

Clinicopathological features of gastric carcinoma in Ibadan, Nigeria, 2000-2011

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ABSTRACT

Background: The most recent study on the clinicopathological features of gastric carcinoma from the University College Hospital (UCH), Ibadan, was done in 2000. The aim of this study is to update the knowledge on the clinicopathological features of gastric carcinoma diagnosed in the Pathology Department of the UCH Ibadan between 2000 and 2011. **Materials and Methods:** This was a 12-year retrospective review of clinical and demographic data and the histopathological features of gastric cancers diagnosed at the Pathology Department of the UCH. The chi square test, Fisher's exact test, and the t-independent test were used as applicable in the statistical analyses. **Results:** A total of 117 cases of gastric carcinoma were histologically diagnosed at the Pathology Department of UCH, Ibadan in this period giving a relative ratio frequency of 1.38% for all cancers. It represented 18.4% of all gastrointestinal tract malignancies diagnosed in the same period. There was a male preponderance with male:female ratio of 1.72:1; the middle-aged and elderly made up about 77.4% of cases. The disease was clinically and histologically advanced in 92.8% of cases. Gastric tumours were predominantly antral/ pyloric in 80% of cases and exophytic in 62.3% of cases. The intestinal histotype constituted 47.0% cases although a rise in the diffuse histological type was observed. **Conclusion:** There is a decline in the relative ratio frequency of gastric carcinoma in Ibadan; and a fall in the rate of the intestinal type of gastric carcinoma relative to the diffuse type when compared to previous studies from our centre.

Key words: Clinicopathological features, gastric carcinoma, Ibadan, Nigeria

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INTRODUCTION

Gastric cancer is the fifth most common cancer in the world with about 952,000 cases reported worldwide in 2012; and the third leading cause of cancer mortality.¹ There is a wide geographical variation being highest in the Far East (Japan and China) and lowest in Africa.²⁻⁶ The age-standardised incidence range from 3.3 in West African men to 35.4 in East Asian men; and from 2.6 in West African women to 13.8 in East Asian women.¹

In Africa gastric carcinoma has a relatively higher incidence in Nigeria and South Africa than in francophone West Africa, Kenya and Egypt.³ In Nigeria the prevalence

rate is reported to be between 1.64% and 4.1% being highest in the South-West region and lowest in the North-East.^{2,3,7}

The relative ratio frequency of gastric carcinoma in the University College Hospital (UCH) Ibadan has been declining over the past decades, from 3.6% in the 1980s to 2.73% in the 1990s as found by Ogunbiyi.⁸ The most recent work on gastric carcinoma in the UCH, Ibadan by Oluwasola and Ogunbiyi in 2000 described the clinicopathological features of gastric carcinoma cases seen at the Pathology Department between 1980 and 1997.⁹ The aim of this study is to update the present data on the clinicopathological features of gastric carcinoma in UCH, Ibadan.

This study was approved by the University of Ibadan/UCH Ethics Committee.

MATERIALS AND METHODS

All the gastric carcinoma cases diagnosed at the Pathology Department, UCH, Ibadan between January 2000 and September 2011 were included in this study.

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Other non-carcinomatous neoplasms of the stomach and all the cases of gastric carcinoma whose blocks and/or slides could not be retrieved were excluded from the study.

The demographic and clinical data of the gastric carcinoma patients diagnosed in the Pathology Department, UCH, Ibadan, in the above period were retrieved from the Cancer Registry, Pathology Department records and the Medical Records of the UCH and analysed for patients' age, gender, clinical presentation, histological diagnoses including tumour types (using the Lauren classification), stage, and presence of vascular permeation and/or lymph node status. Faded slides were re-stained and reviewed. Slides of cases which could not be retrieved were prepared from the archival (formalin-fixed, paraffin-embedded) samples of same patients and reviewed to confirm the histological diagnoses, histological types, stage and lymph node status.

All statistical analyses were performed with the Statistical Package for Social Sciences (SPSS) version 19. Student's chi square test was employed to define association between variables. However, when the expected count of any variable was less than 5, the Fisher's exact test was applied. The student's t-independent test was used to compare the mean age for gender and different histologic type of gastric carcinoma. The significant value was taken as $P \leq 0.05$.

RESULTS

A total of 117 cases of gastric carcinoma were diagnosed at the UCH, Ibadan, between January, 2000 and September, 2011, accounting for 1.38% of the 8467 cases malignancies from all body systems histologically diagnosed at the Pathology Department of the University College Hospital, Ibadan. It also accounted 18.4% of the 636 cases of gastrointestinal malignancies diagnosed within the same period.

Of these 117 cases, 74 (63.2%) were males and 43 (36.8%) were females, giving a male to female ratio of 1.72:1. About 63.5% of cases occurred between 41 and 70 years and the modal age-group of occurrence was 51-60 years [Figure 1 and Table 1]. When the patients' ages were stratified into the social age-groups young (0-44 years), middle-age (45-64 years) and the elderly (65 years and above), the middle-age and the elderly accounted for 77.4% of the cases, while the young accounted for 22.6%.

The mean, median and modal ages for all cases were 53.36 ± 15.31 years, 54.00 years and 50 years respectively. The mean and median ages for the male patients were 54.0 ± 15.30 and 53.0 years respectively, while those for the female patients were 52.24 ± 15.45 and 55 years respectively. There was no statistically significant difference between the mean ages of the male and female patients ($P = 0.601$, 95% confidence interval (CI) = -4.32-7.43).

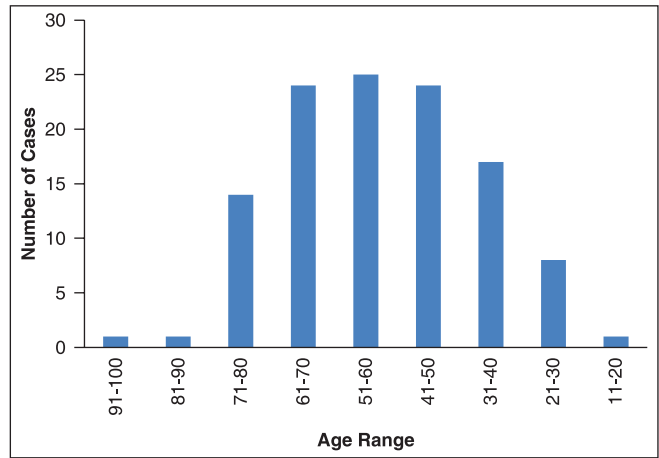


Figure 1: Bar chart showing the age distribution of gastric carcinoma patients diagnosed at the University College Hospital between the years 2000 and 2011

Table 1: Age and sex distribution of gastric carcinoma patients diagnosed at the University College Hospital between the years 2000 and 2011

Age range	Male		Female	
	No. of cases	Frequency (%)	No. of cases	Frequency (%)
11-20	1	1.4	0	0
21-30	5	6.8	3	7.1
31-40	8	10.8	9	21.4
41-50	17	23.0	7	16.7
51-60	14	18.9	11	26.2
61-70	18	24.3	6	14.3
71-80	9	12.2	5	11.9
81-90	0	0	1	2.4
91-100	1	1.4	0	0
Age not stated	1	1.4	1	2.3
Total	74	100	43	100

The modal age-group for the males was 61-70 years group while that for the females was 51-60 years [Figure 2 and Table 1]. The modal ages of the male and female groups are 50 years and 55 years respectively.

The commonest anatomical site for gastric carcinoma was the pylorus/antrum accounting for 80% (59/75 cases) of all anatomic sites, followed by the body and the fundus/cardia which accounted for 5.3% (4/75 cases) each [Table 2].

In 2.7% of cases (2/75) the tumour involved more than one site, the pylorus/ antrum and either the fundus/cardia or the body. In 6.7% of cases (5/75) the anatomical site was not known [Table 2]. There was no association between the anatomical site of tumour and patients' age ($P = 0.923$), nor between the anatomical site of tumour and the patients' gender ($P = 0.177$).

The commonest macroscopic morphology of gastric carcinoma was exophytic (62.3%, 33/53), followed by ulceroinfiltrative (22.6%, 12/53) and flat/diffusely infiltrating

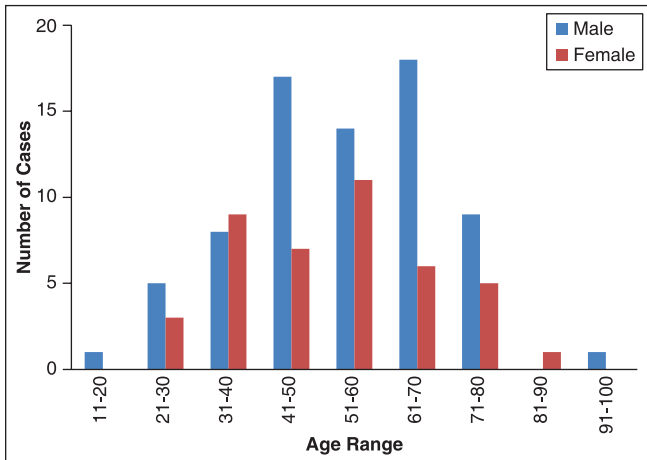


Figure 2: Bar chart showing the age distribution of male and female gastric carcinoma patients diagnosed at the University College Hospital between the years 2000 and 2011

(15.1%, 8/53) [Table 3]. No association was found between gross morphology of the tumour and patient’s gender ($P = 0.351$), age ($P = 0.805$), or anatomic site of tumour ($P = 0.262$).

The histological type of gastric carcinoma according to the Lauren classification was most commonly the intestinal type (47.0%, 55/117 cases). The diffuse type accounted for 35.1% (41/117) of cases, while the mixed/indeterminate type accounted for 17.9% (21/117) of cases [Table 4 and Figure 3]. The mean age for the intestinal histotype of gastric tumour was 51.36 ± 15.24 years, 51.94 ± 16.61 years for the diffuse and 53.67 ± 16.17 years for the mixed histotype.

There was a significant association between the histological type of the tumour and the gross morphology of tumour ($P = 0.002$). Intestinal and mixed/indeterminate tumours were more likely to be exophytic or ulcero-infiltrative than tumours with diffuse histological morphology. Conversely, tumours with diffuse histological morphology had flat/diffusely infiltrating gross morphology than either exophytic or ulcero-infiltrative appearances.

There was no significant difference in the mean ages of patients with the different histological types of gastric carcinoma [intestinal versus mixed ($P = 0.748$), diffuse versus intestinal ($P = 0.91$) and diffuse versus mixed ($P = 0.828$)]. However, the commonest histological type of gastric cancer in the female patients was diffuse (16/43) as against intestinal (15/43) and mixed/indeterminate (12/43) in the male patients.

However, when the tumours were grouped into well-differentiated (mostly intestinal) and less differentiated grades (mostly diffuse and mixed), a significant association was found between grade and gender ($P = 0.045$) [Table 5]. Tumours from the female cohorts were likely to be less differentiated than tumours from their male counterparts.

Of the 117 cases only in 69 cases could the extent of the

Table 2: Anatomic site distribution of gastric carcinoma diagnosed at the UCH, Ibadan between 2000 and 2011

Anatomic site	Number of cases	Frequency (%)
Pylorus/Antrum	60	80
Fundus/Cardia	4	5.3
Body	4	5.3
Multiple site	2	2.7
Unknown site (no clinical information)	5	6.7
Total	75	100

Table 3: Frequency of the gross morphological types of gastric carcinoma diagnosed at the UCH, Ibadan between 2000 and 2011

Morphology	Number of cases	Frequency (%)
Exophytic	33	62.3
Ultero-infiltrative	12	22.6
Flat/Diffusely infiltrating	8	15.1
Total	53	100

Table 4: Frequency of the histological types (Lauren classification) of gastric carcinoma diagnosed at the UCH, Ibadan between 2000 and 2011

Histologic type	Number of cases	Frequency (%)
Intestinal	55	47.0
Diffuse	41	35.1
Mixed/Indeterminate	21	17.9
Total	117	100

Table 5: Frequency of tumour grades of gastric carcinoma diagnosed at the UCH, Ibadan between 2000 and 2011

Tumour grade	Number of cases	Frequency (%)
Well-differentiated	54	46.2
Less differentiated	63	53.8
Total	117	100

disease be assessed from clinical records, request cards and histology reports of tumour. The disease was classified as either advanced or localised on the bases of depth of tumour invasion on histology, presence of lymph node and/or other metastases. On the basis of this classification, about 92.8% (64/69) of patients presented with advance disease. The disease was only localised in 7.2% (5/69) of cases in which the tumour was histologically limited to the mucosa or the muscularis propria. There was no significant association between the depth of invasion of the tumour and the other clinicopathological features of the tumours.

DISCUSSION

The relative ratio frequency of 1.38% of gastric carcinoma found in this study is significantly lower than the figures

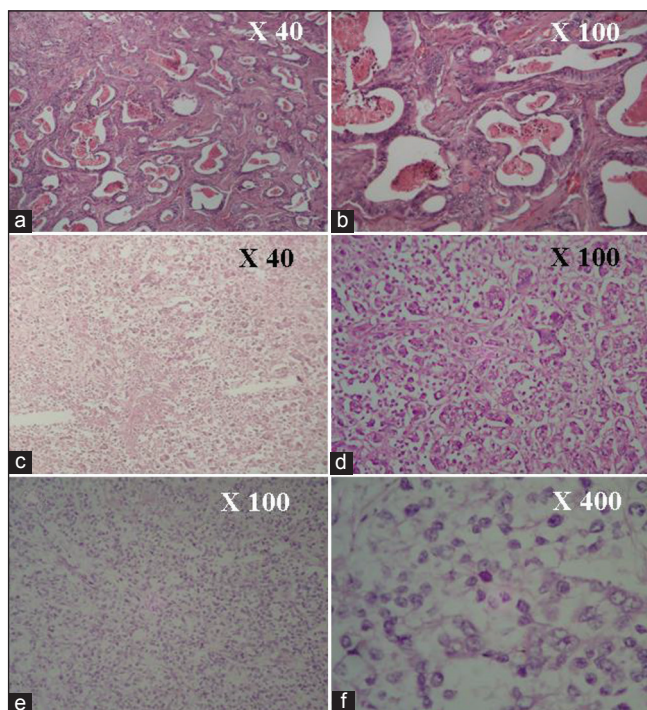


Figure 3: Photomicrograph of intestinal (a and b), mixed (c and d) and diffuse (e and f) types of gastric carcinoma (Haematoxylin and Eosin).

of 2.73% and 3.6% (for the periods 1980-1988 and 1989-1996, respectively) obtained previously from the UCH by Ogunbiyi in 2000.⁸ This reduction in frequency further supports the earlier assertion that there is a steady decline in the relative frequency of gastric carcinoma diagnosed in the Department of Pathology, UCH, Ibadan.^{3,8} This decline may be due to an increase in pathological diagnosis of tumours from other sites rather than an absolute decrease in the incidence of gastric carcinoma. This relative frequency also falls outside the national relative frequency range of 1.64% and 4.1% found in other studies across the country over three decades, although it is nearly comparable to the 1.64% reported by Abdulkareem *et al.*, from Lagos in 2010.^{2-4,7}

A rate of 18.4% for gastric carcinoma relative to other gastrointestinal tumours is somewhat higher than the 12% that was reported by Abdulkareem *et al.*, in Lagos in 2009.⁴

In keeping with the fact that gastric carcinoma is predominantly a disease of middle age and the elderly, 77.4% of our cohort were 45-years-old and above. The overall mean age of patients found in this study is similar to what had previously been reported in Ibadan and elsewhere. Furthermore, when the patients were stratified into gender the modal age for male patients was 61-70 while that for the female was 51-60. This shows a tendency for the female gastric cancer patients to be younger than their male counterparts, although the difference in the median ages between the genders was not statistically significant.

The modal age-group found in this study is similar to what was reported in 2010 from three different centres (Lagos, Maiduguri and Ile-Ife).^{2,7,10} It however, contrasts with the peak age incidences of the seventh to ninth decades obtained in studies from Japan, China, Korea, Australia, the United States and the United Kingdom.^{5,11-16} The male predominance of 1.72:1 found in this study concurs with the results of several other studies nationwide and worldwide.^{2,3,5,7,9-15,17-19}

This preponderance of pyloric/antral tumours was similarly reported by Oluwasola in Ibadan in 1998 accounting for 83.2% of gastric carcinomas in that study.¹⁸ Pyloric/antral predominance was also reported from Ife, Maiduguri, and in Iran and the United States.^{6,7,10,17,20,21}

A significant association ($P = 0.002$) was found between the macroscopic growth pattern and the histological morphology of the tumour. This association has not been previously reported in local studies, probably because it had not been sought for in these other studies, and deserves to be considered in future studies of gastric cancer from this environment.^{2,3,7,10,18,22}

The intestinal type of gastric carcinoma remains the commonest histological variant but in contrast to the rate of 56-88.7% found in previous studies, it occurs at a lower frequency of 47.0% in the present study. This difference represents a rise in the rate of the diffuse type of gastric carcinoma (35.1%) since the rate for the mixed/indeterminate histological type has remained generally constant (17-18.4%) over the past decade in Ibadan. This rise in the rate of the diffuse type of gastric carcinoma has similarly been reported in the United States over the past two decades and has been attributed to the relative fall in the intestinal type of gastric carcinoma globally.^{22,23} The fall in the intestinal type of gastric carcinoma may be due to the widespread use of anti-*H pylori* treatment regimen for dyspeptic patients with chronic gastritis and peptic ulcer as this regimen has been shown to reverse precancerous lesions like chronic atrophic gastritis and intestinal metaplasia, which are associated with *H pylori* infection.²⁴

There was also a significant association between tumour grade and the gross morphology of tumour. The flat or diffusely infiltrating tumours tended to be less differentiated than exophytic/ulcero-infiltrative tumours, while well-differentiated tumours are more likely to be exophytic/ulcero-infiltrative than flat. These associations have been classically described for gastric carcinoma. The better-differentiated gland-forming tumours typically form exophytic or ulcerated tumours, whereas, the poorly differentiated tumours composed mainly of discohesive cells, are diffusely infiltrating.²²⁻²⁵

Contrary to the report by Abdulkareem *et al.*, from Lagos in 2010, and Zheng *et al.*, from Japan in 2007 where the diffuse

histologic type of gastric carcinoma was significantly associated with the female gender; no association was found in this study between patients' gender and the histological type of gastric carcinoma ($P = 0.056$).^{2,26} However, when the different histological types were re-grouped into well-differentiated (mostly intestinal type) and less differentiated (mostly diffuse and mixed) grades, the female gender was found to associate significantly with the less differentiated tumours ($P = 0.045$). Perhaps, the use of a larger sample size may have been able to clarify true relationship between gender and the Lauren's histological type of the tumour in our centre.

Similar to reports from several centres in Nigeria as well as from Western countries and Australia.^{18,22,27} this study found that 92.8% of cases presented in advanced stage that confers poor prognosis to these tumours.^{2,3,7,10}

Although in recent times the prognosis of gastric cancer in Nigerian patients has improved significantly from the 5 year survival of 3% reported by Arigbagbu *et al.*, in 1988 to about 14% (and up to 28.1% in those who had surgery with curative intent), this retrospective study does not report the follow-up characteristics of patients.²⁸⁻³⁰ This is due to a high rate of loss of patients to follow-up as well as poor follow-up record keeping at the Medical Records Department. Under these circumstances the appropriate approach to obtain survival data for any study would have to be a prospective approach.

CONCLUSIONS

The clinicopathological characteristics of gastric carcinoma observed in this study are similar to what has been previously described except in the following regards: the lower relative ratio frequency of gastric carcinoma found in this study confirms the notion that there has been a steady, gradual decline in the relative rate of gastric carcinoma over the past three decades in Ibadan although they still make up a substantial proportion of all gastrointestinal malignancies in our centre. A rise in the diffuse histological type of gastric carcinoma, which has been reported in the United States over the past two decades, was now observed in this study.

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