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Epidemiological Profile of Gastrointestinal Cancers in Douala, Littoral Region of Cameroon: A Hospital-Based Retrospective Study, 2016 – 2020

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Authors' contributions

This work was carried out in collaboration among all authors. Authors JGLFEP, FKK and PMJD conceived the idea and designed the study. Authors JGLFEP, JPNM, OZ, NWB, MS, LMA and COE collected field data. Authors JGLFEP, LPKF and ELEE drafted the first version of the manuscript and analysed and interpreted data. Authors JGLFEP, FKK, LPKF and ELEE also contributed to data interpretation. Authors FKK, JPNM, LPKF, COE, AMS, ARNN and PMJD revised the manuscript for important intellectual content. Authors FKK and PMJD supervised the work at all stages. All the authors read and approved the final manuscript before submission.

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ABSTRACT

Aim: Cancer is a real public health problem in the world, especially the so-called gastrointestinal cancers (GIC). In Cameroon, epidemiological data on these types of cancers are still poorly known. The present study aimed at determining epidemiological profile GIC in the town of Douala, Cameroon.
Methodology: This was a retrospective study conducted at oncology and gastroenterology departments of two reference hospitals. Sociodemographic, clinical and toxicological information of the patients was recorded and analysed using SPSS version 26.0. The significance level was set at *p*-value < 0.05 for statistical tests.
Results: During the study period, 479 cases of GIC cases were registered with male-to-female ratio of 1.20. The frequency of GIC cases gradually increased over study period (2016 – 2020). GIC cases were mostly found in patients aged 50-60 years (27.8%) and 60-70 years (27.3%). The main GIC types included colorectal (36.54%), liver (25.26%), stomach (15.24%) and pancreas (12.53%). A gender-specific distribution of all GIC types were found ($p = 0.0016$). Among men, the distribution of GIC varied with age; the majority of male patients with stomach cancer (54.3%) were aged 50 – 60 years while those diagnosed with colon cancer were mostly aged 50 – 60 years (35.4%) and 60 – 70 years (31.3%) ($p = 0.0004$). Finally, a statically significant association was found between GIC distribution and alcohol/tobacco consumption.
Conclusion: GIC are realities in Cameroon and mainly affect the population over 30 years old. The knowledge of risk factors in the population would be useful for controlling their evolution in the country.

Keywords: Gastro-intestinal cancers; epidemiological profile; retrospective study; Douala.

1. INTRODUCTION

Cancer is one of the leading cause of death worldwide [1]. Gastrointestinal cancer (GIC) is a generic term encompassing cancers of the colon, rectum, stomach and oesophagus, alongside other gastro-intestinal tract-associated organs including the pancreas, liver, gallbladder, and bile ducts [2,3]. These cancers affect body surfaces covered by the most rapidly renewing epithelium in the body, and cumulatively account for about half of all cancer-related deaths worldwide.

Gastrointestinal cancers are complex and multifactorial diseases; with poor survival rates in GIC patients due to late diagnosis at advanced stages in health facilities, as well as complications from the type of GIC [3]. Several factors have been identified to increase the risk of GIC, and these include mainly infections, smoking, dietary (e.g., high intake of salty foods, preserved meat and alcohol, and low citrus fruits consumption), genetic and even hormonal factors [3]. Liver cancer, mainly caused by infections with hepatitis B and C viruses, is ranked 6th most common cancer and 2nd largest cause of cancer-related deaths in the world [4,5]. Pancreas cancer is a lethal malignant neoplasm largely prevalent in developed countries, where it is an important cause of cancer mortality [6,7]. Oesophageal cancer is the 8th most common cancer type and sixth leading cause of cancer deaths worldwide, with its main risk factors being low socioeconomic status, consumption of tobacco, alcohol, hot beverages, nitrosamines, and micronutrient deficiencies [8]. Colorectal cancer is the cancer most frequently associated with inflammatory bowel diseases [9].

In Africa and Europe, data on digestive cancers are somewhat disparate. In Cameroon, epidemiological data on digestive cancers are lacking due to the absence of a national cancer register. In this line, it is crucial to produce data on the epidemiology of these cancers, so as to determine their frequency and proportions, characterize their evolutionary trends, identify at-risk groups and develop etiological hypotheses. To efficiently achieve these objectives in future, the present study was designed and conducted to determine the epidemiological patterns of GIC cases diagnosed and treated between 2016 and 2020 in two reference hospitals in Douala, metropolitan city of Cameroon.

2. METHODS

2.1 Study Site

This study was carried out at the gastroenterology and oncology units of the

Douala General Hospital and Laquintinie Hospital. The Douala General Hospital (DGH), located in the Beedi neighbourhood, is one of the five first-class hospitals in Cameroon. It has a 630-bed capacity and offers a wide range of services including predominantly internal medicine, rheumatology, cardiology, neurology, endocrinology-diabetology, oncology and gastroenterology.

The Laquintinie Hospital Douala (LHD) is a 2nd category reference hospital built on over 9 hectares at the heart of Douala. Its mission is to provide high-quality medical and medico-surgical care, as well as respond to major events (sporting, natural disasters, epidemics), via several units from intensive care, infectiology, oncology, emergency, gastroenterology to clinical laboratory.

The intensive Oncology care units of these hospitals deal with almost all cancer-related pathologies.

2.2 Study Design

A retrospective cross-sectional hospital-based observational study over a five-year period (January 2016 - December 2020).

2.3 Eligibility Criteria

All GIC cases confirmed by a histopathologist and/or a gastroenterologist (histologically) were retained. Conversely, we excluded from this study all other cancer types different from cancers of the gastrointestinal tract (e.g., digestive tumours and borderline cancers as well as cases of intraepithelial neoplasms).

2.4 Study Population

The study population comprised of all patients admitted at the DGH and LHD for management of any GIC. These participants were identified from review of patients' records, at the hepato-gastroenterology and oncology departments of the two above-mentioned hospitals, and selected upon confirmation of the presence of carcinoma of the gastrointestinal tract (GIT).

2.5 Patients Recruitment and Studied Variables

We consulted all the medical records of patients admitted to the gastroenterology and oncology units from 2016 to 2020. Only GIC cases were retained for analysis.

All epidemiological data available in patients' medical records were extracted. These comprised of sociodemographic information (gender, age, ethnicity, marital status, occupation), clinical and toxicological data (GIC type, grade and stage, alcohol and tobacco consumption) as well as any personal and family medical history.

We termed "unspecified" all cancers originating from the GIT with no exact specification of the affected organ/tissues.

2.6 Statistical Analysis

Data were entered, verified for consistency and coded in an Excel spreadsheet (Microsoft Office, 2010, USA) and then analysed using SPSS (Statistical Package for Social Sciences) software version 26.0 for Windows (IBM SPSS, Chicago, IL, USA). Data were presented as percentages and mean ± standard deviation (SD). Goodness-of-fit Pearson's Chi-square test and Fisher's exact test were used to compare the percentages. The significance level was set at *P*-value < 0.05.

3. RESULTS

3.1 Sociodemographic Characteristics of Patients

During the study period 479 incident GIC cases were recorded. The mean age was 54.4 ± 13.58 with a male-to-female ratio of 1.20. Patients age 60 – 70 years and 50 – 60 years represented 27.8% and 27.3% of the patients then followed by those aged 30 – 40 years (13.8%) and 40 – 50 years (13.6%) (Table 1).

3.2 Evolution of Cancer Cases Diagnosis with Time

As depicted in Fig. 1, a smooth increase in the yearly proportion of GIC cases was observed over time. Despite a drop in GIC frequency in 2017 (52 cases; 10.9%), peak incidence was seen in 2018 (99 cases; 20.7%). The frequency then slowly dropped till 2020.

Table 1. Sociodemographic characteristics of the study population

Variables	Frequency (*n*)	Percentage (%)
Gender		
Female	218	45.5
Male	261	54.5
Age (years)		
[10 – 20[	2	0.4
[20 – 30[	25	5.2
[30 – 40[	66	13.8
[40 – 50[	65	13.6
[50 – 60[	131	27.3
[60 – 70[	133	27.8
[70 – 80[	48	10.0
[80 – 90[	9	1.9
Marital status		
Single	101	21.1
Married + widowed	569	77
Divorced	9	1.9
Region of origin		
Adamawa	4	0.8
Centre	30	6.3
East	4	0.8
Far North	3	0.6
Littoral	110	23.0
North	9	1.9
North-West	19	4.0
West	262	54.7
South	8	1.7
South-West	25	5.2
Foreigner	5	1.0
Total	479	100.0

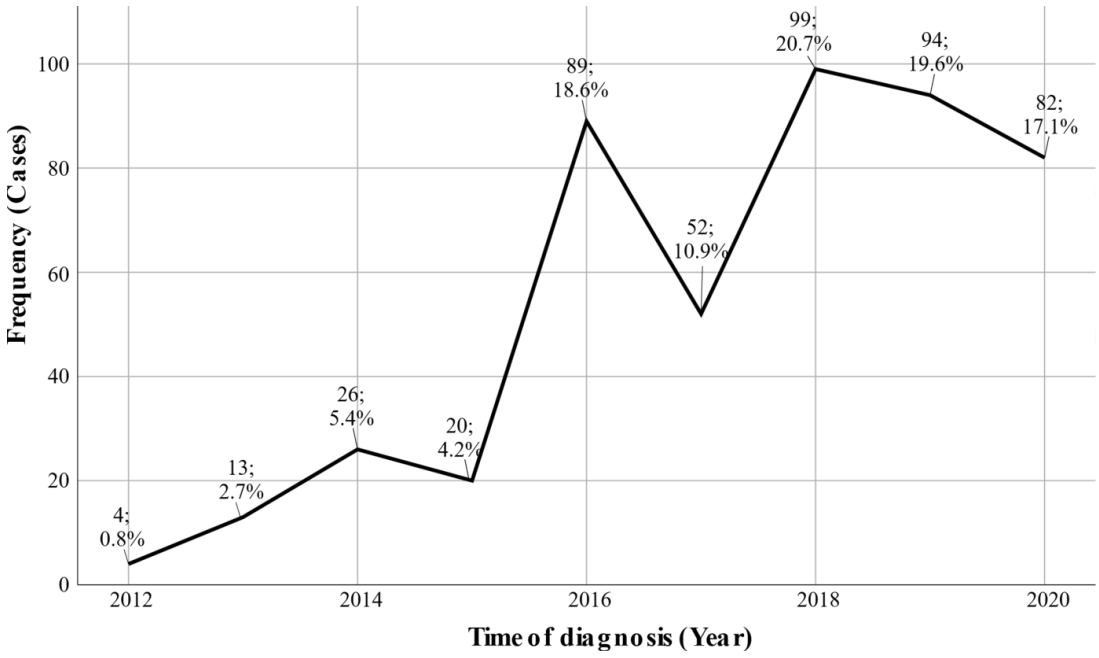

Fig. 1. Frequency of gastrointestinal cancer cases diagnosed over time

3.3 General Epidemiological Profile of Gastro-intestinal Cancers

Colorectal cancer was the most diagnosed in patients (36.54%) followed by liver cancer (25.3%) while intestinal cancer was the less frequently found (2.3%) (Fig. 2).

3.4 Cancer Distribution by Gender

A gender-specific distribution of most of the GIC cancers was noted in this study with higher proportion of liver, colon, colorectal and bucco-oesophagial cancers in males. For instance, the proportion of liver cancer was 30.27% in males and 19.27% in females (Fig. 3). In contrast, rectum, pancreas, liver and intestinal cancers were more frequently seen in females compared to their male counterparts. The differences were statistically significant (*p*-value = 0.016; Phi = 0.198) (Fig. 3).

3.5 Distribution Profile of Cancers Stratified by Gender and Age

3.5.1 Males

GIC distribution in males showed a complete absence of those aged between 10 and 20 years while those aged between 50 – 60 years and 60 – 70 years were the most represented (29.5% and 29.1% respectively) (Table 2). There was a statistically significant association with moderate effect size (*p*-value = 0.004; Phi = 0.515) between the distribution of GIC types and age groups. Liver cancer (30.3%) were largely seen in males aged 50 – 60 and 60 – 70 age groups (19 cases each). Most of patients diagnosed with stomach cancer (54.3%) were in the 50 – 60 age group and those with colon cancer were predominantly aged between 50 – 60 years (35.4%) and 60 – 70 years (31.3%). Colorectal and intestinal cancers (~3%) were the least frequently encountered in this study group.

3.5.2 Females

The distribution pattern of GIC among females outlined the predominance of liver cancer (19.3%) followed by stomach and rectum cancers (17.4% each) (Table 3). Women aged between 60 - 70 years were mainly diagnosed with pancreatic cancer (42.4%). Stomach cancer was frequently observed among women aged 60 – 70 age group (31.6%) while colon cancer was greatly seen in their aged 50 – 60 aged counterparts (31.6%). Despite the uneven distribution of cancers across the age groups there was no statistically significant association between cancer types and age (*p*-value = 0.137).

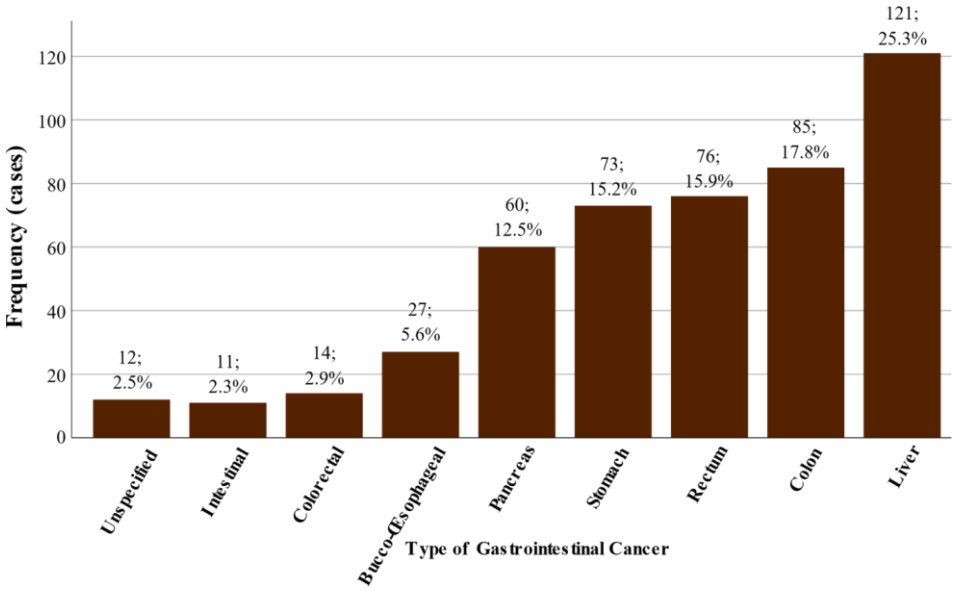

Fig. 2. Different localisation of gastrointestinal cancers identified

*Percentages presented on each bar were computed from the cases count on the y-axis. Colorectal * = Rectum + Colon + Colorectal.*

Table 2. Gastrointestinal tract cancer distribution among males with respect to age

Age groups (years)	Types of gastrointestinal cancer									Total (%)	*P*-value
	Rectum *n* (%)	Pancreas *n* (%)	Intestinal *n* (%)	Stomach *n* (%)	Liver *n* (%)	Colorectal *n* (%)	Colon *n* (%)	BO *n* (%)	Unspecified *n* (%)		
[10-20[	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0.004
[20-30[	4 (10.5)	1 (3.7)	1 (12.5)	1 (2.9)	3 (3.8)	0 (0.0)	0 (0.0)	1 (6.7)	0 (0.0)	11 (4.2)	
[30-40[	8 (21.1)	0 (0.0)	1 (12.5)	0 (0.0)	16 (20.3)	1 (11.1)	5 (10.4)	1 (6.7)	1 (50.0)	33 (12.6)	
[40-50[	6 (15.8)	4 (14.8)	0 (0.0)	2 (5.7)	14 (17.7)	2 (22.2)	7 (14.6)	2 (13.3)	0 (0.0)	37 (14.2)	
[50-60[	7 (18.4)	6 (22.2)	1 (12.5)	19 (54.3)	19 (24.1)	3 (33.3)	17 (35.4)	5 (33.3)	0 (0.0)	77 (29.5)	
[60-70[	6 (15.8)	12 (44.4)	5 (62.5)	12 (34.3)	19 (24.1)	1 (11.1)	15 (31.3)	6 (40.0)	0 (0.0)	76 (29.1)	
[70-80[	6 (15.8)	4 (14.8)	0 (0.0)	1 (2.9)	6 (7.6)	2 (22.2)	2 (4.2)	0 (0.0)	1 (50.0)	22 (8.4)	
[80-90[	1 (2.6)	0 (0.0)	0 (0.0)	0 (0.0)	2 (2.5)	0 (0.0)	2 (4.2)	0 (0.0)	0 (0.0)	5 (1.9)	
Total (%)	38 (14.6)	27 (10.3)	8 (3.1)	35 (13.4)	79 (30.3)	9 (3.4)	48 (18.4)	15 (5.7)	2 (0.8)	261 (100.0)	

n = Frequency; BO = Bucco-Œsophageal.
Percentages computed within each column and presented in brackets.
Pearson Chi-square test was used to compare percentages.
Statistical significance set at p-value below 0.05

Table 3. Gastrointestinal tract cancer distribution among females with respect to age

Age groups (years)	Types of gastrointestinal cancer									Total (%)	*P*-value
	Rectum *n* (%)	Pancreas *n* (%)	Intestinal *n* (%)	Stomach *n* (%)	Liver *n* (%)	Colorectal *n* (%)	Colon *n* (%)	BO *n* (%)	Unspecified *n* (%)		
[10-20[	0 (0.0)	1 (3.0)	1 (33.3)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	2 (0.9)	0.137
[20-30[	1 (2.6)	0 (0.0)	0 (0.0)	2 (5.3)	4 (9.5)	0 (0.0)	5 (13.5)	2 (16.7)	0 (0.0)	14 (6.4)	
[30-40[	5 (13.2)	2 (6.1)	1 (33.3)	5 (13.2)	7 (16.7)	1 (20.0)	7 (18.9)	1 (8.3)	3 (30.0)	33 (15.1)	
[40-50[	10 (26.3)	5 (15.2)	0 (0.0)	3 (7.9)	4 (9.5)	1 (20.0)	3 (8.1)	5 (41.7)	1 (10.0)	28 (12.8)	
[50-60[	8 (21.1)	4 (12.1)	0 (0.0)	8 (21.1)	12 (28.6)	2 (40.0)	11 (29.7)	2 (16.7)	4 (40.0)	54 (24.8)	
[60-70[	12 (31.6)	14 (42.4)	0 (0.0)	12 (31.6)	9 (21.4)	1 (20.0)	5 (13.5)	0 (0.0)	2 (20.0)	57 (26.1)	
[70-80[	2 (5.3)	7 (21.2)	1 (33.3)	7 (18.4)	5 (11.9)	0 (0.0)	4 (10.8)	0 (0.0)	0 (0.0)	26 (11.9)	
[80-90[	0 (0.0)	0 (0.0)	0 (0.0)	1 (2.6)	1 (2.4)	0 (0.0)	2 (5.4)	0 (0.0)	0 (0.0)	4 (1.8)	
Total (%)	38 (17.4)	33 (15.1)	3 (1.4)	38 (17.4)	42 (19.3)	5 (2.3)	37 (17.0)	12 (5.5)	10 (4.6)	218 (100.0)	

n = Frequency; BO = Bucco-Œsophageal.
Percentages computed within each column and presented in brackets.
Likelihood ratio was used to compare percentages.
Statistical significance set at P-value below 0.05

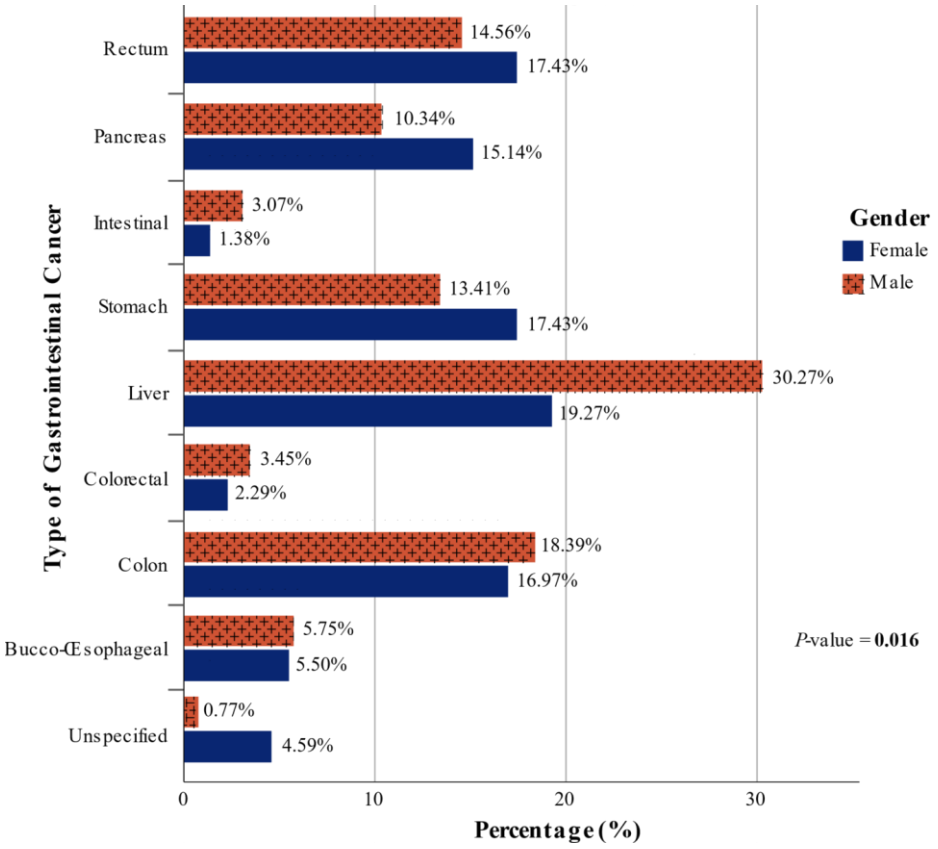

Fig. 3. Distribution of the gastrointestinal tract cancers by gender

Pearson's Chi-square test of independence was used to compare percentages of outcomes. Statistical significance was set at p-value < 0.05. We considered that Colorectal = Rectum + Colon + colorectal.

3.6 Distribution of Type of Cancer According to the Medical History

Table 4 summarises the location of GIC cases according to the medical history. Phytotherapy was practiced in 12.3%, 17.8% and 11.4% of the patients for whom the digestive cancer was located in the liver, rectum and stomach, respectively. Diabetes was found in 8.1% of patients diagnosed with pancreas cancer. The proportion of blood transfusion was above 5% in patients diagnosed with pancreas and stomach cancers (Table 4).

3.7 Profile of Gastrointestinal Cancers According to Alcohol and Tobacco Consumption

About one third (31.3%) of patients with a history of exclusive alcohol consumption were diagnosed with liver cancer. In addition, 62.5% of those with a history of exclusive tobacco use had developed liver cancer (Table 4). Among the patients who reported concomitant alcohol and tobacco consumption, the commonest cancer was colon cancer (41.7%) followed by pancreatic cancer (19.4%). A statistically significant association was found between GIC type and alcohol/tobacco consumption (*p*-value = 0.008, Phi = 0.281).

4. DISCUSSION

The aim of this work was to describe the epidemiological profile of digestive cancers among patients presenting at the Douala General Hospital and the Laquintinie Hospital in Douala, Littoral Region, Cameroon.

The results indicate a steady increase in the annual proportion of gastrointestinal cancer cases over time, with a peak (99 cases; 20.7%) observed in 2018, followed by a steady decline in cases through 2020. It is interesting to note that

Table 4. Association between location by medical history

		Main medical history							
Locations	***n****	**Phytotherapy**	**Scarification**	**Epigastralgia**	**Diabetes**	**Hemicolectomy**	**Allergy**	**Hypertension**	**Transfusion**
Liver	57	7 (12.3)	7 (12.3)	5 (8.8)	2 (3.5)	0 (0.0)	4 (7.0)	2 (3.5)	1 (1.8)
Colon	47	0 (0.0)	2 (4.4)	1 (2.1)	2 (4.4)	8 (17.0)	2 (4.4)	1 (2.2)	2 (4.4)
Rectum	45	8 (17.8)	4 (8.9)	4 (8.9)	1 (4.4)	0 (0.0)	2 (2.2)	2 (2.2)	2 (2.2)
Pancreas	37	2 (5.4)	4 (10.8)	3 (8.1)	4 (10.8)	0 (0.0)	0 (0,0)	0 (0.0)	2 (5.4)
Stomach	35	4 (11.4)	3 (8.6)	2 (5.7)	3 (8.6)	0 (0.0)	1 (2.9)	0 (0.0)	2 (5.7)

** Only locations with a sample size > 30 were presented*
Percentages are presented between brackets

Table 5. Distribution of gastro intestinal cancer types according to alcohol and tobacco consumption

Drug consumption	**Type of gastrointestinal cancer**								**Total (%)**	***P*-value**
	***BO** ***n* (%)**	**Colon** ***n* (%)**	**Colorectal** ***n* (%)**	**Liver** ***n* (%)**	**Gastric** ***n* (%)**	**Intestinal** ***n* (%)**	**Pancreas** ***n* (%)**	**Rectum** ***n* (%)**		
None	17 (5.2)	60 (18.3)	10 (3.1)	81 (24.8)	52 (15.9)	9 (2.8)	40 (12.2)	58 (17.7)	320 (70.0)	**0.008**
Alcohol only	7 (7.3)	10 (10.4)	2 (2.1)	30 (31.3)	17 (17.7)	1 (1.0)	13 (13.5)	16 (16.7)	96 (20.6)	
Tobacco only	0 (0.0)	0 (0.0)	0 (0.0)	5 (62.5)	2 (25.0)	0 (0.0)	0 (0.0)	1 (12.5)	8 (1.7)	
Alcohol and tobacco	3 (8.3)	15 (41.7)	2 (5.6)	5 (13.9)	2 (5.6)	1 (2.8)	7 (19.4)	1 (2.8)	36 (7.7)	
Total	27 (5.8)	85 (18.2)	14 (3.0)	121 (25.9)	73 (15.6)	11 (2.4)	60 (12.8)	76 (16.3)	467 (100)	

**BO = Bucco-Œsophageal; n = Frequency.*
Percentages computed within each row and presented between brackets.
Likelihood ratio used to compare percentages.
Statistical significance set at P-value below 0.05.

the majority of GIC cases in this study were observed in men (54.5%) and in patients aged 60 to 70 years (27.8%). The late onset of these diseases in elderly patients may possibly be due to the latency of cumulative risk factors prior to cancer disease onset.

Colorectal, liver, stomach, and pancreatic cancers were predominant in the study. This finding is consistent with that of previous works and the 2020 Globocan report [10]. Such group of GIC cases are becoming increasingly prevalent in African settings as seen in Nigeria [11]. Studies have also shown that the risk of colorectal cancer (undifferentiated) increases with age. After the age of 30, the risk is at least doubled every 10 years, and many authors have been able to show the prevalence of colon cancer in many countries [12,13]. Such findings may reveal the alarming state of improper food preservation or degradation of social hygiene over time in our population setting. The drop in proportion observed was quite faint, and absence of full data on yearly incidence cancer keeps this state alarming.

The data show that oral-oesophageal and intestinal cancers are lowly represented in our work. Studies pointed out that oesophageal cancer is one of the least studied cancers although it is the sixth deadliest cancer in the world due to its extremely aggressive nature and low survival rate [14,15]. The low incidence of oesophageal cancer may be due to economic gains and improved diet [16] and it was pointed out that this cancer could be related to the presence of mycotoxins in foods [17].

The distribution of GIC cases were unbalanced with respect to gender and this is line with earlier works. Plummer and colleagues found higher prevalence of certain GIC cancers in males (e.g., liver cancer) [18]. Again, we found that colon cancer was more frequent in males, consistent with large study that reported a 9-fold higher incidence rate of colon cancer in males than in females in areas of Europe, Australia/New Zealand and North America, Hungary and Norway [10]. In contrast, pancreatic, rectal and stomach cancers were more frequently seen in females. This finding is contrary to that reported by previous studies conducted in Mozambique [17,19].

GIC cases were rarely seen in young individuals (below 20 years of age) compared to elderly patients. This could be explained by the fact that the process of oncogenesis is a complex and generally time-consuming process. Some researchers have shown that in certain regions of the world cancer is increasingly found in children; but in Africa these cases are still rare compared to other continents [19,15].

As seen in males, the highest prevalence of liver and colon cancer in females was observed in the 50-60 age group while pancreatic cancer burden was highest in the 60-70 age group. On the contrary, the highest prevalence of rectal and stomach cancer in females was observed in the 60-70 age group and this could be due to a late onset of the pathology or genetic factors. On the other hand, oral-oesophageal cancer prevalence was higher in women aged 40-50 years which may be due to the increased use of oral ointments and makeup. Surprisingly, no significant association was noted between cancer types and age variation in females.

Medical history revealed that phytotherapy was practiced by patients. Cameroonian population gives an important place to traditional medicine which is sometimes accessible and also inexpensive [16], [12]. However, the use of these products could be a factor favouring the appearance or the development of these cancers.

Data on alcohol and tobacco used by individuals in the study population showed fairly high alcohol and tobacco use in colon cancer, colorectal cancer and pancreatic cancer. Alcohol consumption was highest among those with oral-oesophageal, pancreatic, colon, and liver cancers. A statistically significant association between alcohol and tobacco use in the different digestive cancers. Previous studies have shown that prolonged use of alcohol and tobacco can be risk factors for the occurrence of cancers including digestive cancers. Alcohol consumption has been linked to cancers of the oral cavity, pharynx, larynx, oesophagus, liver, colon and rectum. Again, an association between alcohol with breast, pancreas and lung cancers has been suspected in females [13].

5. CONCLUSION

The aim of this study was to describe the epidemiological profile of GIC cases at two reference hospitals of the Douala town, Cameroon. The results outlined that GIC were highly prevalent in patients aged 50-60 years and 60-70 years with predominance of colorectal,

liver, stomach and pancreas cancers. The proportion of GIC significantly varied by gender, age and alcohol/tobacco consumption. In Cameroon, GIC is an emerging public health issue especially in those aged >30 years. The knowledge of risk factors in the population would be useful for controlling their evolution in the country. It is critical to create public health strategies with the primary goal of raising public awareness and improving public health outcomes.

DATA AVAILABILITY

The data will be available upon reasonable request to the corresponding author.

ETHICAL CONSIDERATIONS

This study protocol was ethically approved by the Institutional Ethics Committee for Research on Human Health of the University of Douala (authorization n° 2879CEI-UDo/07/2021/T). In addition, administrative research authorizations were issued by the Douala General Hospital (n° 255AR/MINSANTE/HGD/DM/10/2020) and the Laquintinie Hospital Douala (n° 0317/AR/MINSANTE/DHL/CM).

CONSENT

As per international standard or university standard, patients' written consent has been collected and preserved by the author(s).

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COMPETING INTERESTS

Authors have declared that no competing interests exist.

REFERENCES

1 Soleimani A, et al. Spatial analysis of common gastrointestinal tract cancers in counties of Iran," Asian Pac. J. Cancer Prev. APJCP. 2015;16(9):4025–4029.
DOI: 10.7314/apjcp.2015.16.9.4025.

2 Grady WM, Yu M, Markowitz SD. Epigenetic Alterations in the Gastrointestinal Tract: Current and Emerging Use for Biomarkers of Cancer, Gastroenterology. 2021;160(3):690–709.
DOI: 10.1053/j.gastro.2020.09.058.

3 Shao L, et al. Risk of gastric cancer among patients with gastric intestinal metaplasia," Int. J. Cancer. 2018;143(7):1671–1677.
DOI: 10.1002/ijc.31571.

4 Kim S, et al. Growth of E. coli on formate and methanol via the reductive glycine pathway. Nat. Chem. Biol. 2020;16(5): 538–545.
DOI: 10.1038/s41589-020-0473-5.

5 Kar P. Risk factors for hepatocellular carcinoma in India," J. Clin. Exp. Hepatol. 2014;4Suppl 3:S34-42.
DOI: 10.1016/j.jceh.2014.02.155.

6 Goral V. Pancreatic Cancer: Pathogenesis and Diagnosis," Asian Pac. J. Cancer Prev. APJCP. 2015;16(14):5619–5624.
DOI: 10.7314/apjcp.2015.16.14.5619.

7 Ilic M, Ilic I. Epidemiology of pancreatic cancer," World J. Gastroenterol. 2016;22(44):9694–9705.
DOI: 10.3748/wjg.v22.i44.9694.

8 Uhlenhopp DJ, Then EO, Sunkara T, Gaduputi V. Epidemiology of esophageal cancer: update in global trends, etiology and risk factors," Clin. J. Gastroenterol. 2020;13(6):1010–1021.
DOI: 10.1007/s12328-020-01237-x.

9 Nadeem MS, Kumar V, Al-Abbasi FA, Kamal MA, Anwar F. Risk of colorectal cancer in inflammatory bowel diseases, Semin. Cancer Biol. 2020;64|:51–60.
DOI: 10.1016/j.semcancer.2019.05.001.

10 Sung H et al. Global Cancer Statistics 2020: GLOBOCAN Estimates of Incidence and Mortality Worldwide for 36 Cancers in 185 Countries, CA. Cancer J. Clin. 2021;71:3.
DOI: 10.3322/caac.21660.

11 Irabor DO, Arowolo A, Afolabi AA. Colon and rectal cancer in Ibadan, Nigeria: an update. Colorectal Dis. 2010;12(7): e43–e49, 2010.
DOI: 10.1111/j.1463-1318.2009.01928.x.

12 Mefegue FA, et al. Anti-breast cancer potential of Anonidium mannii (Oliv.) Engl. & Diels barks ethanolic extract: UPLC-ESI-QTOF-MS detection of anticancer alkaloids," J. Ethnopharmacol. 2021;276: 114131.
DOI: 10.1016/j.jep.2021.114131.

13 Rodriguez FD, Coveñas R. Biochemical Mechanisms Associating Alcohol Use Disorders with Cancers. Cancers (Basel). 2021;13(14): 3548.
Published 2021 Jul 15.
DOI:10.3390/cancers13143548.

14 Zhang Y. Epidemiology of esophageal cancer. World J. Gastroenterol. 2013; 19(34):5598–5606.
DOI: 10.3748/wjg.v19.i34.5598.

15 Steliarova-Foucher E, et al. International incidence of childhood cancer, 2001-10: a population-based registry study," Lancet Oncol. 2017;18(6):719–731.
DOI: 10.1016/S1470-2045(17)30186-9.

16 Rady I, et al. Anticancer Properties of Graviola (*Annona muricata*): A Comprehensive Mechanistic Review, Oxid. Med. Cell. Longev. 2018;1826170.
DOI: 10.1155/2018/1826170.

17 Come J, Cambaza E, Ferreira R, da Costa JMC, Carrilho C, Santos LL. Esophageal cancer in Mozambique: should mycotoxins be a concern?, Pan Afr. Med. J. 2019;33:187.
DOI: 10.11604/pamj.2019.33.187.18295.

18 Plummer M, Franceschi S, Vignat J, Forman D, de Martel C. Global burden of gastric cancer attributable to Helicobacter pylori," Int. J. Cancer. 2015;136(2):487–490.
DOI: 10.1002/ijc.28999.

19 Johnston WT, Erdmann F, Newton R, Steliarova-Foucher E, Schüz J, Roman E. Childhood cancer: Estimating regional and global incidence," Cancer Epidemiol. 2021; 71Pt B:101662.
DOI: 10.1016/j.canep.2019.101662.

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