Comparative Study of Gastric Wash Cytology and Gastric Biopsy in Various Gastric Malignancies

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ABSTRACT

INTRODUCTION: Gastric cancer is one of the most common causes of cancer mortality worldwide including Nepal too. According to World Health Organization (WHO) Helicobacter pylori (H. Pylori) has been shown to induce the development of adenocarcinomas. Histological confirmation of stomach cancer or the presence of H. pylori infection on tissue sample is still considered the gold standard.

METHODS: This was a prospective observational study conducted in 36 patients with suspicious lesion on endoscopy and gastric wash cytology and biopsy were taken simultaneously in the same sitting within a time span of one year at Bir Hospital. The location, morphological type of the lesion and association of H. pylori was looked for in all the cases.

RESULTS: Cytological smears were positive for 9 cases (25%) and helicobacter pylori positive was seen in 10 cases (27.78%) in gastric biopsies. Males were predominant with 24 cases (66.67%) and the most common age was sixth and seventh decades with 9 cases (25%) each. Most of the gastric cancers were adenocarcinomas in 33 cases (91.67%) followed by 2 cases (5.55%) of lymphoma and one case (2.78%) of signet ring carcinoma.

CONCLUSION: Gastric cancer is the third most common cause of cancer mortality worldwide behind only lung and breast cancer. The wash cytology preceding gastric biopsy yield poor results and if gastric cytology is to be good modality for diagnosing gastric malignancy it would have to be augmented by brush and aspiration techniques as well.

KEY WORDS: Cytology, Gastric cancer, Helicobacter pylori, Histopathology.

INTRODUCTION

Gastric cancer is a disease in which the cells forming the inner lining of the stomach become abnormal and start to divide uncontrollably. It is among the most common causes of cancer mortality worldwide. In Nepal too it is among the most common cancers and incidence is growing due to early detection. In our hospital which is a tertiary care centre, the preferred specimens from the upper gastrointestinal endoscopies are biopsy specimens. Many possible cytology texts or atlases have only the barest mention of gastric cytology, with its rich, varied and sometimes difficult pathology, by applying best sampling techniques (i.e. disposable endoscopic brushes and endoscopic fine needle aspiration cytology), and considering carefully the appropriate clinical questions to be answered; for each region of the stomach, clinical enthusiasm can be generated and sometimes answered more completely than with other available techniques alone, including biopsy.

H. Pylori is a spiral shaped, microaerophilic, gram negative bacterium measuring approximately 3.5 microns in length and 0.5 microns in width. According to World Health Organization (WHO) H. pylori has been shown to induce the phenotypic changes leading to development of adenocarcinomas (i.e. mucosal atrophy, intestinal metaplasia and dysplasia). Although the diagnosis of H. pylori can usually be established during endoscopy by one of these methods, biopsy urease test, histology and less commonly bacterial...
culture, in our setting histology is the only modality we can use to do so. Many physicians and surgeons still consider histological confirmation of stomach cancer or the presence of H. pylori infection on tissue sample as the gold standard. In Nepal, association of H. pylori has been found in significantly higher number of duodenal and gastric malignancies. Therefore, this study will analyze the prevalence and association of H. pylori and gastric cancers in the hope that it will help to shed more light on the role of H. pylori as the cause of gastric cancer in Nepal.

METHODS

This was a Prospective hospital-based cross sectional analytical study done at Bir Hospital, Kathmandu, enrolled thirty six patients with suspected gastric malignancy who underwent upper GI endoscopy within a period of one year. All the patients with suspected gastric malignancy who underwent upper GI endoscopy and in which gastric wash and biopsy were performed were included in the study and the patients in which upper GI endoscopy could not be performed and patients below 15 years of age were excluded.

The gastric wash specimens were collected prior to biopsy, processed and stained with May-Grünwald-Giemsa (MGG) and Papanicolaou (Pap) in the Department of Pathology, NAMS, Bir Hospital. Similarly, gastric biopsies were stained with Hematoxylin and Eosin (H&E) and MGG.

The macroscopic appearance of gastric malignancy in endoscopy has been categorized according to Borrmann’s classification as polypoid, ulcerative, infiltrative and fungating.

RESULTS
Table 4. Types of lesions in endoscopy (according to Borrmann’s classification).

<table>
<thead>
<tr>
<th>SN</th>
<th>Type</th>
<th>Total Cases (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Ulcerative</td>
<td>11 (30.56)</td>
</tr>
<tr>
<td>2</td>
<td>Fungating</td>
<td>12 (33.33)</td>
</tr>
<tr>
<td>3</td>
<td>Polypoid</td>
<td>5 (13.89)</td>
</tr>
<tr>
<td>4</td>
<td>Infiltrative</td>
<td>4 (11.11)</td>
</tr>
<tr>
<td>5</td>
<td>Ulcerative and Fungating</td>
<td>4 (11.11)</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>36 (100)</td>
</tr>
</tbody>
</table>

Table 5. Distribution of H. pylori in gastric biopsies in this study.

<table>
<thead>
<tr>
<th>SN</th>
<th>H. pylori</th>
<th>Number (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Positive</td>
<td>10 (27.78)</td>
</tr>
<tr>
<td>2.</td>
<td>Negative</td>
<td>26 (72.22)</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>36 (100)</td>
</tr>
</tbody>
</table>

DISCUSSION

Gastric cancer is the third most common cause of cancer mortality worldwide behind only lung and breast cancer. Although there has been a decline in gastric cancer incidence in developed countries over the last several decades, gastric cancer still accounts for over 10 percent of annual cancer deaths. A study done by Hart AL et al. in India, Nepal, Pakistan, Bangladesh and Bhutan concluded that Nepal had the highest and Pakistan the lowest numbers of gastric cancers. According to the study done by VS Binu et al. in the western part of Nepal stomach cancer was the third leading malignancy (9%) among males while it was fourth most common malignancy in females (7.2%). In this study total participants were 36 with male predominance of 24 cases (66.67%) and the females constituted 12 cases (33.33%). Rino et al. have conducted the research on total 43 patients with 26 males and 17 females, with a mean age of 62.5 years.

The sixth and seventh decades were most commonly affected group that comprised 9 cases (25%) each. The least common decade affected by gastric malignancy was the ninth decade with only 1 case (2.78%) (Figure 2). Caputo et al. have conducted a research on H. pylori and gastric cancer. The incidence of infection in between 1988 and 1998, 60 patients with diagnosis of gastric adenocarcinoma, forty-one were males and 19 females with an average age of 62 years (range 36-79). In this study Histopathology showed malignancy in all the 36 cases (100%) but gastric cytology was positive in only 25% of the total participants (Table 1).

The adenocarcinoma was the most common type of gastric malignancy in this study with prevalence of 33 cases (91.67%) followed by lymphomas which comprised 2 cases (5.55%) and signet ring carcinoma with 1 case (2.78 %) (Table 2).

According to Lauren’s classification of gastric adenocarcinomas, intestinal type comprised 20 cases (60.61) followed by diffuse type which comprised 13 cases (39.39%) (Table 3). Similar to this study the data shown by the Chambers et al. have found around 74% of the malignancy as adenocarcinoma in their study. The adenocarcinoma has been found to be most common malignancy in gastric carcinoma. According to the study by Caputo et al. between 1988 and 1998, out of 62 cancers Lauren’s criteria showed 39 cases (65%) as intestinal type, 16 cases (27%) as diffuse type and five (8%) as mixed type.

Exfoliative cytology plays an effective diagnostic role in cancer of the gastrointestinal tract and should be used more frequently by gastroenterologists, who, however, should be aware of the risk of false-positive results.

The fungating type was the most common endoscopic findings of the gastric malignancies (according to Borrmann’s classification) in this study that comprised 12 cases (33.33%) (Table 4). Antrum was found to be most common site for gastric malignancy with 18 cases (50%) (Figure 3). According to the study done by Caputo et al. 65% between 1988 and 1998, 60 patients with diagnosis of gastric adenocarcinoma twenty-seven cancers (45%) were localized in the lower third of the stomach, 17 (28%) in the middle third and eight (13%) in the upper third or cardias. In six patients (10%) the tumor was multicentric.

In this study almost 78% of the patients were anemic with Hb less than 10 gm/dl.

The H. pylori association in the gastric malignancies was found in 10 patients with 27.78% and was negative in 26 cases which comprised 72.22% (Table 5). Forman et al. have even showed that the proportions of the gastric cancer population positive for H. pylori antibodies varied from 28% to 96%. Another study done by Basnet RB et al. have shown the association of H. pylori and gastric malignancy.
CONCLUSION

Most of the patients of gastric malignancies were in the 4th and 5th decades of life and ages ranged from 21 to 84 years. There was a male preponderance and antrum was the most common site of gastric malignancy. The majority of the cancers were adenocarcinomas and nine of those were positive in cytology and none of the lymphomas or signet ring was positive in cytology. The wash cytology preceding gastric biopsy yield poor results and if gastric cytology is to be good modality for diagnosing gastric malignancy it would have to be augmented by brush and aspiration techniques. In our study 10 out of 36 cases were positive for H. pylori.

This study has been done in a small number of patients therefore, larger studies have to be carried out to see the proper association of H. pylori and gastric cancer and to find out the utility of gastric cytology in diagnosing various types of gastric malignancies.

REFERENCES