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Spectrum of gastrointestinal diseases and outcome in a tertiary gastroenterology and hepatology unit in Rivers State, Nigeria: A 2 year review

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Abstract

Background: Diseases of the liver and the gastrointestinal tract constitute a leading cause of morbidity and mortality worldwide and understanding this is important in health policy formulation and implementation. Clinical data on gastrointestinal and liver-related admissions and disease burden are limited in many parts of Sub-Saharan Africa, Nigeria inclusive.'

Method: This was a 2-year retrospective review of all patients aged 18 years and above who were admitted into the gastroenterology unit during the study period. The data were analyzed with Statistical Package for the Social Sciences (SPSS) version 25. The categorical variables were presented as proportions and percentages while numerical variables were presented as means and standard deviations.

Results: A total of 393 patients were admitted into the Gastroenterology unit over the period of study comprising 214(54.5%) males and 179(45.5%) females in the ratio of 1.2:1. The 5th decade of age accounted for majority of the admissions. The commonest Gastroenterology diseases documented included Chronic Liver disease and Diarrhoea diseases which occurred in 101 (25.7%) and 69 (17.6%) respectively. Others are UGIB. 49 (12.5%), PUD 47 (12.0%) and viral hepatitis 31 (7.9%). During this period 101 deaths were recorded representing 25.7% of gastrointestinal admissions with a mean age at death of 57.45±15.53 years. Chronic Liver disease was the major contributor to mortality in 38 (37.61%) followed by diarrhea in 13(12.6%) persons.

Conclusion: Gastrointestinal and Liver diseases are a significant cause of disease burden and mortality in the medical wards with Liver related diseases and chronic diarrheas accounting for a majority of them. Emphasis should be placed on policies focused on mitigating the risk factors for these diseases, increased public awareness, and provision of basic amenities in order to combat them

Keywords: Pattern; Spectrum; Gastrointestinal diseases; Outcome; Mortality; Liver diseases

1. Introduction

The trend in gastrointestinal admissions in an institution are dependent on the prevalent gastrointestinal disorders, socioeconomic/environmental factors, lifestyle, cultural norms, and the general burden of both communicable and non-communicable disease in that region. Diseases of the Liver and the gastrointestinal tract constitute a leading cause of morbidity and mortality worldwide and understanding this is important in health policy formulation and

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implementation. (1,2) It is important for national policy makers to understand the regional heterogeneity of the pattern and prevalence of gastrointestinal and hepatic diseases despite their existence as a nation. Regrettably, clinical data on the gastrointestinal and liver-related admissions are limited, (3) and 'there is a paucity of epidemiological data on the burden of gastrointestinal and liver-related diseases in many parts of Sub-Saharan Africa Nigeria inclusive'. (1)

Africa has a disproportionately high burden of communicable gastrointestinal diseases amongst which are viral hepatitis B and C, cholera, typhoid fever, amoebiasis, and also a comparable incidence of non-communicable diseases such as hypertension, diabetes mellitus and hepatobiliary cancers that impact the gastrointestinal system. (2) Developing nations make up the bulk of high endemicity countries for Hepatitis B infection(4), and 17.9% of deaths in low-income countries are due to diarrhea compared to 1.6% in high income countries. (5) The prevalence of *Helicobacter pylori* and its subsequent consequences are higher in developing countries such as Nigeria and are influenced by the prevailing challenges of younger age of acquisition, socioeconomic status, household crowding, ethnicity, and infection status of family members. (6) In a 2007 study on pattern of medical admissions in Port Harcourt, Nigeria, Agomuoh et al (2007) stated that viral hepatitis, chronic liver disease, and amoebic liver disease were among the top ten diseases identified as reasons for admission into medical wards. (7)

Mandeville et al (4) in their review on gastroenterology in developing countries reported that "diseases affecting both western and developing countries are often seen in more florid forms in developing countries and they shoulder a considerable burden of gastroenterological diseases, in particular infectious diseases which cause enormous morbidity and mortality". Moreover, guidelines developed for the different disease conditions are usually based on the experience of the more developed societies thus having little or no impact on developing countries such as Nigeria.

2. Methodology

This study was conducted at the Rivers State University Teaching Hospital (RSUTH) located in Port Harcourt, the capital of Rivers State, in the South-South region of the Federal Republic of Nigeria. The RSUTH is a 500 bedded state government owned tertiary health institution of which 150 beds are in the medical wards and it serves a population of 7.4 million people in Rivers State and numerous unnumbered populations from neighboring states.

This was a 2-year retrospective cross-sectional hospital-based study (from January 2021 to January 2023) of the admission database of adult patients of the gastroenterology unit in the medical wards of the Rivers State University Teaching Hospital.

The records of all patients aged 18 years and above who were admitted into the gastroenterology unit during the study period were included however those with incomplete data or aged less than 18 years were excluded. The admission, discharge, and mortality registers of the male and female medical wards were utilized to extract information on biodata (age, sex), admitting diagnosis, duration of admission, and patients' outcome of all gastroenterology admissions over this three-year period. All the diagnoses were based on the final diagnoses made by the supervising gastroenterologist after a thorough assessment of the clinical, radiological and laboratory parameters of patients.

Ethical approval was obtained from the Health Research and Ethics Committee of the hospital. (RSUTH/REC/2023378).

The data were analyzed with Statistical Package for the Social Sciences (SPSS) version 25. The categorical variables were presented as proportions and percentages while numerical variables were presented as means and standard deviations. Chi-square and Fisher's exact test were used to test for significant relationships between variables and a p value of <0.05 was considered statistically significant.

3. Results

This is a 2-year retrospective study of 393 patients admitted in the gastroenterology unit of the medical wards of the RSUTH. The Mean age was 52.33 ± 17.10 years with a range of 18 to 90 years. Males accounted for 54.5% (n=214) of the total admitted Gastroenterology patients compared to 45.5% (n=179) of females with a male to female ratio is 1.2:1.

The 5th decade accounted for majority of the admissions while the least prevalence was above the 8th decade as illustrated in table 1.

Table 1 Sex and Age group distribution of Gastroenterology unit admission in the medical wards

Age group	Male Frequency (%)	Female Frequency (%)	Total Frequency (%)
18-30years	25(11.7)	17(9.5)	42(10.7)
31-40years	34(15.9)	32(17.9)	66(16.8)
41-50years	47(22.0)	38(21.2)	85(21.6)
51-60years	35(16.1)	28(15.5)	63(16.0)
61-70years	33(15.4)	33(18.4)	66(16.8)
71-80years	28(13.1)	26(14.5)	54(13.7)
≥81years	12(5.6)	6(2.8)	17(4.3)
Total	214(100.0)	179(100.0)	393(100.0)

$$\chi^2 = 3.180, p = 0.777$$

The commonest Gastroenterology diseases documented included Chronic Liver disease (CLD) and Diarrhoea diseases which occur in 101 (25.7%), and 69 (17.6%) respectively while Pancreatic disease. 7 (1.8) and Gall bladder disease. 5 (1.3) were the least common. See figure 1.

As demonstrated in Table 2, CLD, Viral hepatitis, Alcoholic liver disease and Diarrhea diseases occurred in more males than females whereas Peptic ulcer, upper Gastrointestinal bleeding, intraabdominal malignancy and Liver cancer were more common in women; and this difference was statistically significant.

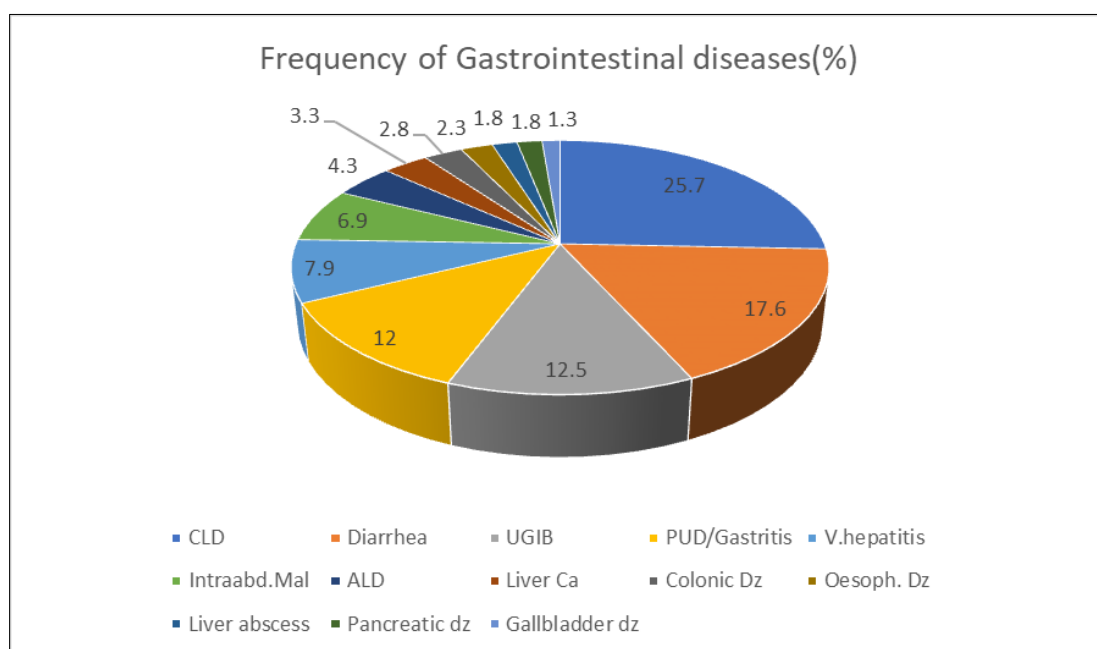
**Figure 1** Distribution of Gastrointestinal diseases in the study population (%)

Table 2 Distribution of Gastrointestinal diseases among the sexes

Diagnosis	Sex		Total
	Male Frequency (%) N=214	Female Frequency (%) N=179	
D. Chronic Liver Disease	67(66.3)	34(33.7)	101
Viral Hepatitis	25(80.6)	6(19.4)	31
Diarrhoea diseases	35(50.7)	34(49.3)	69
Peptic ulcer disease	18(38.3)	29(61.7)	47
Upper GI bleeding	24(49.0)	25(51.0)	49
Alcoholic liver disease	12(70.6)	5(29.4)	17
Liver abscess	4(57.1)	3(42.9)	7
Oesophageal disease	6(66.7)	3(33.3)	9
Liver cancer	5(38.5)	8(61.5)	13
Colonic disease	6(54.5)	5(45.5)	11
Intraabdominal malignancy	10(37.0)	17(63.0)	27
Pancreatic disease	2(28.6)	5(71.4)	7
Gallbladder disease	0(0)	5(100.0)	5

Fishers exact test =35.104, p<0.005

Comparing the frequency of Gastrointestinal diseases with the age groups of the patients (Table 4), Chronic Liver disease occurred more commonly in young and middle-aged patients (41-60years), diarrhoea amongst the 41-50years old upper gastrointestinal bleeding in the elderly while viral hepatitis was evenly distributed among the young and middle-aged patients.

Table 3 Comparison of Gastrointestinal diseases with the age groups of the patients

Diagnosis	Age group (in years)							
	18-30 f (%)	31-40 f (%)	41-50 f (%)	51-60 f (%)	61-70 f (%)	71-80 f (%)	≥81 f (%)	
D. CLD	9(8.9)	21(20.8)	25(24.8)	25(24.8)	11(10.9)	7(6.9)	3(3.0)	
Viral hepatitis	6(19.4)	8(25.8)	7(22.6)	6(19.4)	2(6.5)	2(6.5)	0(0)	
Diarrhoea diseases	10(14.5)	4(5.8)	19(27.5)	11(15.9)	12(17.4)	6(8.7)	7(10.1)	
PUD	4(8.5)	11(23.4)	13(27.7)	6(12.8)	2(4.3)	8(17.0)	3(6.4)	
UGIB	2(4.1)	6(12.2)	6(12.2)	4(8.2)	18(36.7)	12(24.5)	1(2.0)	
Alcoholic liver disease	2(11.8)	5(29.4)	1(5.9)	0(0)	5(29.4)	3(17.6)	1(5.9)	
Liver abscess	1(14.3)	1(14.3)	1(14.3)	2(28.6)	0(0)	2(28.6)	0(0)	
Oesophageal disease	2(22.2)	2(22.2)	3(33.3)	0(0)	1(11.1)	1(11.1)	0(0)	
Liver cancer	1(7.7)	1(7.7)	3(23.1)	0(0)	6(46.2)	2(15.4)	0(0)	
Colonic disease	1(9.1)	1(9.1)	0(0)	2(18.2)	2(18.2)	4(36.4)	1(9.1)	
Intraabdominal malignancy	4(14.8)	4(14.8)	4(14.8)	6(22.2)	4(14.8)	4(14.8)	1(3.7)	
Pancreatic disease	0(0)	2(28.6)	2(28.6)	0(0)	2(28.6)	1(14.3)	0(0)	
Gallbladder disease	0(0)	0(0)	1(20.0)	1(20.0)	1(20.0)	2(40.0)	0(0)	

Fishers exact test = 17.93, p=0.004. DCLD: Decompensated Chronic Liver Disease. UGIB: Upper Gastrointestinal bleeding. PUD: Peptic ulcer disease

3.1. Outcome of Gastroenterology admissions

Of the 393 patients admitted into the gastroenterology unit during the period in review, 101 persons died which accounted for 25.7% of all total admissions, 259 were discharged home and 28 signed against medical advice. (Table 5) The mean age of the deceased was 57.45 ± 15.53 years (Range 20 to 88 years), and mortality was higher in males as they accounted for 64.4% (n=65) of mortality compared to 36 Female (35.6%) with a Male to female ratio is 1.8:1. The mean duration of admission before death was 10.02 ± 10.10 days with a range of 1-54 days and a Median of 7 days (IQR 3.0 to 14.0). Forty-three (42.6%) gastroenterology deceased inpatients died within 7 days of admission, while 30 (29.7%) and 28 (27.7%) died within 7-14 days and after 14 days respectively.

Table 4 Outcome of Gastroenterology admissions

Outcome	Frequency (%) N=393
Discharged home	259(65.9)
Deceased	101(25.7)
Transferred/Referred	5(1.3)
Signed against medical advice	28(7.1)

Mortality from Gastroenterological diseases in the admitted patients were mainly caused by decompensated Chronic Liver disease in 38 (37.6%) persons and diarrhoea diseases in 13 (12.9%) persons. (table 6) Other contributors to Gastroenterological mortality include Peptic ulcer disease/gastritis in 9 (8.9%) persons, Upper GI bleeding in 8 (7.9%) Persons and Alcoholic Liver disease in 5 (5%) persons.

Table 5 Distribution of Gastroenterology diagnosis at death by sex among the patients

Diagnosis at death	Sex		Total Frequency
	Male Frequency (%)	Female Frequency (%)	
DCLD	29(76.3)	9(23.7)	38
Viral Hepatitis	5(55.6)	4(44.4)	9
Diarrhoea diseases	7(53.8)	6(46.2)	13
PUD	4(44.4)	5(55.6)	9
UGIB	3(37.5)	5(62.5)	8
Alcoholic liver disease	5(100)	0(0)	5
Liver abscess	1(50.0)	1(50.0)	2
Oesophageal disease	1(100)	0(0)	1
Liver cancer	4(57.1)	3(42.9)	7
Colonic disease	3(100)	0(0)	3
Intraabdominal malignancy	3(50.0)	3(50.0)	6
Pancreatic disease	0(0)	0(0)	0
Gallbladder disease	0(0)	0(0)	0
Total	65(64.4)	36(35.6)	101

Fishers exact test =13.231, p=0.211CLD: Decompensated Chronic Liver Disease. UGIB: Upper Gastrointestinal bleeding. PUD: Peptic ulcer disease

Gastroenterology related mortality was highest in patients diagnosed of DCLD affecting more males and patients aged 41-50 years than any other age groups. Furthermore, older patients between ages 62-80 years were most likely to have been diagnosed of PUD and UGIB at the time of their demise. (table 7)

Table 6 Distribution of Gastroenterology diagnosis at death by age groups of the patients

Diagnosis at death	Age group (in years)							Total
	18-30 f (%)	31-40 f (%)	41-50 f (%)	51-60 f (%)	61-70 f (%)	71-80 f (%)	≥81 f (%)	
DCLD	3(7.9)	1(2.6)	13(34.2)	10(26.3)	8(21.1)	2(5.3)	1(2.6)	38
Viral Hepatitis	1(11.1)	1(11.1)	3(33.3)	2(22.2)	1(11.1)	1(11.1)	0(0)	9
Diarrhoea diseases	0(0)	1(7.7)	4(30.8)	2(15.4)	3(23.1)	1(7.7)	2(15.4)	13
PUD	0(0)	0(0)	3(33.3)	1(11.1)	0(0)	4(44.4)	1(11.1)	9
UGIB	0(0)	0(0)	1(12.5)	1(12.5)	4(50.0)	1(12.5)	1(12.5)	8
Alcoholic liver disease	0(0)	1(20.0)	0(0)	0(0)	1(20.0)	2(40.0)	1(20.0)	5
Liver abscess	0(0)	0(0)	0(0)	1(50.0)	0(0)	1(50.0)	0(0)	2
Oesophageal disease	0(0)	0(0)	1(100)	0(0)	0(0)	0(0)	0(0)	1
Liver cancer	0(0)	1(14.3)	1(14.3)	0(0)	3(42.9)	2(33.3)	0(0)	7
Colonic disease	0(0)	1(33.3)	0(0)	1(33.3)	0(0)	0(0)	1(33.3)	3
Intra-abdominal malignancy	0(0)	0(0)	1(16.7)	2(33.3)	1(16.7)	2(33.3)	0(0)	6
Pancreatic disease	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0
Gallbladder disease	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0
Total	4 (4.0)	6 (5.9)	27 (26.7)	20 (19.8)	21 (20.8)	16 (15.8)	7 (6.9)	101

Fishers exact test = 58.064, p=0.380. DCLD: Decompensated Chronic Liver Disease. UGIB: Upper Gastrointestinal bleeding. PUD: Peptic ulcer disease

4. Discussion

In this 2-year review of 393 patients admitted into the Gastroenterology unit of the RSUTH, there was a preponderance of male patients compared to female patients and this is consistent with findings by other Authors. (8-10) The scope of gastrointestinal diseases admitted were broadly Liver diseases of multiple etiologies, viral hepatitis, peptic ulcer disease and upper gastrointestinal bleeding.

Decompensated chronic liver disease accounted for over a quarter (>25%) of the admitted Gastroenterology patients and this may be due to the nature of the study which is tertiary hospital-based study where severe forms of diseases are referred to usually in the terminal stages of illness. Furthermore, there is a high prevalence of chronic HBV induced chronic liver disease in Nigeria accounting for up to 60% of them (11,12) and they are usually asymptomatic and silent until late. Thus, a high fraction of Liver disease patients presents late with decompensation. Multiple factors could play a role in the high burden of liver diseases in this study and these include chronic consumption of alcohol as the custom is in the South-South region of Nigeria (13), increased intake of herbal products (10,14), the presence of Aflatoxins in ingested grains (15) resulting in idiopathic Liver disease and the underreported and underestimated rising prevalence of NAFLD now MAFLD in Sub-Saharan Africa. (16)

Nigeria has one of the worst prevalence rates of diarrhea -18.8% in Sub-Saharan Africa. (17) This study also identified chronic diarrhea as a major cause of Gastroenterology admission (17.6%) and a major contributor to mortality in the medical wards and this is similar to rates reported by other researchers (18,19) which has been attributed to poverty/poor socio-economic status, cost of treatment and antimicrobial resistance. As reported in other studies, HIV, a major etiological factor in diarrhea diseases in developing countries may also have contributed to a high burden of diarrhea diseases as well as diarrhea related mortality in this study. (8,20)

Mean age for mortality in this study was 57.45±15.53 years with a higher prevalence in males (64.4%) and this is in keeping with the current reported Life expectancy in Nigeria of 56.36 years. (21) Comparably, males have been reported to have the highest mortality rates from digestive diseases across all racial and ethnic groups. (22,23) furthermore, a higher number of patients who were diagnosed of Peptic ulcer disease (PUD) and upper gastrointestinal bleeding (UGIB) are females occurring in 29 (61.7%) and 25(51.0%) female patients with the highest mortality rates in those

aged 62-80 years. Conversely, the mortality rate from UGIB of 7.9% obtained in this study is however lower than that of a similar study conducted in Yenagoa, Nigeria (8) and maybe due to easier access to the hospital and other socio-economic /geopolitical factors. Finally, while diseases of the other organ systems are common causes for admission in Rivers State University Teaching Hospital (RSUTH), (24) mortality from gastrointestinal and Liver related diseases are relatively higher as shown in this study.

A major limitation of this study is the retrospective nature of the study and the lack of electronic records which may result in missing data and entry errors. This study is also limited by the lack of adequate updated investigative capacity for gastrointestinal and hepatic diseases, and the paucity of pathological determination of mortality due to cultural bias

5. Conclusion

Gastrointestinal and Liver diseases are a significant cause of disease burden and mortality in the medical wards with Liver related diseases and chronic diarrheas accounting for a majority of them. Emphasis should thus be placed on mitigating the risk factors for these diseases including increased public awareness of the etiological agents of liver diseases [such as viral hepatitis B and C, alcohol consumption, use of herbs and roots], increased screening and provision of basic amenities such as safe drinking water. Infrastructural rehabilitation, public disease registries and migration to electronic medical record keeping system will aid in better assessment of disease burden and patients' data preservation.

Compliance with ethical standards

Disclosure of conflict of interest

The authors declare no conflict of interest.

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