

CLINICOPATHOLOGICAL STUDY OF GASTRIC MALIGNANCIES IN JOS UNIVERSITY TEACHING HOSPITAL (JUTH), JOS, NIGERIA

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ABSTRACT

Background: Gastric cancer is the 4th most common cancer and the second most common cause of cancer death worldwide. Even though notable success in the prevention and management of gastric cancer have been achieved in some regions of the world, the morbidity and mortality associated with it, still remains high throughout the world. One of the major problems associated with Gastric cancer in Africa is late presentation, which is known to be associated with severe morbidity and poor patient outcome.

Method: This study is an eight years hospital based retrospective analysis of tissue blocks and slides of Gastric malignancies seen at the histopathology department of the Jos University Teaching hospital (JUTH), between January 2005 and December 2012.

Result: Seventy nine (79) cases of malignant gastric tumours were seen within the study period. This represents 4.19% of the 1883 malignant tumours recorded within that same period. Seventy-seven cases satisfied the inclusion criteria and were included in this study. Out of the 77 cases, 67 (87%) were Adenocarcinoma, 6 (7.8%) gastrointestinal stromal tumours and one case each of carcinoid (1.3%), Leiomyosarcoma (1.3%) lymphoma (1.3%) and Hepatocellular carcinoma (a secondary). The youngest case was a 30 year old, while the oldest was 78 year old. The mean age was 54.6 years. The commonest presenting symptom was epigastric pain which occurred in 45 (58.4%) cases.

Conclusions: This study has shown that gastric malignancies are not uncommon in Jos (J.U.T.H.) and that most cases present with a late stage disease. It has also highlighted the need for endoscopic gastric cancer screening for patients around the age of 40 years or more, most especially those that presented with two or more symptoms associated with Gastric cancer.

Key words: Gastric, Cancer, Clinicopathological, Symptoms.

Introduction

Gastric cancer is the 4th most common cancer and the second leading cause of cancer associated deaths in the world.¹ In 2010 alone, there were 988,602 new cases and 737,419 deaths. In the year 2008, gastric cancer represented 7.8% of all malignancies that were reported worldwide.¹ Mabula et al. in Bugando, North western Tanzania, reported that 4.5% of all malignancies seen within the period of their study were gastric cancers.² In a study by Pindiga et al. in Maiduguri, North eastern Nigeria, gastric cancer accounted for about 4.45% of all cancers while Mandong et al. in an earlier study in Jos, North

central Nigeria reported 3.59%.^{3,4} A recent study by Abdulkareem et al in Lagos, South western Nigeria reported a rate of 1.64%.⁵

Adenocarcinoma constitute 90-95% of gastric cancers.⁶ In Bugando, Tanzania, Mabula et al. reported that 95.3% of cases seen in their study were adenocarcinomas, 1.3% lymphomas, 1.3% gastrointestinal Stromal tumours, 0.8% are metastatic tumours, while others comprising of Carcinoids, Small cell carcinoma and carcinosarcoma constitutes only 1.3%.² In Ile-Ife, South western Nigeria, Komolafe et al. reported in

2008, that 95.3% of gastric cancers were carcinomas, 2.8% Mesenchymal tumours and 1.9% lymphomas.⁷ No case of carcinoid or any other type of tumour was reported by them. The study carried out in 2010 by Abdulkareem et al. in Lagos, South western, Nigeria showed that 90% were Adenocarcinomas, 7.6% Mesenchymal, and one case each for small cell Non-Hodgkin lymphoma and carcinoid.⁵ Mandong et al. in Jos, North central Nigeria reported that 96% of cases seen in their study are Adenocarcinomas, with 5 cases of Non-Hodgkin Lymphoma and 3 cases of Leiomyosarcoma.⁴

Gastric cancer is mostly a disease of elderly people around the age of 50 and 60 years. Clarkson and West in Leicester, United Kingdom, reported a mean age of 68.6 years in their study.⁸ In similar studies by Mabula et al. in Bugando, Tanzania and Takyi et al. in Accra, Ghana mean ages of 52 and 55 years were reported respectively.^{2, 9} In Ile-Ife, South western Nigeria, Arigbabu et al. reported a mean age of 53 years, with highest number of cases occurring between ages of 41 and 60 years.¹⁰ A more recent study in the same location by Komolafe et al. in 2008, reported a mean age of 53.5 years, with most cases occurring between the ages of 50 and 59 years.⁷ Elebute et al. in Ibadan, South western Nigeria, reported that most patients were between the ages of 40 and 59 years.¹¹ No case was seen below the age of 20 years. Abdulkareem et al. in Lagos, Nigeria, reported an age range of 23 to 79 years with a mean of 55.3 years.⁵ In Zaria, North Western Nigeria, Mobogunje et al. reported a mean age of 45.2 years with a peak age incidence between the ages of 40 to 49 years.^{12, 13} Obekpa et al. in Jos, North central Nigeria, reported a mean age of 51 years.¹⁴ In all these studies no case of gastric cancer was seen below the age of 19 years.

Gastric cancer is more common in the males than females. Clarkson and West in Leicester, United Kingdom reported a male to female ratio of 2.3:1.⁸ In Bugando, Tanzania, Mabula et al. reported a male to female ratio of 2.9:1.² This was also shown by 3 different studies carried out in South western Nigeria, in Ibadan by Elebute et al., in Ile-Ife by Komolafe et al. and in Lagos by Abdulkareem et al.^{5, 7, 11} In these studies, male to female ratio were 2.6:1, 1.2:1 and 2.7:1 respectively. Osime et al. in Benin, Southern Nigeria, reported a male to female ratio of 2.3:1, while In Zaria, North western Nigeria, two studies that were carried out from the same

centre a year apart show a male to female ratio of 1.6:1 in 1978 and 1.4:1 in 1979.^{11, 13, 15} Obekpa et al. in Jos, North central Nigeria, reported a male to female ratio of 2.4:1.¹⁴ These are all in keeping with the fact that there is a male predominance in the incidence of gastric cancer. The sex ratio differences shown by these studies cannot be entirely attributed to the differences in prevalence of known risk factors between the sexes. Several studies on humans and animals have shown that oestrogen has a potential role in explaining the male predominance in gastric cancer prevalence.^{16, 17}

Most gastric cancers are seen within the pyloric antrum, and less frequently the cardia, the corpus and the fundus. Mabula et al. in Bugando, Tanzania, reported that 56.5% of cases occurred in the antrum, 12.9% in the body, 17.2% in the fundus, 8.2% diffuse and 5.2% in the cardia.² Takyi et al. in Accra, Ghana reported that 50% of cases occurred within the pyloric antrum, 8.3% the greater curvature, 2.1% within the cardia, 6.3% the entire stomach, while 33.3% were not specified.⁹ In Jos, Nigeria, Mandong et al. reported that 43.95% of the tumours seen in their study were located in the pyloric antrum.⁴ In this same study 34.1% of tumours were located within the cardia, 21.95% within the corpus and none in the fundus. Komolafe et al. in Ile-Ife, Nigeria, reported that 95.5% malignancies were seen within the pyloric antrum, while the cardia, corpus and fundus have 2.8%, 0.93% and 0.93% respectively.⁷ In a similar study by Bakari et al. in Maiduguri, Nigeria, 70.8% of cases occurred within the Antral region.¹⁸ In that same study no malignant tumour was seen within the fundus. These studies have shown that gastric cancers are commonly seen within the pyloric antrum, while the finding of gastric cancer within the gastric fundus is rare. Majority of gastric cancer patients present with late stage disease worldwide, with the exception of countries like Japan and China where mass screening for the detection of gastric cancer has been instituted. In developing countries and especially African countries, patients generally present late. In Bugando, Tanzania, Mabula et al. reported that 92.1% of cases were late stage diseases (Stages III and IV), while Bakari et al. in Maiduguri, Nigeria reported that 97% of cases seen in their study were late stage diseases (Stage III and IV).^{2, 18}

The clinical features of gastric malignancies reported with high frequencies are those of late stage diseases. This is due to late presentation of patients

with Gastric cancer to the Hospitals. In a study in Durham, USA, the common clinical features seen by Meyers et al. were: Weight loss (72%), Epigastric pain (51%), Vomiting (40%), Anorexia (35%), Cachexia (26%), Epigastric mass (17%), Dysphagia (22%), Hematemesis (11%) and Ascites (3%).¹⁹ In Bugando, North western Tanzania, Mabula et al. reported that the common clinical features seen were Epigastric mass (69.8%), Obstructive symptoms (79.3%), Metastasis (Bloomer shelves/ Krukenburg Tumour) (37.9%), ascites (27.2%) and upper GI bleeding (19.4%).² The most frequent symptoms seen by Abdulkareem et al. in Lagos, South western Nigeria were abdominal fullness (84%) followed by recurrent vomiting (63%), while Weight loss, Anorexia, and Gastrointestinal bleeding were seen in 53%, 42% and 11% of the cases respectively.⁵ Bakari et al. in Maiduguri, North eastern Nigeria reported that Epigastric pain was the commonest clinical feature (100%).¹⁸ Other common features reported by them, are Weight loss 68%, Vomiting (68.1%), Anorexia (86.1%), Epigastric mass (51.4%) and Pallor (75%). The common clinical features seen in most of these studies were; Epigastric pain, Epigastric mass and recurrent vomiting.

Gastric carcinoma is rare before the age of 30 years. It rises thereafter rapidly and steadily to reach the highest rates in the older age groups. This finding occurs both in the males and females.²⁰ Most cases are over 50 years of age, but cases in young individuals and children were also documented.⁶

The commonest type of gastric adenocarcinoma based on Lauren classification scheme is the Intestinal type adenocarcinoma. Mabula et al. in Bugando, Tanzania, reported that in 54.3% of adenocarcinoma cases seen in their study were intestinal, 25.3% diffuse, 15.8% mixed, while 4.5% were unclassifiable.² Mabogunje et al. in Zaria, North western Nigeria reported that 40% of the gastric adenocarcinoma cases seen by them were intestinal, 24.6% diffuse, 3.1% mixed and 10.8% were unclassifiable.¹² In South western Nigeria, Abdulkareem et al. in Lagos showed that 60% of the gastric adenocarcinoma cases seen in their study were intestinal type, while 40% were diffuse, giving an intestinal to diffuse ratio of 1.5:1.⁵ Komolafe et al. in Ile-Ife, Nigeria classified the adenocarcinoma cases seen in their work based on the WHO classification scheme. Tubular adenocarcinoma accounted for 35.3% while Papillary, Mucinous, signet Ring and the undifferentiated types accounted

for 13.7%, 22%, 8.8% and 21% respectively.⁷

In a study in Thailand, Chang reported that 3.4% of all gastric malignancies seen were lymphomas, 2.56% Non-Hodgkin type and 1.28% primary Hodgkin disease of the stomach.²¹ Mabula et al. in Bugando, Tanzania, reported only 3 cases of Lymphoma (1.3%).² In a study carried out in 1988 by Arigbabu in Ile-Ife, Nigeria, no case of lymphoma was reported.⁹ However in a recent study there by Komolafe et al. showed a prevalence of 1.9%.⁷ A similar study in 2010, by Abdulkareem et al. in Lagos, Nigeria reported only a case of lymphoma.⁵ Mandong et al. in Jos, Nigeria recorded 5 cases of lymphoma in an earlier study (1.5%).⁴ These show that the prevalence of gastric lymphoma in Nigeria is lower than what is seen in other regions of the world.

Gastrointestinal stromal tumours represents only 1% of all malignant tumours of the gastrointestinal tract (GIT).²² It is however the most common mesenchymal tumour of the GIT with majority (40 to 60%) arising from the stomach.^{22,23} It occurs most frequently in individuals over the age of 55 years, but the peak age of diagnosis is 60years, with far less than 10% occurring in individuals under the age of 40years.²⁴ The mean age of diagnosis in a study by Abdulkareem et al. in Lagos, Nigeria, is 45.4 years.²⁴ Several other studies showed mean age between 50 and 65.8 years. GIST accounts for 2.2% of malignant gastric tumours in SEER data. There is no significant gender predominance (M: F 1.1:1).²⁵

Materials And Methods

This was a retrospective study of all gastric cancer cases seen between January 2005 and December 2012 in the department of Histopathology Jos University Teaching Hospital, Jos. Paraffin wax embedded tissue blocks and corresponding archival routine haematoxylin and eosin (H&E) stained slides of all gastric cancer cases were retrieved and reviewed. Fresh sections were taken from blocks for all cases that required immunohistochemical staining and where original slides were missing or damaged. Patient information, clinical features, tumour site and stage are taken from, hospital histopathology investigation request forms, patient case note and duplicated copies of dispatched results. Data obtained was subjected to statistical analysis using EPI info 3.5.1 software. Results obtained from the study were presented in tables, figures, relative frequencies and group percentages.

Results

Malignant gastric tumours accounted for 79 cases, representing 28.2% of all gastrointestinal tract malignancies and 4.19% of the 1883 malignant tumours recorded in Histopathology department J.U.T.H. over the period. Seventy-seven cases satisfied the inclusion criteria in this study. These include fifty endoscopic biopsy specimen and 27 Gastrectomy specimen, out of which forty-six had adjacent non-cancerous epithelium.

Out of the 77 cases, 67 (87%) were adenocarcinoma, 6 (7.8%) gastrointestinal stromal tumours and one case each of carcinoid (1.3%), leiomyosarcoma (1.3%) lymphoma (1.3%) and hepatocellular carcinoma (a secondary). This is depicted in Table 1. The youngest case was a 30 year old, while the oldest was 78 years old. The mean age was 54.6 years. The peak age range for the cases was 51-60 years, accounting for 25 (32.5%) cases while the ages between 41 and 80 years had 47 (61.1%) cases (Table 2).

Sex distribution of gastric malignancy cases are represented in Table 3. Thirty-one (40.3%) of the cases were seen in females, comprising of 30 cases of adenocarcinomas and 1 lymphoma. Forty-six (59.7%) cases were seen in males, this include 37 adenocarcinoma, 6 gastrointestinal stromal tumours (GIST), 1 case each of carcinoid and leiomyosarcoma. One case of secondary tumour to the stomach (hepatocellular carcinoma) was also seen in a male. The male to female ratio is 1.5:1.

Gastric antrum was the commonest site with 56 (72.7%) cases, while the cardia and the corpus have 11 (14.3%) and 9 (11.7%) respectively. One case of diffuse Adenocarcinoma involved most part of the stomach wall. No case of Cancer was seen in the Fundus. (Table 4)

Adenocarcinoma accounted for 67 (87%) cases, indicating that they are the commonest gastric malignancies. Based on Lauren classification, 53 (79.1%) of the cases were intestinal while 14 (20.9%) cases were diffuse (Table 5). The mean age for the diffuse type is 52.9 years while that of the intestinal is 54.9 years, however this was not statistically significant (T statistic = 0.6147, p value = 0.5409). The male to female sex ratios are 2.5:1 and 1:1 for diffuse and intestinal types respectively. Table 5 also shows that the commonest type of adenocarcinoma based on WHO classification scheme is the tubular type with 35 (52.2%) cases. The papillary, signet ring, mucinous and the

undifferentiated types have 11(16.4%), 7 (10.4%), 8 (11.9%) and 6(9%) cases respectively.

Out of the 67 cases of adenocarcinoma seen only 18 were resection specimen. These were staged as seen in Table 10. The commonest stage was stage IV with 11(61.1%) cases while stages II and III had 3(16.6%) and 4 (22.2%) cases respectively. None of the cases seen was in stage I. (Table 6)

Tubular and papillary variants of WHO classification scheme of adenocarcinoma were graded, because other variants are not graded based on the three-tier grading system (Table 7). There were 46 cases, comprising of 35 tubular and 11 papillary Adenocarcinomas. Twenty-five (54.3%) out of the 46 were well differentiated, 18 (39.1%) moderately differentiated and 3 (6.5%) poorly differentiated.

Nine common symptoms associated with gastric cancers were evaluated. The commonest presenting symptom was epigastric pain which occurred in 45 (58.4%) cases. This was followed by recurrent vomiting 29 (37.7%), while the least occurring symptom was melena which occurred in 2 (2.6%) cases only. This is depicted in Table 8. The frequency of symptoms occurring per case was also analysed. Most cases 34 (44.2%) had two symptoms while 27 (35.1%) had 3 or more symptoms (Table 8). Logistic regression analysis was used to determine the relationship between symptoms and the likelihood of presenting with adenocarcinoma. Cases that had epigastric pain were over 5 times more likely to present with adenocarcinoma compared with those without Epigastric pain (OR = 5.6; P-value = 0.026). While those with recurrent vomiting were 10 times more likely to present with Adenocarcinoma compared to those without recurrent vomiting (OR= 9.94; P-value =0.040). Cases with combination of two or more symptoms were 11 times more likely to have adenocarcinoma compared to those with only one symptom (OR = 11; P-value = 0.040). This is depicted in Table 9.

There were 10 (12.9%) other cases of gastric malignancies apart from the Adenocarcinomas. Seven (9.0%) of them were mesenchymal tumours, 6 (7.8%) GIST and 1 (1.3%) leiomyosarcoma. The entire GISTs (4 spindle cell and 2 epithelioid) were positive for CD117/c-KIT, 5 were positive for CD34 while all were negative for SMA and Desmin. One of them was however positive also for S100. The diagnosis of leiomyosarcoma was based on histology on H & E and immunopositivity for

Desmin and Smooth muscle Actin (SMA). This same tumour was also negative for CD117, CD34 and S100. The single case of lymphoma in the study was found to be a B-cell Non-Hodgkin lymphoma. It

was positive for Leukocyte common antigen (LCA) and CD20, but negative for CD3. Immunohistochemistry was not carried out on the Carcinoid tumour seen.

Tumour type	Frequency	Percent (%)
Adenocarcinoma	67	87
Carcinoid	1	1.3
GIST	6	7.8
Hepatocellular carcinoma	1	1.3
Leiomyosarcoma	1	1.3
Lymphoma	1	1.3
Total	77	100

Table 1

Histopathological subtypes of gastric malignancies seen in J.U.T.H, Jos

Age group (years)	Male	Female	Total	%
21-30	1	0	1	1.3
31-40	3	6	9	11.7
41-50	13	7	20	26.0
51-60	14	11	25	32.5
61-70	14	6	20	26.0
71-80	1	1	1	2.6
Total	46	31	77	100

Table 2 Age and Sex distribution of gastric malignancies seen in J.U.T.H, Jos

Tumour type	Number of females	Number of males	Total	%
Adenocarcinoma	30	37	67	87
Carcinoid	0	1	1	1.3
GIST	0	6	6	7.8
Hepatocellular carcinoma	0	1	1	1.3
Leiomyosarcoma	0	1	1	1.3
Lymphoma	1	0	1	1.3
Total (%)	31(40.3)	46(59.7)	77	100

Table 3 Distribution of Histopathological subtypes of tumours seen among male and female cases of Gastric cancers seen in J.U.T.H., Jos

Tumour site	Frequency	Percent (%)
Antrum	56	72.7
Cardia	11	14.3
Complete	1	1.3
Corpus	9	11.7
Total	77	100

Table 4 Topographical distribution of Gastric cancer seen in J.U.T.H., Jos

WHO classification	Frequency	Percent (%)
Mucinous	8	11.9
Papillary	11	16.4
Undifferentiated	6	9.0
Signet Ring	7	10.4
Tubular	35	52.2
Total	67	100
Lauren classification		
Diffuse	14	20.9
Intestinal	53	79.1
Total	67	100

Table 5 Distribution of Adenocarcinoma cases seen in J.U.T.H., Jos based on the WHO and Lauren classification scheme

TNM Stage	Frequency	Percent
II	3	16.7
III	4	22.2
IV	11	61.1
Total	18	100

Table 6 Distribution of stages of gastric Adenocarcinoma cases seen at J.U.T.H, Jos

	Well differentiated	Moderately differentiated	Poorly differentiated	Not graded	Total
Tubular	19	14	2	0	35
Papillary	6	4	1	0	11
Mucinous	0	0	0	8	8
Signet ring	0	0	0	7	7
Undifferentiated	0	0	0	6	6
Total	25	18	3	21	67

Table 7 Grades of Adenocarcinoma cases seen at J.U.T.H, Jos

Symptoms	Frequency	Percent (%)
Nausea	12	15.6
Hematemesis	4	5.2
Recurrent vomiting	29	37.7
Abdominal pain	25	32.5
Weight loss	17	22.1
Epigastric mass	6	3.9
Abdominal mass	23	29.9
Melena	2	2.6
Epigastric pain	45	58.9

Table 8 Frequency of symptoms seen in Gastric cancer cases seen in J.U.T.H., Jos Table

Variables	Odds Ratio	Confidence interval	P-value
Combination of symptoms (three or more)	1.467	0.330-6.515	0.615
Combination of symptoms (two symptoms)	11.000	1.115-108.479	0.041

Table 9 Association between cases of Adenocarcinoma and combination of symptoms

Discussion

Studies on gastric cancer are very important because of the severe morbidity and high mortality associated with it. It is the 4th most common cancer and second most common leading cause of cancer death in the world. In this study gastric cancer accounted for 4.19% of all malignancies seen within the study period. This prevalence is lower than the global prevalence of 7.8%, but it is close to 4.5% reported by Mabula et al in Bugando, Tanzania.^{1,2} It is also close to 3.59% reported earlier by Mandong et al.⁴ in the same location and 4.55% reported by Bakari et al.³⁴ in Maiduguri, Nigeria respectively. However it is higher than 1.64% reported by Abdulkareem et al.⁵ in Lagos, Nigeria. This result agrees with the fact that the prevalence of gastric cancer in Jos is similar to what is obtained in other parts of the world and therefore not uncommon.

There was a predominance of adenocarcinoma in this study (87%). This is in agreement with most studies on Gastric cancer. Mabula et al.² in Bugando, Tanzania reported a prevalence of 95.3%. Komolafe et al.⁸ in Ile-Ife, Nigeria also reported 95.3%. Abdulkareem et al.⁵ in Lagos Nigeria reported a prevalence of 90% while Mandong et al.⁴ in a previous study in Jos reported 96%. This shows that majority of gastric cancers are adenocarcinomas.

There were 7 (9.1%) cases of malignant mesenchymal tumours, comprising of 6 (7.8%) gastrointestinal stromal tumours (GIST) and a leiomyosarcoma (1.3%). This corresponds to the work carried out by Abdulkareem et al.⁵ in Lagos who reported 7.6% to be tumours of mesenchymal origin. Lower prevalence was reported by Komolafe et al.⁷ in Ile-Ife (2.8%). Mandong et al.⁴ in an earlier study in Jos, Nigeria reported 3 cases of leiomyosarcoma, which were not subjected to Immunohistochemistry at that time. Two out the 6 (7.8%) cases of GIST were seen in this study were earlier diagnosed as leiomyosarcoma, without the use of immunohistochemistry. This underscores the need for immunohistochemistry in our laboratory for accurate diagnosis and management of gastric mesenchymal malignancies.

Lymphoma is less common in Africans than other races. This was further buttressed in this study in which only a case of lymphoma (1.3%) was seen. Mabula et al.² in Bugando, Tanzania reported that 1.3% of their cases are lymphoma while

Abdulkareem et al.⁵ in Lagos, and Komolafe et al.⁷ in Ile-Ife reported 1 and 2 (1.9%) cases respectively. Arigbabu¹⁰ reported no case of Lymphoma in an earlier work in Ile-Ife while Mandong et al.⁴ reported a larger figure of 5 cases in an earlier work in Jos, Nigeria.

The average age of the cases seen in this study was 54.6 years, which is lower than 68.6 years reported by Clarkson and West in the United Kingdom.⁸ It is however comparable with other studies in Africa by Mabula et al.² in Bugando, Tanzania and Takyi et al.⁹ in Ghana who reported 52 and 55 years respectively. It also concurs with the 55 years reported by Abdulkareem et al.²³ in Lagos and 53 years reported by Komolafe et al.⁷ in Ile-Ife, both in Nigeria. This study further emphasizes that gastric cancer is a disease of people within the age range of 50-60 years, for most cases were seen in people above 40 years (61.1%).

Numerous studies have shown that Gastric cancer is predominantly seen in the male sex^{2,5,7,8}. The male to female ratio in this study was 1.5:1. The male sex should be considered a significant risk factor for the development of gastric cancer especially for those above 40 years with suggestive symptoms.

Several studies have also shown that the antrum is the commonest site for gastric cancer to occur.^{2,4,7,18} This was also shown in this study were 56 (72.2%) cases occurred in the antrum. Because of this finding, endoscopy gastric biopsy should always include a sample taken from the antrum.

Lauren classification scheme of adenocarcinoma has been shown to have prognostic value with the intestinal type having better prognosis over the diffuse type. Fifty three (79%) of the cases were intestinal while 14 (20.9%) were diffuse. This showed the predominance of intestinal type over diffuse type and also concurs with several other studies in that aspect.⁵ There was no significant difference between the average ages for intestinal and the diffuse type. This is similar to what was reported by Abdulkareem et al. in Lagos.⁵ The commonest type of adenocarcinoma seen in this study based on WHO classification scheme is the Tubular type, similar to what was reported by Komolafe et al. in Ile-Ife.⁷ This further buttress the fact that tubular carcinoma is the commonest subtypes of adenocarcinoma seen based on WHO classification scheme. This classification scheme has not shown any prognostic importance.

Patients with gastric cancers present with late diseases in most part of the world with exception of countries that have instituted routine screening for gastric cancer. Only 18 (23.4%) cases in this study were resection specimen. These were staged according to AJCC/TNM system. 11 (61.1%) cases were in stage IV, but none in stage I. Fifteen (83.3%) cases were stage III and IV, similar to 92.1% of Mabula et al. in Bugando, Tanzania and 97% seen by Bakari et al. in Maiduguri, Nigeria.^{2,18} All these show that patients in this region of the world present with late stage diseases and there is a need for institutionalized screening programme for patients with risk factors.

Out of the nine symptoms evaluated in this study epigastric pain was the most frequent symptom followed closely by recurrent vomiting and abdominal pain. The frequency of cases with epigastric pain is high in most studies.^{2, 18, 19} In this study, cases that had epigastric pain are 5 times more likely to present with Adenocarcinoma than those without it, while those that presented with recurrent vomiting are 10 times more likely to present with Adenocarcinoma. This means that patients with both recurrent vomiting and epigastric pain should be screened for Gastric Adenocarcinoma. 34 (44.2%) cases had 2 symptoms and are 11 times more likely to have Adenocarcinoma. This shows that patients that are presenting with 2 or more of these symptoms should be evaluated for gastric cancer.

Conclusion

Gastric cancer remains a cause of significant morbidity and mortality worldwide. This study has shown that gastric malignancies are not uncommon in Jos (J.U.T.H.) and that most cases present with a late stage diseases. It has also highlighted the need for endoscopic gastric cancer screening for patients around the age of 40 years or more, most especially those that presented with two or more symptoms associated with gastric cancer. Also, endoscopic gastric biopsy should always include biopsies taken from the antrum, due to the fact that majority of gastric malignancies occur there. The need for the use of Immunohistochemistry and further studies to aid accurate diagnosis and treatment of Gastric malignancies was also highlighted by this study.

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