Gastric Neoplasm: A Clinicopathological Study in the Tertiary Care Center of Nepal

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ABSTRACT

Background

Gastric carcinoma is the commonest upper gastrointestinal malignancy contributing to global burden of cancer morbidity and mortality.

Objective

The objective is to study distribution of the gastric neoplasm according to age, sex, symptom, gross appearance, histological type and degree of differentiation.

Method

This was a retrospective study done from January 2022 to December 2023 in the Department of Pathology, Dhulikhel Hospital - Kathmandu University Hospital (DH - KUH). Relevant clinical data of the patients were obtained from the histopathological records of the patient from the pathology department and biopsies stained with Haematoxylin and Eosin were studied under the light microscope.

Result

A total of 40 cases of gastric neoplasm were studied out of which 36(90%) were malignant and 4(10%) were benign epithelial tumors and precursor lesions. Most frequent presentation was dyspepsia, abdominal pain, vomiting, dysphagia, anemia, anorexia and weight loss. Male to female ratio was 1.4:1. The age of the patient ranged from 33 to 89 years with mean age of 63.3 ± 13.4 years. Most common site of gastric neoplasm was pyloric antrum. Ulceroproliferative growth was most common gross morphology. Malignant neoplasm were more common. Intestinal type adenocarcinoma consisted of 28 (70%) cases followed by diffuse type 6 (15%) and mixed type 1 (2.5%). Diffuse adenocarcinoma was more common in females. Moderately differentiated adenocarcinoma was the most common differentiation.

Conclusion

The present study provided a fair insight into the clinciopathological features of gastric neooplasm in our institution.

KEY WORDS

Adenocarcinoma, Diffuse type, Gastric, Intestinal type

INTRODUCTION

Gastric cancer (GC) is the commonest upper gastrointestinal (UGI) malignancy and forms the fifth most common cancer worldwide. It is the second most common cause of cancer related death.[1] The incidence of GC varies significantly by country and area, with the highest rates found in Eastern Europe, East Asia, and portions of Central and South America.[2] According to a study based on cancer registries at various hospitals, GC is the second most frequent cancer in Nepal that kills men after lung cancer.[3]

The genesis of GC is caused by a combination of environmental and genetic risk factors.[4] In Nepal, stomach cancer is becoming increasingly common among populations from lower socioeconomic backgrounds as the incidence of Helicobacter pylori bacteria is higher in these group.[5] Atrophic gastritis, intestinal metaplasia and pseudopyloric metaplasia has increase risk of GC.[5]

Endoscopy is an initial procedure used to visualize inside of the stomach and used in assessment receiving the biopsies from the suspected cases and is the preferred method for early diagnosis.[6] Histopathological evaluation of the biopsies is gold standard in diagnosing the neoplastic lesion and is useful to identify the prognostic factors in resected specimen. Prognosis of the patient primarily depends upon the TNM stage along with other factors like as histological grade, type and molecular profile.[4,5]

The aim of this study was to evaluate the gastric neoplasm diagnosed histologically in correlation with age, sex, clinical features, location, endoscopic gross findings and microscopic differentiations.

METHODS

This retrospective study was carried out in the Department of Pathology, Dhulikhel Hospital, Kathmandu University Hospital (DH KUH). Ethical approval from the Institutional Review Committee was obtained. This study included data collected over a period of 2 years, from January 2022 to December 2023. All gastric specimen that were histopathologically diagnosed as gastric neoplasms, both benign as well as malignant were included. All the gastric biopsies endoscopic biopsies and resection specimens were reviewed. The total enumeration method was used and consequently, the relevant clinical data which consisted of information regarding age, sex, clinical presentation, endoscopic findings including site and gross appearance were obtained from the histopathological records. All specimens were fixed in 10% formalin. Gross examination was done and sections were taken from representative areas then processed into paraffin embedded sections and stained with Hematoxylin and Eosin. These Hematoxylin and Eosin stained slides were retrieved for microscopic examination. The malignant tumors were histologically classified according to Lauren Classification and adenocarcinoma were histologically graded based on the extent of glandular differentiation. Frequency of various benign and malignant tumour was listed. Patient's data was entered in Microsoft Excel and descriptive data analysis was done using Statistical Package for Social Sciences (SPSS) 16.0 software. The descriptive analysis (mean, median, and percentage) was calculated.

RESULTS

A total of 1910 gastric biopsies were received in department of pathology at DH KUH. This represented 18.9% of the entire surgical specimen that were received during the study period. Out of the total received gastric biopsies 40 (2.1%) were neoplastic and 1870 (97.9%) were non-neoplastic lesions. Among the neoplastic lesions, 36 (90%) were malignant and 4 (10%) were benign epithelial tumors and precursor lesions. Most frequent presenting complaints with gastric neoplasm were dyspepsia, abdominal pain, vomiting, dysphagia, anemia, anorexia and weight loss.

The number of male and female patients with gastric neoplasm were 23 (57.5%) and 17 (42.5%) respectively. Male to female ratio was 1.4:1. Maximum number of gastric neoplasm was in 7th decade consisting of 13 (32.5%) cases followed by 8th decade and 6th decade with 8 (20%) and 7 (17.5%) cases respectively. The youngest patient was 33 years old and the oldest was 89 years old with mean age of 63.3 ± 13.4 years.

Most common site of gastric neoplasm was pyloric antrum comprising of 28 (70%) cases which was followed by the corpus and cardia with 5 (12.5%) and 4 (10%) cases each. Greater and lesser curvature were least common site comprising of 1 (2.5%) case each. One case involved both corpus and pyloric antrum.

The most common endoscopic gross morphological presentation of malignant gastric neoplasm was an ulceroproliferative growth consisting of 15 (41.7%) cases, followed by proliferative, ulcerative and infiltrative type with 11 (30.5%), 6 (16.7%) and 3 (8.3%) cases respectively. Polypoid gross appearance was the least common type with 1 (2.8%) case. Among the four benign epithelial tumors and precursor lesions two were polypoid and two were flat lesions.

Malignant gastric neoplasm consisted of 35 adenocarcinoma and 1 lymphoma. Lauren classification was used to classify the histological type of adenocarcimona. Among the adenocarcinoma maximum were intestinal type consisting of 28 (70%) cases followed by diffuse type 6 (15%) and mixed type 1 (2.5%).

Intestinal type adenocarcinoma was more common in 7th decade of life followed by 8th and 6th decade of life respectively. Male to female ratio was 1.2:1. Diffuse type adenocarcinoma was more common in 5th and 7th decade of life. It was more common in females with male to female

Table 1. **Age group and gender wise distribution of different histological types of Gastric neoplasm**

Age group	Intestinal type, carcinoma		Diffuse type, carcinoma		Mixed type, carcinoma		Lymphoma		Gastric dysplasia		Gastric adenoma		Total
	M	F	M	F	M	F	M	F	M	F	M	F	
31-40				1									1
41-50		3	1	1			1						6
51-60	4	1							1			1	7
61-70	5	4	1	1						1	1		13
71-80	4	3		1									8
81-90	2	2			1								5
Total	15	13	2	4	1		1		1	1	1	1	40

ration of 1:2. A youngest patient of gastric neoplasm was a female with diffuse adenocarcinoma. A single case of mixed type adenocarcinoma was present in a 83 years male. Diffuse large B cell lymphoma was diagnosed in a 43 years male.

Adenocarcinoma were histologically graded using the American Joint Committee on Cancer (AJCC) 8th edition system based on the extent of glandular differentiation. Moderately differentiated adenocarcinoma was the most common with 14 (40%) cases followed by poorly differentiated adenocarcinoma and well differentiated adenocarcnoma consisting of 13 (37.1%) and 8 (22.9%) cases respectively.

Two cases of gastric dysplasia were identified. One case of high grade dysplasia was seen in 70 years female and a case of low grade dysplasia in 53 years male. Two cases of gastric adenoma, low grade were present in a 54 years female and 62 years male. The distribution of gastric neoplasm according to age group and gender is shown in table 1.

DISCUSSION

Gastric proliferative epithelial lesions can be non-neoplastic (benign polyps), non-invasive neoplastic lesions consisting of dysplasia and adenoma, and carcinoma.[5,7] Neoplastic gastric lesion more likely to be malignant.[8] Gastric carcinoma is the commonest upper gastrointestinal malignancy (UGI) malignancy and its incidence of GC varies significantly by country and area, with the highest rates found in Eastern Europe, East Asia, and portions of Central and South America.[2]

Various environmental and genetic risk factors are associated with GC, the most significant ones are: smoking, drinking, eating salted and smoked foods, having helicobacter pylori infection, anemia, intestinal metaplasia, chronic atrophic gastritis, Peutz-Jeghers syndrome, li-fraumeni syndrome, and hereditary diffuse gastric cancer syndrome.[4] In Nepal, stomach cancer is becoming increasingly common among populations from lower socioeconomic backgrounds who more likely to be affected since the incidence of Helicobacter pylori bacteria is higher in this population.[7]

Endoscopy is a initial procedure used to visualize inside of the stomach and used in assessment receiving the biopsies from patients presenting with variable upper GI symptoms.[6] In our study the most frequent presenting complaints with gastric neoplasm were dyspepsia, abdominal pain, vomiting, dysphagia, anemia, anorexia and weight loss.

Male were affected more with gastric neoplasm than females with male to female ratio of 1.4:1. Similar male predominance was seen in study done by Al-Samawi et al., Neetha et al., Bhattarai et al., Manasa et al.[2,8,9,10] Although the precise physiological process remains unknown, it has been proposed that female hormones may lower the incidence of stomach cancer.[11] Also, males have more regular exposure to environmental carcinogens like cigarettes making carcinoma more prone in them.[11]

In our study, the age of patients ranged from 33 to 89 years with a mean age of 63.3 ± 13.4 years. Maximum number of gastric neoplasm were in 7th decade consisting of 13(32.5%) cases followed by 8th decade and 6th decade with 8(20 %) and 7(17.5%) cases respectively. Our finding is in accordance with studies done by Bhattarai et al., Ghosh et al., Das et al., Mir et al. and Barad et al. where the majority of cases were in 7th decade of life.[9,12-15] The mean age reported in our study agrees with data observed in studies conducted by Koirala et al., Bhattararai et al., Das et al. and Mir et al. who stated a mean age of 59, 58, 57 and 63 years respectively.[7,9,13,14] In general GC occurring below 45 years of age is called early onset gastric cancer.[2] Gastric neoplasm in young population < 40 years comprised of 2.5% in our study which is similar to findings of Shun et al.[16] Different studies showed variation in involvement of young population from as low as less than 1 to as high as 20.9%.[14,17] This may be due to impact of environmental and genetic factors on the prevalence of gastric cancer.

The most frequent site of gastric neoplasm was distal stomach, the pyloric antrum comprising of 28 (70%) cases which was followed by the corpus and cardia in current study. Similar to our findings pyloric antrum was the commonest site observed in various other studies.[8-10,12-15] In the current study, the most common endoscopic gross morphological presentation of malignant gastric neoplasm was an ulceroproliferative growth, followed by

proliferative, ulcerative and infiltrative type. Similar to our finding, ulceroproliferative growth was commonest gross presentation in study carried out by Qurieshi MA et al.[18] However, ulcerative type gross presentation was commonest type in study carried out by Bhattarai et al.[9]

World Health Organization (WHO) has classified tumors of stomach into benign epithelial tumors and precursors, and malignant epithelial tumors.[5] Benign epithelial tumours consists of intraepithelial neoplasia and adenomas of high and low grade dysplasia.[5] The risk of malignancy in them is related to their size, degree of dysplasia and villosity of the pattern of growth in case of adenoma.[5,8] In this study, among the neoplastic lesions 4 (10%) cases were benign epithelial tumors and precursor lesions. Similar to our study Neetha Y et al had 9.1% of cases of benign epithelial tumors and precursor lesions.[8]

Among the 36 malignant lesions in our study, 35 were malignant epithelial tumours. For classification of GC various systems have been proposed. Different classification system includes; Bormann's classification (1926) based on gross morphology; Stout's classification (1953) based on both gross morphology and histology; Lauren's classification (1965) based on histology; Ming's classification (1977) based on gross morphology.[5] In 2000, World Health Organization proposed a classification based on both gross morphology, histology, degree of differentiation and prognosis.[8]

According to Lauren Classification two distinct histological types of gastric adenocarcinma s including intestinal and diffuse type was described.[8] Microscopically, intestinal type shows glandular, solid, intestinal and tubular architecture. The diffuse type shows infiltrating single or poorly cohesive. When intestinal and diffuse component are equal in amount in is categorized as mixed type.[5,8] Among the adenocarcinoma maximum were intestinal type consisting of 28(70%) cases followed by diffuse type 6(15%) and mixed type 1(2.5%). Similarly studies done by Bhattarai et al., Manasa et al., Ghosh et al., Sethi et al. and Saha et al. also showed intestinal type to be the predominant one.[9,10,12,19,20] (Table 2) However the frequency of intestinal type was relatively higher in our study compared to other. This can be due to higher occurrence of H. Pylori infection in our patients who come from the lower socioeconomic strata of developing country.

Intestinal type of carcinoma was most commonly seen in the 7th decade in our study. Similar findings was noted by Manasa et al., Male to female ratio was 1.2:1 which is comparable with studies by Manasa et al. Lopez-Carrillo et al. and Sipponen et al.[10,21,22] In our study diffuse type adenocarcinoma was more common in 5th and 7th decade of life. Age specific trend in our study is in correlation with studies by Lopez-Carrillo et al. and Sipponen et al. which showed age of 50.8 ± 15 yrs and 59 ± 10 years respectively.[21,22] Diffuse carcinoma was more common in females with male to female ratio of 1:2. Similar female predominance was noted by Lopez-Carrillo et al., Sipponen et al. and Stemmermann et al.[21-23]

Table 2. Comparision for Lauren Classification of gastric carcinoma

Lauren Classifica-tion	Intestinal (%)	Diffuse (%)	Mixed (%)
Sethi et al.[19] (n=61)	62.3	31.1	6.6
Gosh et al.[12] (n=397)	53	31	16
Manasa et al.[10] (n=83)	78.3	22.7	None
Saha et al.[20] (n= 462)	53.6	31.1	15.1
Bhattarai et al.[9] (n=64)	56.3	25	18.7
Present study (n=35)	80	17.1	2.9

Histological grading ofadenocarcinoma was based on the extent of glandular differentiation.[5] A, Grade 1, Well differentiated tumour consists of more than 95% of tumor c omposed of glands; Grade 2, Moderately differentiated tumour consists of 50% to 95% of tumor composed of glands and Grade 3, Poorly differentiated tumour consists of 49% or less of tumor composed of glands.[5] In our study 40% of adenocarcinoma were moderately differentiated followed by poorly differentiated and well differentiated adenocarcinoma. Similar to our study Ghiţă et al. had 40% of moderately differentiated adenocarcinoma.[24] However, different studies have poorly and well differentiated adenocarcinoma to be the commonest differentiation.[4,15,18] The differentiation of the tumour may vary as our cases mostly included the endoscopic biopsies and the degree of differentiation may change on examination of excised specimen.

In our study a lymphoma was the second most common malignancy after adenocarcinoma and comprised of 2.8% of malignant gastric neoplasm. In concordance to our study lymphoma were commonest malignant neoplasm next to adenocarcinoma various studies with the frequency range of 1.3% to 6.2%.[8,13,14,17]

CONCLUSION

The present study provided an insight into the clinciopathological features of gastric neoplasm in our institution. Most frequent clinical presentation was dyspepsia, abdominal pain, vomiting, dysphagia, anemia, anorexia and weight loss. Most common gross appearance of was ulcer proliferative growth. Gastric neoplasm was more common in male and 7th decade was the most common age group affected. Pyloric antrum was the most frequent site for gastric carcinoma. Our study has some obvious drawbacks like short period of study, retrospective type and small sample size. A prospective study with longer duration and including the clinical and histological risk factor can contribute to the better understanding of gastric carcinoma.

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