RESEARCH COMMUNICATION

Analysis of Gastrointestinal Malignancies at the Armed Forces Institute of Pathology (AFIP), Rawalpindi, Pakistan

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Abstract

Objectives: To determine the pattern of gastrointestinal (GI) malignancies in northern Pakistan. Design: A retrospective pathology based tumour registry data analysis. Place and Duration: January 1992 to December 2001 at the Armed Forces Institute of Pathology, Rawalpindi, Pakistan. Materials and Methods: All histologically diagnosed malignant tumours of GI tract registered with the tumour registry were retrieved from the case files. Basic epidemiological data regarding each case was collected from the request forms and then analysed for the site of involvement, age distribution and histological types of tumours. Results: During the study period a total of 2279 patients had GI tract malignancies, constituting 10.8% of all malignant tumours diagnosed in this period. Males were more frequently affected than females (M:F ratio 2.3:1). Peak incidence was in the 50-60 year age group. Colorectal tumours were most frequent (44.6%), followed by stomach (24%), esophagus (22.6%), anal (4.6%) and small intestinal (3.7%) malignancies. Ten cases of malignant tumours of the appendix, 6 in females and 4 in males were also found. The histological pattern was predictable. Statistical analysis showed that there was significant increase (P<0.01)in registration of stomach, anorectal and small intestinal tumours over the period studied,whereas esophagus and colorectal tumours remained the same. Conclusion: Colorectal tumours are more frequent in our material as compared to other developing countries. Peak incidence is in slightly younger age group and cases in <20 years age group are also more frequent as compared to Western studies.

Key Words: GI tract cancer - malignancies - frequency - histology

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Introduction

The pattern of gastrointestinal (GI) malignancies differs in different geographical areas, carcinoma of the esophagus being most frequent in Iran, carcinoma of the stomach in Eastern Asian countries and colorectal carcinomas in the developed world (Stewart and Kleihues, 2003; Munoz and Day, 1996). In Pakistan there also appears to be variation. In the Southern part of the country and studies of Quetta, carcinoma esophagus is at the top of the list of GI malignancies, whereas colorectal and stomach cancers are reported to be more prevalent in the northern parts of the country (Ahmad et al., 1991; Bhurgri, 2001; Bhurgri et al., 2002). The incidence of stomach cancer is lower in Pakistan as compared to other developing countries of Asia and Africa (Parkin et al., 1997), with a lower age of development of GI malignancies as compared to western populations (Mehdi, 1998). Dietary factors are important in GI malignancies particularly in colorectal cancer (Norat et al., 2002). The purpose of the present analysis was to ascertain the pattern of GI tract malignancies in our population and to compare it with other national and international data.

Materials and Methods

The Armed Forces Institute of Pathology, Rawalpindi receives specimens from various military and civil Institutions all over northern Pakistan. All histologically diagnosed malignant tumours of gastrointestinal tract are registered with the AFIP tumour registry. Basic epidemiological data regarding each case were here collected from the request forms, retrieved from the registry data. The study covered all malignant tumours of the GI tract, diagnosed from January 1992 to December 2001. The specimens were received in 10% formal saline. Gross examination of surgical specimens was performed and recorded on a proforma. Adequate representative tissue sections from the lesions were taken as described (Rosai, 2004) after processing under standardized conditions for paraffin embedding and staining with haematoxylin and eosin (H&E). Special stains were used where and when required. Each tumour was assigned an ICD-O code (Fritz et al, 2002), published by International Agency for Research on Cancer (IARC). The Chi-Square test was used for statistical analysis and p-values were calculated against

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observed frequency and expected frequency of different parameters, after adjusting for the the annual growth rate and increase in population.

Results

During the study period 2279 cases of GI malignancy were registered, constituting 10.8 of all malignant tumours diagnosed during the same period. Males were 1586 and 693 were females (Male: Female ratio 2.3:1). Age distributions are shown in the figure. Peak incidence was in 50-60 years of age and majority of the cases (40%) were seen between 50-70 years age groups. The Table summarizes data for the distribution of the tumours.

Esophagus (ICD 15.0-15.9) was involved in 22.6% cases of gastrointestinal tract with a male to female ratio of 1.6:1, and a peak incidence in the 50-60 year age group. Histologically, squamous cell carcinoma was the main type (91%), the remainder being adenocarcinomas involving the lower one third of the esophagus.

Stomach (ICD 16.0-16.9) was involved in 24% cases, males being more frequently affected than females (M:F ratio 3:1). Most of the cases (40%) were between 50-70 years of age but a few cases presented at younger age (< 20 years). Adenocarcinoma was the predominant histological type, with diffuse and intestinal types of tumours in almost equal proportions. Cases of malignant lymphoma, predominantly diffuse large 'B' cell type, were also seen.

A total of 84 patients (M:F ratio of 2.6:1) demonstrated malignancies of the small intestine (ICD 17.0-17.9). Of the known sites the duodenum was involved in 61.2% cases, in 30% of cases the ileum and the rest had involvement of the jejunum. Adenocarcinoma was the main type but cases of Non-Hodgkin lymphoma (23%), mostly in the ileum, were also found.

Table 1. Distribution of GI Malignant Tumours

S/No	Site	Male	Female	Total	Percentage
1	Esophagus	315	200	515	22.60
2	Stomach	408	139	547	24.00
3	Small intestine	61	23	84	3.70
4	Colorectal	727	304	1031	45.23
5	Anal canal	71	21	92	4.03
6	Appendix	4	6	10	0.44

Colorectal tumours (ICD 18.0-20.9) were the most frequent (45.23%) of all GI malignancies. Males were twice more frequently affected than females. Although the peak incidence was in the 50-60 year age group, 40 cases were seen in individuals less than 20 years of age. Of the known sites the caecum was involved in majority of the cases (16%), followed by the sigmoid colon (11%). Adenocarcinoma was the main type but cases of mucinous adenocarcinoma, signet ring tumours, adenosquamous carcinoma and malignant lymphoma were also seen. Malignant tumours of anal canal (ICD 21.1) were found in 4.0% patients, with males three times more frequently affected than females. Other than squamous cell carcinoma, cases of malignant melanoma were also found. Four cases in males and 6 in females involved the appendix (ICD 18.1), mostly mucinous adenocarcinomas (85%).

A comparison with previous AFIP data was conducted to detect increased registration of GI tumours. After adjusting for the increase in population and population growth rate, it was found that there was significant increased registration for stomach, small intestine and anal canal tumours (P<0.01), but not for colorectal or esophageal tumours.

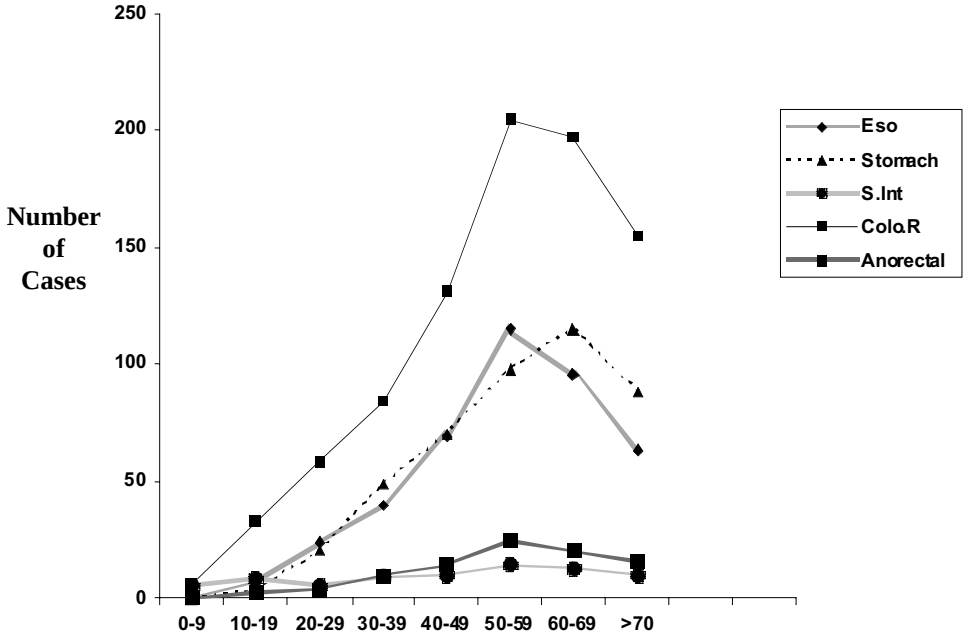

Figure 1. Age Distribution of GI Cancers according to the Site: Eso* (esophagus), S. Int* (small intestine), Colo.R (Colorectal)

Discussion

All over the world, GI tract malignancies form a significant proportion of malignant tumours in both sexes. In different studies from Pakistan 10-18% of all tumours are found to be GI malignancies (Bhurgri, 2001; Mehdi, 1998). In the present study, GI malignancies were found to be 11% of all tumours. Males are more frequently affected than females (Stewart and Kleihues, 2003; Ahmed et al., 1991; Bhurgri,2001), and same was found in the present analysis.

Colorectal tumours are second most frequent malignancy in affluent countries and are rare in developing countries (Stewart and Kleihues, 2003). In the previous series from the same institute and in the present study also, colorectal carcinoma was found to be most frequent of all GI malignancies (Ahmad et al., 1991). The difference from developed countries is that most of our cases are de novo rather than following adenoma carcinoma sequence observed in most of the developed countries (Mamoon et al., 1999). Diet is by far the most important factor identified in the aetiology of colorectal cancer. Diet rich in calories, animal fat, red meat and poor in vegetables and fruits is associated with increased risk of colorectal cancer (Troisi et al., 1999; Honda et al., 1999). In northern parts of the country, particularly North West Frontier Province of Pakistan red meat is probably more frequently consumed than other parts of the country. Whether this factor alone is responsible for consistently high frequency of colorectal cancer in our set up or not requires to be thoroughly investigated. Most cases of colorectal cancer in the west are seen after the age of 60 years (Stewart and Kleihues,2003), but we found majority of our cases in < 60 years age groups and quite a number of cases were less than 20 years of age.

About 60% of stomach cancer occurs in the developing countries. The areas of highest incidence are eastern Asia, Eastern Europe and some parts of South Africa, whereas in northern America and Europe the incidence is low. The risk of cancer changes within two generations on migration to new locale (Stewart and Kleihues,2003; Ferlay et al., 2001). In our study stomach cancer was the second most frequent of GI malignancies. Males are twice frequently affected in both high and low incidence areas (Ferlay et al., 2001; Sunny et al., 2004), and same male predominance was our observation as well as in a study of Karachi (Bhurgri et al., 2002). We observed 23 cases (4.2%) to be below 30 years age and after peak incidence in 60-70 years age group and then there was decrease in more than 70 years age group, which is contrary to what is reported that carcinoma stomach is extremely rare below 30 years and highest incidence is in the oldest age group (Stewart and Kleihues, 2003).

Worldwide, cancer of the esophagus is sixth most frequent and 80% cases are found in the developing countries. The geographical distribution differs more than what is observed for any other cancer (Munoz and Day, 1996). The Asian esophageal cancer belt extends from northern Iran through the central Asian republics to Henan province in north-central China (Munoz and Day, 1996; Gillis and Carter, 1976). In the present study carcinoma esophagus was 3rd most frequent of GI malignancies but in some other studies of Pakistan, particularly from Karachi and Quetta, carcinoma esophagus was found to be the most frequent of GI malignancies (Bhurgri, 2001; Bhurgri et al., 2002; Mehdi, 1998). In some of the studies it was indicated that the areas of Pakistan adjacent to the described "Asian esophageal cancer belt" also show increased frequency of this malignancy (Badar et al., 2005; Bhurgri et al., 2002; Jamal et al., 1997).

Malignant tumours of the small intestine are rare (Quriel and Adams, 1984) and similarly in this analysis these tumours were 0.4% of all tumours and 3.7% of all GI malignancies. There was significant increased registration as compared to our previous analysis ($p<0.01$), and this increase was more for duodenal tumours (61%) as compared to 48% of our previous similar analysis (Ahmad et al., 1994), which probably could be due increasing facilities to diagnose periampullary carcinoma.

In the end we can conclude from this study that analysis of GI malignant tumors showed some interesting and variable features like colorectal tumours although rare in developing countries are consistently most frequent in our studies. In our cases not only the peak incidence was in younger age group but quite a number of cases of carcinoma stomach and colorectal were seen below 20 years of age.

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