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# Shifting Proportions of Carcinoma Stomach: 18 Years Experience at Shaikh Zayed Hospital

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## ABSTRACT

**Objective:** To study the demographic, endoscopic and histological features of patients with carcinoma stomach presenting in the Endoscopy suite at the Shaikh Zayed Hospital. **Study Design:** Cross sectional type of descriptive study. **Place of study:** Study was carried out at Department of Gastroenterology and Hepatology Shaikh Zayed Post-Graduate Medical Institute Lahore from November 2005 to March 2006. **Method and material:** All patients diagnosed to have growth, ulcer or infiltrating lesion in stomach on upper gastrointestinal endoscopy were included from the record of the last eighteen years. Patients were divided in two groups depending on the time of endoscopy, each group comprising of endoscopies performed over nine years time. Both groups were compared using SPSS 11.1. **Results:** Total number of patients included was 267, male to female ratio was 1.42: 1 (158/109). Mean age of patients was 52.11 (range 17-85 years) with 39% patients below 45 years of age. Predominant gross appearance was polypoidal, seen in 179 (67%) patients while in 151(56%) patients tumor was located in body of stomach, while 71(27%) patients had tumor in antrum and 45(17%) in fundus. Time based analysis of two groups of patients revealed no significant change in location, gross appearance or histological diagnosis over 18 years in patients presenting at the Shaikh Zayed Hospital. **Conclusion:** Gastric carcinoma involves younger age group in our population and is mostly located in proximal two third of stomach. Features of gastric carcinoma have not shown much change over last 18 years in our population.

**Key Words:** Age distribution, Gastric carcinoma, Shifting proportions

## INTRODUCTION

Gastric carcinoma is the second leading cause of cancer deaths following lung cancer resulting in 628,000 deaths per year in USA[1]. It has shown decline in prevalence over the last few decades. It was the leading cause of cancer death only twenty years back[2]. With changing picture of this malignancy, it has also shown changes in demographic, clinical and histological features.[3] Mean age of patients at the time of diagnosis has increased in the last few decades.[4] Predominant location of this tumor used to be at the antrum of stomach. But large number of studies in recent past has identified shifting of tumor location in proximal parts of stomach.[5] Similarly changes in histopathological characteristics of these tumors have resulted in decline of intestinal type of tumor and increase in diffuse variety of carcinoma.[6]

Gastric malignancy has shown marked geographical variation with unusually high prevalence in certain regions like Far-Eastern countries e.g Japan and South Korea followed by Costa Rica and former Soviet Union[7]. Gastric carcinoma has shown positive correlation with ethnic origin, socio-economic conditions,[8] eating habits and family history.[9] These factors are different in our population compared with high prevalence areas. It is pertinent to look for this changing behavior of carcinoma stomach as far as demographic and endoscopic features are concerned, in our region as well.

Department of Gastroenterology – Hepatology, Shaikh Zayed Hospital Lahore, since its inception in 1986 has transformed into a major referral center for gastrointestinal and liver diseases in Pakistan. Aim of our study was to study demographic, endoscopic and histological features of carcinoma stomach in patients presenting at our institute.

## MATERIAL AND METHODS:

It was a retrospective study based on Endoscopy data of last 18 years from January 1987 to December 2004. Malignancy was suspected in patients with fungating, polypoidal mass, gastric ulcer, thickened folds, poor distensibility of stomach and polyps in the stomach. Only those patients later confirmed to have malignancy on histopathology were included. Patients with benign ulcers, benign polyps and gastrointestinal stromal tumor (GIST) were excluded from final analysis.

Features noted in each patient included, age, sex, date of endoscopy, location of tumor, gross appearance on endoscopy, effect of growth on patency of lumen and presence or absence of synchronus tumor, histopathology report of each patient was also noted for final diagnosis. Tumors were histopathologically classified according to Lauren Classification, dividing gastric carcinoma in two types, well differentiated intestinal type and poorly differentiated diffuse variety. [10]

### Statistical analysis

Statistical analysis was performed using a software package (SPSS 11.1; SPSS Inc, 1989-1999 Chicago, Ill). Results were expressed as mean ± SD. After complete analysis of data, we divided patients in two groups. Group 1 comprised of patients with upper GI endoscopy from 1st January 1987 to 31st December 1996 while patients with endoscopy from 1st January 1997 to 31st December 2004 were included in group 2.

Each continuous parameter between the two groups was analyzed with student's t test. Categorical data was examined using the chi square $\chi^2$ test. P value of less than 0.05 was considered significant for analysis. Both groups were compared for age and sex of patients, location of tumor, macroscopic features of growth and histological diagnosis of tumor. Cross tabulation was used for identification of exact distribution.

## RESULTS

Total number of patients with confirmed diagnosis of carcinoma stomach was 267 with male to female ratio 1.42:1 (157/110) and mean age of patients was 51.08±15.62 years. Distribution of different age groups among these patients is shown in Table 1. Interestingly 103 (38.6%) patients in our study were below 45 years of age.

**Table 1: Age distribution of patients with carcinoma stomach.**

| Age groups (Years) | Number | Percent (%) |
|---|---|---|
| 11 – 20 | 4 | 1.5 |
| 21 – 30 | 22 | 8.2 |
| 31 – 40 | 52 | 19.5 |
| 41 – 50 | 60 | 22.5 |
| 51 – 60 | 62 | 23.2 |
| 61 – 70 | 50 | 18.7 |
| 71 – 80 | 14 | 5.2 |
| Above 80 | 3 | 1.1 |
| Total | 267 | 100.0 |

On endoscopy, 179 (67%) patients had fungating polypoidal growth, 24 (9%) had growth involving the stomach, circumferentially. Ulcerating tumor was seen in 42 (15.7%) patients and diffuse infiltration of stomach with poor distensibility and prominent folds was noted in 22 (8.3%) patients. Patency of the lumen of stomach was unaffected by growth in 77 (28.8%) patients, partial occlusion of lumen was noted in 105 (39.3%) patients whereas, complete loss of luminal patency was present in 85 (31.9%) patients.

Location of gastric tumor was body of stomach, in 151 (56.6%) patients followed by antrum in 71 (26.6%) patients and fundus in 45 (16.9%) patients.

When we grouped our patients depending on time of diagnosis before or after 1st January 1997, 108 patients belonged to group 1 with diagnosis before 31st December 1996 whereas, 159 patients were in group 2 with diagnosis between 1st January

1997 and 31st December 2004. Age and sex distribution of these two groups is compared in Table 2 with no significant difference in two groups except for significantly more females in group 2. When endoscopic features of patients in two groups were compared regarding appearance, impact on patency of lumen of stomach and location. The difference was not statistically significant.

**Table 2: Comparison of patients of group-1 and group-2**

| Variables | Group 1 | Group 2 | p-value |
|---|---|---|---|
| Males | 55 (50.9%) | 102 (64.2%) | 0.031 |
| Females | 53 (49.1%) | 57 (35.8%) | |
| Mean age (SD) | 50.01 (15.23) | 51.725 (15.86%) | 0.741 |
| Age 45 or below | 45 (41.7%) | 58 (36.5%) | 0.393 |
| Age above 45 yrs | 63 (58.3%) | 101 (63.5%) | |

Group-1 Patients with endoscopy between 1st January 1987 and 31st December 1996
Group-2 Patients with endoscopy between 1st January 1997 and 31st December 2004.

Biopsies of these tumors revealed that 211 (79.02%) patients had adenocarcinoma of which 36 had signet ring cell cancer, gastric lymphoma was in 52 (19.38%) and 4 (1.6%) had carcinoid tumor. Of patients with adenocarcinoma, intestinal type was seen in 136 (64.5%) and 75 (35.5%) had diffuse variety of adenocarcinoma. Comparison of two groups as is shown in Table 3 revealed increase in diffuse variety of tumor in time interval 1997-2004, which was statistically not significant (p value >0.05).

## DISCUSSION

Gastric cancer is largely considered to be a tumor of old age. Majority of patients in United States present between age of 65-74 years with mean age of 70 years for males and 74 years for females.[11] Similar age distribution was shown by Lund O et al in their 25 year data.[12] Mean age of patients in our study was 51 years with maximum number in the range of 41-60 years. Similar results were reported by Aman Ullah et al. from Peshawar, Pakistan, wherein the range was between 30-40 years of age.[13] Mean age of patients with gastric carcinoma was also reported between 50-60 years by Maehara Y et al.[14]

**Table 3: Comparison of endoscopic features of patients of group 1 and 2**

| Endoscopic features | Group 1 | Group 2 | p-value |
|---|---|---|---|
| **Gross appearance of growth** | | | |
| Polypoidal | 79 (73.1%) | 100 (62.9%) | |
| Circumferential | 7 (6.5%) | 17 10.7%) | 0.435 |
| Ulcerating | 15 (13.9%) | 27 (17.0%) | |
| Diffuse infiltrating | 7 (6.5%) | 15 (9.3% | |
| **Patency of gastric lumen** | | | |
| Patent lumen | 36 (33.3%) | 41 (25.8% | |
| Partial occlusion | 37 (34.3%) | 68 (42.8%) | 0.270 |
| Completely occluded | 35 (32.4%) | 50 (31.4%) | |
| **Location of tumor** | | | |
| Fundus | 19 (17.6%) | 26 (16.4%) | |
| Body | 58 (53.7%) | 93 (58.4%) | 0.793 |
| Antrum | 31 (28.7%) | 40 (25.2%) | |
| **Histopathology results** | | | |
| Adenocarcinoma | 91 | 120 | |
| Intestinal type | 60 (65.9%) | 76 (63.3%) | 0.651 |
| Diffuse | 31 (34.1%) | 44 (36.7%) | |

Group-1 Patients with endoscopy between 1st January 1987 and 31st December 1996
Group-2 Patients with endoscopy between 1st January 1997 and 31st December 2004.

What is most alarming in our results is the fact that more than 38% of our patients are less than 45 years of age. It is the age limit above which it is prudent to screen every patient with new onset upper GI symptoms for carcinoma stomach. It stresses the need of screening our population at lower age limit and the need to develop consensus

guidelines of screening for our patients.

Comparison of age distribution of patients in two groups reveals that increased number of patients are seen in age group 61-70 years in group 2 (1997-2004) as compared with group 1 (1987-1996), but the difference is not statistically significant. Sidoni A et al reported that mean age of patients of gastric carcinoma has changed from 57 year, between 1942 – 56 to 66 year in 1986-87. [15] Not much change was noted in our data.

Male to female ratio of our study (1.42:1) is in accordance with what is seen world over, i.e. more prevalence of gastric carcinoma among males[11,16]. But time based analysis revealed significantly increased number of female patients being diagnosed with cancer in group 2 (1997-2004) as compared with preceding nine years. Population based study can only be relied to confirm or refute this observation.

Location of tumor in stomach is another focus of interest. Gastric cancer has shown shift from distal third to proximal two third. Salvon-Harman JC et al studied the behavior of gastric malignancy over 26 years and identified significant shift of gastric adenocarcinoma to a proximal location (p 0.0075).[5] Similar increase in proportion of tumors in proximal two third of stomach from 32% to 42% was observed in a study of 17 years (1974-1991).[17] Declining prevalence of antral tumors is shown in a number of other time-based studies.[15,18,19,20]

In our study 73.5% of tumors were located in proximal two third as compared with 26.6% in the antrum. Increase in proximal tumors was identified in our study in group 2 (1997-2004) as compared with group 1 (1987-1996) from 71.3% to 74.8% which is statistically not significant. (p value 0.793)

Adenocarcinoma constitutes the predominant histological type of cancer in the stomach. Lauren classification is mostly used to classify these tumors, accordingly most of tumors are well differentiated type of intestinal carcinomas followed by diffuse undifferentiated and intermediate variety.[21] Last few decades have seen a surge in the incidence of diffuse type of undifferentiated cancer with relative decline in intestinal variety.[16,17] Most of tumors in our study are also well differentiated type of adenocarcinoma followed by diffuse variety. Few cases of lymphoma and carcinoid tumors were also seen and not much change was observed in histological pattern of gastric cancer within the time of our study.

This long term study has enabled us to observe changing patterns of carcinoma stomach in our population and brings forth the alarming fact regarding much younger age of our patients of gastric cancer and proximal shift of tumor in stomach. Our data are limited by the fact that it is not population based but was carried out at tertiary care referral center. There is no information regarding clinical presentation, treatment offered to these patients and outcome of illness. Large prospective study can help further in developing guidelines for screening and treatment of patients with carcinoma of the stomach, thus enabling us to diagnose cases of gastric carcinoma at earlier treatable stage.

## CONCLUSION

Gastric carcinoma predominantly involves younger age group in our population and is mostly located in proximal two third of the stomach. Features of gastric carcinoma have not shown much change over last 18 years in our population.

## REFERENCE


1. Pisani P, Parkin D, Bray F, Ferlay J. Estimates of the world wide mortality from 25 cancers in 1990. Int J Cancer 1999; 83: 870-3.
2. Parkin D, Laara E, Muir CS. Estimates of worldwide frequency of sixteen major cancers in 1980. Int J Cancer 1988; 41: 184-97.
3. Devesa SS, Blot WJ, Fraumeni JF Jr. Changing patterns in the incidence of esophageal and gastric carcinoma in the United States. Cancer. 1998; 83: 2049-53.
4. Caruso RA, Finocchiaro G, Bersiga A, Fedele F, Betri E, Rigoli L et al. Clinicopathological features of early gastric cancer in younger versus older patients in a high incidence area of Northern Italy. Ital J Gastroenterol Hepatol. 1997; 29: 138-42.
5. Salvon-Harma JC, Cady B, Nikulasson S,

Khettry U, Stone MD, Lavin P. Shifting proportions of gastric adenocarcinomas. Arch Surg. 1994; 129: 381-8.
6. Inoue M, Tajima K, Kitoh T, Sakomoto J, Yamamura Y, Sato T, et al. Changes in histopathological features of gastric carcinoma over a 26 year period (1965-1990). J Surg Oncol. 1993; 53: 256-60.
7. Whelan S, Parkin D, Masuyer E. Cancer incidence in 5 continents. Coding practices. Health Rep 1993; 5: 73-9.
8. Faggiano F, Partanen T, Kogevinas M, Boffetta P. Socioecnomic differences in cancer incidence and mortality. IARC, Scientific Publications. 1997; 138: 65-176
9. Palli D, Galli M, Caporaso NE, Cipriani F, Decarli A, Saieva C. Family history and risk of stomach cancer in Italy. Cancer Epidemiol Biomarker Prev 1994; 3:15.
10. Lauren P: The two histological main types of gastric carcinoma, diffuse and so called intestinal type carcinoma: An attempt at a histoclinical classification. Acta.Pathol Microbiol Scand. 1965; 64: 31-49.
11. Olge KS, Swanson GM, Woods N, Azzouz F. Cancer and comorbidity: redefining chronic diseases. Cancer. 2000; 88: 653-63.
12. Lund O, Hasenkam JM, Aagaard MT, Kimoso HH. Tie-related changes in characteristics of prognostic significance in carcinomas of the esophagus and stomach. Br J Surg. 1989; 76: 1301-7.
13. Ullah A, Ziauddin, Saeedi I, Mehmood K. Geographical distribution and histological presentation of gastric carcinoma in NWFP. JPMI 2003; 17: 111-5.
14. Maehara Y, Emi Y, Tomisaki S, Oshiro T, Kakeji Y, Ichiyoshi Y et al. Age-related characteristics of gastric carcinoma in young and elderly patients. Cancer 1996; 77: 1774-80.
15. Sidoni A, Lancia D, Pietropaoli N, Ferri I. Changing patterns in gastric carcinoma. Tumori. 1989; 75: 605-8.
16. Kim DY, Joo JK, Ryu SY, Park YK, Kim YJ, Kim SK. Clinicopathological characteristics of gastric carcinoma in elderly patients: A comparison with young patients. World J Gastroenterol 2005; 11: 22-6.
17. Borch K, Jonsson B, Tarpila E, Franzen T, Berglund J, Kullman E et al. Changing pattern of histological type, location, stage and outcome of surgical treatment of gastric carcinoma. Br J Surg. 2000; 87: 618-26.
18. Craanen ME, Dekker W, Blok P, Ferwerda J, Tytgat GN. Time trends in gastric carcinoma: changing patterns of type and location. Am J Gastroenterol 1992; 87: 572-9.
19. Rios-Castellanos E, Sitas F, Shepherd NA, Jewell DP. Changing patterns of gastric cancer in Oxfordshire. GUT 1992; 33: 1312-7.
20. Popiela T, Kulig J, Kolodziejczyk P, Sierzega M. Changing patterns of gastric carcinoma over the past two decades in a single institution: clinicopathological findings in 1557 patients. Scand J Gastroenterol, 2002; 37: 561-7.
21. Popiela T, Kulig J, Kolodziejc, Zyk P. Polish Gastric Cancer Study Group. Relationship between improved prognosis in gastric cancer patients in the last 25 years and changing methods of surgical and combined treatment. Przegl Lek. 2000; 57 Suppl 5: 9-13.

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