Significant p<0.05, **Significant p<0.01.*

DISCUSSION

The motif of diseases has switched in developing countries. Pakistan is still facing challenges regarding the control as data on the GILD varied from acute to chronic symptoms. Divergence in the ornamentation-linked admissions is limited as with an ageing population, incidence, prevalence, mortality, and burden foist on the community of digestive diseases is glean to grow.[12-14]

The pattern of admission recorded in this study varied, Peery et al. stated that as the population grows old, ailments related to gastrointestinal are distinct to observed more which was in accordance with our study.[6] The most common presented symptom was abdominal pain followed by jaundice. Other symptoms include abdominal distention, hematemesis, and bleeding per rectum. Contradicting to study by Almario *et al,* were most commonly observed symptom was heartburn/reflux.[12]

The foremost cause for admissions was decompensated CLD. The outcomes were in dissimilarity to the study by Lesi *et al,* concluded, that dyspepsia was the chief reason for consultation,[15] and similar to Adelye *et al,*[11] almost one-third with known risk factors including ALD, HBV or HCV progressing to decompensation including ascites, varices, renal failure, ACLF and/or HCC.[16]

Another major cause in the study was upper gastrointestinal bleeding due to Varices or PUD, and it is essential to assess every patient using endoscopic studies cautiously. However, PUD-related haemorrhages have dropped over the last decade, which may be secondary to the eradication of Helicobacter pylori.[1]

Similar to other studies, Dyspepsia/Gastritis was a common reason for consultations. The lower frequency may be accredited to the fact that most patients do not seek medical care, as many would rather substitute or self-medicate because of the greater cost of hospital care. This study also exhibited dyspeptic symptoms often found among females similar to an existing acquaintance.[17]

Cholangitis of variable intensity includes mild, moderate or severe, need fluid and antibiotics administration along with biliary drainage endoscopically followed by cholecystectomy in patients with gallstone accordingly, Ahmed *et al*,[18]

Metastatic disease adopted diverse notions for liver disease, including NAFLD, viral infection, cirrhosis, HCC and/or any combination. Wang et al. higher incidence of simultaneous Liver metastasis in patients with HBsAg.[19]

In general, gastritis was higher among men, to Feyisa *et al*. contradicting our study where females were dominant,[20] and acute cholecystitis, as women are more likely, especially during their reproductive years, when the incidence is 2-3 times that in men, primarily due to estrogen, which surges biliary cholesterol secretion.[21]

Proportions of males with HBV were higher, and this could be due to the raised serum testosterone level, which is assumed to cause synergistic relation between the HBV and male gender.[11]

Comparison of patients' clinical characteristics among different diseases. Admissions through emergency in monitoring setup were significantly higher for CLD with complications including Variceal bleed, hepatic encephalopathy, ascites and/or ACLF depending on a range of causalities and a spectrum of severity on presentation, which is a common reason for admission, leading to mortality.[22]

Extended length of stay and frequency of expiry was significant among patients with ALF secondary to drug-induced. As the Liver is the main site for drug metabolism, producing free radicals initiates and propagates hepatocyte damage leading to acute liver failure with a high mortality rate.

We observed emerging issues that need to be addressed by gastroenterologists, significantly increasing the burden and cost of developing several chronic GI-related diseases. Diseases are advancing, and access to health-related resources is scarce. For example, NAFLD will increasingly become the leading cause of chronic liver disease. These data provide insight into epidemiological changes and implications for hospital burden to re-allocate the resources and planning health policy.

LIMITATIONS OF STUDY

The inability to investigate some of the patients in detail was accredited as a limitation. Another short coming of the study was to capture the burden of some multifaceted diseases.

CONCLUSION

Notably, highly evitable diseases are still a foremost reason of clinical importance, lack of awareness and low cure rate, especially in rural areas progress to high fatality as most patients do not seek medical assistance until significant manifestation. This appeals to more effective measures, including eradicating the potentially life-threatening disease.

Conflict of Interest: None.

Authors' Contribution

MFZ: Idea, data collection, manuscript writing, SK: Data collection, manuscript writing, HAK: Data analysis, manuscript writing, RKW: Manuscript writing, MF:, MHB: Manuscript writing, proof reading.

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