

## Epidemiology of Gastric Cancer in Jos University Teaching Hospital Jos A 20 Year Review of Cases

\*Mandong BM FMCPath \*Manasseh AN FMCPath, \*Tanko MN FMCPath\*, Echejoh GO FMCPath,  
\*\*Madaki AJK FWACP

\*Departments Pathology and \*\*Family Medicine Jos University Teaching Hospital, P M B 2076 Jos Nigeria

### Abstracts

**Background:** Gastric cancer believed to be rare in the past in Africa, is now one of the leading cancer morbidity and mortality. It is now known gastric cancer is 2-3 times higher in males than females living in the same environment. We aim to describe the comprehensive histological characteristics of gastric cancer with age and sex distribution.

**Methods:** The study site was Jos University Teaching Hospital situated in the capital of Plateau State. The hospital has a bed capacity of 530. The study materials were obtained from all stained specimens of gastric cancer recorded in the histopathology laboratory of the teaching hospital between 1985 to 2004. The biopsy site was noted. These were divided into the following groups: Cardia, body and antrum/pyloric regions respectively. Or the information included age and sex of the patients.

**Results:** There were a total of 205 gastric cancer histological confirmed, out of 5705 malignant tumours recorded in the same period. There were a total of 145 cases in male and 60 in females giving a male: female ratio 2.4:1. The highest frequencies of gastric cancers were located in the antral and cardia regions which accounted for 79% of all the tumours. Well differentiated adenocarcinoma (intestinal type) was the most frequent histological subtypes (51.2%), this was followed by poorly and diffusely infiltrating carcinoma. Other cancers included signet ring carcinoma, Non-Hodgkin's lymphoma and leiomyosarcoma in that order. The study has also demonstrated *H pylori* at the background of intestinal type adenocarcinoma which was seen in the body and antrum.

**Conclusion:** The study has shown that gastric cancer is not only common but it occur more males than females. The high proportion of *H pylori* in our environment might indicate a possible aetiological association. Therefore eradication of *H pylori* might reduce the prevalence of gastric carcinoma.

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### Introduction

Gastric cancer which is the most deadly cancer in Europe and America, is now on the decline<sup>1-5</sup>. The incidence has been reducing with advent of endoscopy in the 1960s<sup>12</sup>. In USA, the incidence is reported to have dropped from 38 to 3 per 100,000 population for men and 2.0 per 100,000 for women<sup>4,5</sup>. Japan and Iceland have probably the highest incidence of gastric cancer in the world. Scandinavian countries show the next highest incidence and are followed by UK and Latin American countries<sup>5,7,8</sup>. The incidence in USA is slightly lower than of European countries which is reported to be <3 per 100,000 population. In case control studies, it is reported to be more common in low-socio-economic group and exhibits a male to female ratio of 2:1<sup>1,2</sup>. It is more common in non-white American blacks American Indians and Hawaiians.

In African the incidence is low except for some province in Central Africa (Congo)<sup>2,3</sup>. Where as the incidence in South African white and Asian far exceeds that of USA. It is highest in coloured races in both sexes. In Nigeria, the incidence is similar to that of USA upto the age of 50 years and is then less in the older age groups<sup>2,7,8</sup>. In the Caribbean Island of Jamaica it is reported to be intermediate between the low incidence found in Africa and the moderate one in USA non white population. It therefore appears that environment rather than racial or genetic factors may be the main aetiological factors in the causes of gastric cancer<sup>2-5</sup>.

The pathogenesis of gastric cancer is largely linked with environmental risk factors. Diet is suspected to be a primary factor and adherence to certain dietary habits has been associated with increased risk of cancer.

Lack of refrigeration, consumption of preserved food with Nitrosamine compounds, smoked and salted foods, lack of vegetables and fruits constitute factors that are associated with high incidence<sup>5,6,7-10</sup>. The carcinogenic factor of hydrocarbon in grilled or smoked meat or fish had been suggested as a possible factor. Grilled meat is however, probably more widely

consumed in USA in any other country in the world, but it has been a declining incidence of gastric cancer<sup>13-15</sup>.

It has been suggested that heavy consumption of dairy products and fresh vegetable might be responsible for decreasing incidence, but in Japan, where the consumption of these products is increasing the incidence of stomach cancer is also rising<sup>3,4</sup>.

In parts of Africa, where dairy products are not widely consumed, the incidence is low. It therefore implies from the above mention observation, that not only dietary factors may be involved. Chronic gastritis association with *Helicobacter pylori* is said to increased the risk of gastric cancer in the affected individual by 5-6 fold compared to subjects without gastritis<sup>13-16</sup>.

The study, therefore describes the comprehensive histological characteristic of gastric cancer, with the age of sex distribution.

## Material and Methods

The study site Jos University Teaching Hospital a tertiary health centre receives specimens from most of the North central state of Nigeria. Biopsy samples were obtained from all stained specimens of gastric cancers recorded by the cancer registry between 1985 and 2004. The biopsy sites were noted. These were divided into the following groups cardia, body and antrum/pyloric regions respectively. Information collected from clinical referral forms included, age and sex. The histological distribution was done according to W.H.O. 1977. Histologic classification of gastric tumours. The data was then analysed.

## Results

A total of 205 gastric cancers were histologically confirmed out of 5,703 malignant tumours recorded in the same period. This represented 3.59% of total cancer within the same period.

There were a total of 145 cases in males and 60 cases in female giving a male female ratio 2.4:1.

The table I shows the distribution of gastric cancer by age and sex. There is a clustrering of cases between the ages of 35 and 65 years. The highest frequency in the 56-65 years of age group, males being significantly more affected than females. The male female rate for each category was 2.5:1.

Table II shows the site of gastric cancer. In both sexes cardia and pyloric regions accounted for the highest proportion of cases.

Table III showed histological distribution of cancer. Intestinal type adenocarcinoma was mainly located in cardiac and pyloric regions which accounted for 51.2% of total histological subtypes. The diffusely infiltrating non cohesive cells were mainly located in the body and cardiac counting for 34.1%. Five cases of Non-Hodgkin's lymphoma were seen and were located at the body and cardiac regions. Of the 205 gastric cancers only 10 were early gastric lesions which were diagnosed on endoscopy. The 195 were advanced cancers beyond lamina propria.

Table I: Age and Gender distribution of Gastric cancer

Age (yrs)	<25	26-35	36-45	45-55	56-65	66-75	Total
Male	3	5	30	40	53	14	145
Female	1	3	13	18	23	2	60
Total	4	8	43	58	76	1	205

Table II: Location gastric cancer in the stomach

Anatomic site	Males	Femalest	Total	Percent of Total
Cardia	45	25	70	34.1
Body	35	10	45	21.95
Antrum/pyloric	65	25	90	43.95

Table III Histological subtype/location in the stomach

S/No		Cardia	Body	Pyloric	Total No	
1	Well differentiated adenocarcinomas	45	10	50	105	51.2
2	Poorly different iated carcinoma	16	51	3	70	34.1
3	Signet ring carcinoma	5	13	4	22	10.7
4	Non-hodgkins lymphoma	2	3	-	x	1.4
5	Liomyosarcoma	2	1	-	x	1.5
	Total	70	78	57	205	

## Discussion

Gastric cancers thought to be rare in the past, have now become one of the major cancers in developing countries like Nigeria (1-5).

In the present study, gastric cancer accounted for 3.59% of the cancers in the 20 year period. Similar studies in Ibadan, Western region of Nigeria showed a proportion of 4.45%. In Maiduguri North Eastern Nigeria it was 3.4% and a former study in North central Nigeria reported a figure of 3.2%. The male to female ratio was 2.4:1. This figure compares favourably with report from Ibadan (2:1) and Maiduguri (1.5:1). In other parts of the world, the ratio of male to female have been reported to be 2.4:1 in Japan, UK 2.6:1, USA 2.5:1 (4,5,9,10). This analysis shows that gastric cancer is predominantly found in males. The lowest ratio reported was from South American with male female ratio of 1.5:1<sup>5,14,15</sup>.

The distribution of gastric cancer with cardia and non-cardiac region shows that gastric cardia cancers accounted for 34.5% of the gastric cancer. In this study, cardia gastric cancer in males were 45 which accounted for 21.8% of total gastric cancer. In similar studies conducted in Japan 4% was reported, which in USA 39% was reported in whites males. Male female ratio in these countries were between 3:1 to 6:1<sup>4,5,13</sup>. Reports from countries Europe and America show that gastric cardia cancer is on the increase<sup>4,5</sup>. Recent investigation

of the cause suggested that two factors are of importance. For decades Barrets oesophagus, a complication of reflux eosophagitis, has been regarded as having unquantified malignant potential and a recent Swedish study showed a strong link between reflux and adenocarcinomas of gastric cardia and lower oesophagus<sup>14,15</sup>. In view of the association between obesity and reflux and cancer of lower oesophagus and cardia, there is no strong links. However, there are trend related to diet which may be relevant. A further report from a Swedish study has shown a strong inverse relationship between cardia cancer and dietary fibre intake. This is not surprising since African diet is predominantly a large fibre diet<sup>23</sup>.

Non-cardia (pyloric antrum) cancer was more common in male than female with male female ratio of 3:1. This is similar with cohort study conducted in USA and New Zealand. In these centre there was preponderance in whites in USA and non-white in new Zealand.

In respect of histological pattern of gastric cancer, the cardia and body shows predominantly well differentiated adenocarcinomas, (intestinal type) while diffused and signet ring carcinoma were predominantly in body of the stomach. The pathogenesis of gastric adenocarcinomas is centered on H Pylori, diet rich in nitrites and nitroamines. Since the H. Pylori was first reported by Marshal in 1983, subsequent studies have been gathered which demonstrated its relationship with gastric cancer<sup>16,18</sup>. In 1994, the international agency for research on cancer classified H. pyloric as

carinogenicin humans<sup>18</sup>. Chronic H. pylori gastritis has been demonstrated to increased the risk of gastric cancer by 10 fold<sup>17-19</sup>.

In this twenty year study, only 5- cases of Non-Hodgkin's lymphoma were recorded. All the non-Hodgkin's lymphoma were of B-cell origin. There has been a strong association between H. pylori infection and gastric non-Hodgkin's lymphoma<sup>20,21</sup>. Complete regression has been recorded in patients who had H. pylori eradicated<sup>20,22</sup>.

Other risk factors associated with gastric cancer, include peptic ulcer, radiation, fruits vegetable and alcohol<sup>17,23</sup>.

In conclusion, although much is known about the causes of gastric cancer much is still shrouded in mystery. The study demonstrated that gastric cancer is 2-3 times more common in males than female.

The study also demonstrated that a high proportion of gastric cancers occurred in the region of the cardia. High proportion of the cancer in the body and another might reflect H. pylori infection which is associated with chronic gastritis and gastric cancer. It may be possible, to reduce the incidence of cancer of stomach by eradicating H. pylori infection.

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