Original Research Article

Epidemiological review and clinicopathological study of gastric adenocarcinoma cases in a tertiary care center in North Chennai, India

R. Padmavathi, J. Priyadharisini[2]*

[1]Department of Pathology, Govt. Madras Medical College, Chennai, Tamil Nadu, India
[2]Department of Pathology, Sri Lakshmi Narayana Institute of Medical Sciences, Puducherry, India

*Correspondence:
Dr. J. Priyadharisini,
E-mail: priyadharsini158@gmail.com

ABSTRACT

Background: Gastric carcinoma is the third most common cause of cancer-related mortality worldwide. The Incidence of gastric carcinoma shows wide geographic and regional variation as well. The clinical presentation varies with the individual and hence histopathological evaluation plays a major role in the diagnosis and management of the patients. This study aims to evaluate the epidemiological and clinicopathological profile of gastric adenocarcinoma cases encountered in a tertiary care center in North Chennai where only limited statistical data available in literature.
Methods: All the gastric adenocarcinoma cases diagnosed by histopathology who underwent total/subtotal gastrectomy were retrospectively collected for clinical as well as histopathological details for a year. Descriptive statistics were used for analysis.
Results: The mean age of the study population is 59.3±11.3 with male: female sex ratio of 2.1:1. Higher prevalence noted in lower socioeconomic status (80%) and alcoholics (65%) with a history of high salted diet (62%). Most common presenting symptom was dyspepsia (94%). Upper GI endoscopy revealed antrum (42%) as the commonest site of tumor and majority were more than 5 cm size (75%). 62% of tumors were of moderately differentiated, predominantly intestinal type (86%) and mostly found to be in stage 3 (50%).
Conclusions: Gastric adenocarcinoma was more common in elderly males and majority presented in advanced stage at the time of diagnosis. The General public needs to be creating awareness about variable nonspecific symptoms of an early stage of gastric carcinoma as well as the risk of poor dietary habits (high salted diet) and can enforce screening of high-risk category people.

Keywords: Demography, Histopathological profile, Gastric adenocarcinoma, North Chennai

INTRODUCTION

Gastric carcinoma is the third most common cause of cancer-related mortality worldwide.[1] Adenocarcinoma constitutes more than 90% of all gastric cancers. The Incidence of gastric cancer shows wide geographic variation showing the highest incidence in Southeast Asia such as Japan and China followed by the least incidence areas such as USA and Philippines. National Cancer Registry Program points that gastric cancer occupies the leading site (9.1%) in Chennai and fourth leading site (6.4%) in Bangalore.[2] Regional variation is of utmost importance, knowledge of which can help to plan appropriate surveillance programme in those regions. As most of these cases present at an advanced stage, surveillance programme may help in early screening and detection of cases.

The clinical presentation varies with individuals as the symptoms were nonspecific at early stages and hence histopathological examination plays a major role in concluding as well as excluding gastric carcinoma which has the major impact in management and prognosis of the patient. Standard treatment of gastric carcinoma is a multidisciplinary approach which is based on clinical stage and other comorbidities.[3]

There are only limited statistical data of gastric carcinoma available for the region of North Chennai in works of literature which prompted us to conduct this study in our tertiary center which is one of the biggest referral center in North Chennai.

METHODS

The study was longitudinal retrospective study. The protocol of the study was reviewed and approved by the Institutional Ethical Committee. Retrospective analysis of the database of all the cases of histologically verified diagnosis of Gastric adenocarcinoma who underwent total/subtotal gastrectomy from August 2011 to August 2012 was done.

Inclusion criteria

Fifty patients with histologically verified diagnosis of gastric adenocarcinoma in resection specimens were selected (only cases with complete clinical data) as subjects in the study.

Exclusion criteria

- Non adenocarcinoma cases.
- Patients who underwent preoperative chemotherapy.

Descriptive analysis was done. Demographic details such as age and sex distribution, socioeconomic status, dietary habits, tobacco/alcohol abuse were collected. Socioeconomic status was assessed by Kuppusamy scale which was routinely done in our clinical outpatient departments. On the other hand, clinicopathological profile of all the cases including chief complaints, endoscopic findings, surgery type, tumor size, site, histological type, grade, and stage were tabulated. Tumors were classified according to Lauren's classification and graded by WHO criteria and were staged according to the AJCC staging system (8th edition). Statistical analysis was performed using SPSS software version 22 (IBM Corp, USA).

RESULTS

The mean age of study population is 59.3±11.3 yrs (range, 35-76yrs) with male: female sex ratio of 2.1:1 (male 68%, female 32%). The largest cluster of cases was found in the 66-75 age group in both the sexes. 80% of patients belong to lower socioeconomic status and the rest of them falls to the upper lower class. Most of the

men (65%) were alcoholics and 37% of female patients had a history of the habit of tobacco chewing. 62% of patients were found to consume salted fish and pickle more frequently. No significant family history was noted in any of these cases. Dyspepsia (94%) was the most common chief complaint followed by epigastric pain (80%) and vomiting.

Upper GI scope was done in almost all the cases preoperatively which revealed predominantly proliferative type of growth (82%) followed by ulcerative lesion (Figure 1).

Most common site of the tumor was antrum (42%) followed by the body of the stomach (36%). Most common histological type was an intestinal type (86%) (Figure 2). 88% of ulcerative lesions were of a diffuse type of gastric adenocarcinoma.

Figure 1: Total gastrectomy specimen showing a diffuse proliferative type of growth involving body and antrum of the stomach.
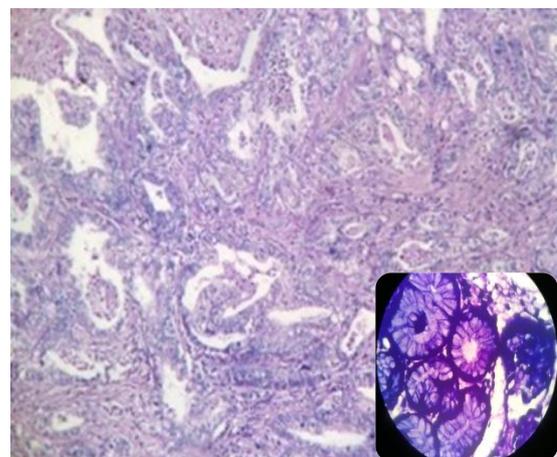

Figure 2: Histopathology showing moderately differentiated adenocarcinoma (H&E-20X) with the inset showing Giemsa stain with *H. pylori* positive (Giemsa-100X).

All diffuse type of gastric adenocarcinoma was poorly differentiated, whereas intestinal type showed predominantly moderately differentiated tumor (62%) with p-value of 0.000, which is also statistically significant (Table 1). *H. pylori* was seen positive in 22% of cases and all of them were an intestinal type of adenocarcinoma. Among histological grade, moderately differentiated tumors were most frequent (62%) followed by poorly differentiated tumors. Stage distribution was as follows; stage 1-20%, stage 2a-12%, 2b- 10%, stage 3a-4%, 3b- 24%, 3c-22%, stage 4-8%. 75% of tumors were showing mean tumor size of more than 5cm, a majority

of which belongs to stage III (66%) with p-value of 0.003 which is statistically significant (Table 2).

Table 1: Histological type versus histological grade.

Histological type	Histological grade (50)		
	Well differentiated	Moderately differentiated	Poorly differentiated
Intestinal	7	31	5
Diffuse	0	0	7

Table 2: Pathological stage versus grade and size of the tumor.

Pathological stage	Histological grade (50)			Size of tumor	
	Well differentiated	Moderately differentiated	Poorly differentiated	<5 cm	>5 cm
I	7	3	0	10	0
II	0	11	0	3	8
III	0	17	8	2	23
IV	0	0	4	0	4

DISCUSSION

Gastric carcinoma is one of the most promising malignancy worldwide which is the major cause of cancer-related mortality.

Global research output in stomach cancer was contributed by many countries of which India contributes global publication share of just 0.14%, of which pathology department contributes only very miniscule indicating lack of Indian research data.[4] Knowing the fact that the incidence and prevalence of gastric adenocarcinoma varies widely in different parts of the world and region as well, which is due to different sociocultural reasons, this study attempts to figure out the demographic and clinicopathological profile of gastric adenocarcinoma cases encountered in our tertiary care centre which is a leading referral centre in North Chennai region.

Present study shows a steady increase in the incidence of gastric carcinoma from the third decade and peaked at sixth to the seventh decade (mean age- 59.3, range 35-76 yrs) with male predominance (M:F-2.1:1) which is corroborated with similar other studies as well.[5-8]

No cases less than 30 years of age are noted which may be due to under-reporting of younger age patients owing to non-specific symptoms of early gastric carcinoma. Almost all the cases studied fall into two major categories (lower and upper lower classes) of socioeconomic status out of five in kuppusamy scale, of which majority (80%) of cases belong to lower socioeconomic class, finding which is similar to many studies done.[5,9,10] This

concentration of cases in lower socioeconomic class could be due to imbalanced diet intake and negligence of medical intervention at an early stage among this group of people. Risk factor analysis of study population revealed that most (85%) of the males were alcoholic and smokers with some of the females (37%) also had a history of tobacco use in form of chewing. 62% of the people had a habit of frequent intake of salted fish and pickle (2-3/week) in their diet and frequency was more (>5/week) in males who were alcoholic (as the salted fish and pickle been frequently consumed along with alcohol).[11,12] Most common chief complaint is dyspepsia and epigastric pain which seems to be more than six months duration indirectly indicating the possibility of gastritis in these patients.

UGI endoscopy is the routine modality of evaluation which was done in almost all the cases revealed a predominantly proliferative type of growth especially in the site of antrum (42%) which is the commonest site.[5,9,12,13] Though the incidence of distal stomach cancer is decreasing nowadays, this increased frequency in the current study may indicate the endemicity of *H. pylori* in this region, which is a major risk factor for gastric carcinoma.

The standard mode of treatment includes surgery and chemotherapy, treatment decision is basically individually based.[14] Subtotal and total gastrectomy was done based on the site of tumor as well as clinical staging. Grossly the size of the tumor was studied to evaluate its significance and were categorized into tumors more than 5 cm and less than 5 cm.

Lauren's histological classification system was preferred in this study as it classifies tumor into two broad categories which have distinct different etiopathogenesis and based on which many national treatment guidelines were made. Most common histological type was an intestinal type of gastric adenocarcinoma which is in concordance with some similar kind of studies.[5,15] However, many studies show an increase in a diffuse type of carcinoma which could be probably due to different histological (e.g. Bormann) classification/ non-endemicity of *H. pylori* in those regions. *H. pylori* was seen positive in 22% of cases and all of them were an intestinal type of adenocarcinoma. Most frequent grade was moderately differentiated tumor followed by a poorly differentiated tumor. There is a statistically significant correlation between histological type and grade of the tumor (p-value= 0.000).

Most common stage encountered were stage III (50%) of which stage IIIB accounts for 48% followed by stage IIIC (44%). Four cases of metastasis noted all of which were liver metastasis. It shows that well-differentiated tumors present at early stage whereas least differentiated tumors present at an advanced stage. Stage has been proven already as significant, independent prognostic factor, it showed a statistically significant correlation with the size of the tumor as well as grade (p-value=0.003).

CONCLUSION

Gastric adenocarcinoma was more common in elderly males. Majority of the cases were an intestinal type and moderately differentiated and presented in advanced stage at the time of diagnosis. This study showed statistical significance between histological type and grade as well as mean tumor size versus pathological stage. The general public needs to be creating awareness about variable nonspecific symptoms of an early stage of gastric carcinoma as well as the risk of poor dietary habits (high salted diet) and excessive use of alcohol and can enforce screening of high-risk category people in this region.

ACKNOWLEDGEMENTS

REFERENCES

1. Kapoor R, Mukherjee A, Srinivasa GY, Gupta R. Demography and clinicopathological characteristics of primary gastric cancers in Northern India. Clin Cancer Investig J. 2017;6:149-52.
2. Development of an Atlas of Cancer in India, A project of the National Cancer Registry Programme (ICMR). Available at: http://www.canceratlasindia.org/chapter 6. Accessed 22 December 2018.
3. Priyadharisini Jayakumar, Padmavathi Rajagopalan. Study of prognostic significance of CD44 (cell adhesion molecule) expression in gastric adenocarcinoma. Global J Res Analysis. 2018;7(7).
4. Gupta R, Gupta BM, Bansal M. Stomach cancer research: A scientometric study of Indian publications during 2005-14. SSARSC International Journal of Library, Information, Networks and Knowledge July- December. 2016;1(2):1-20.
5. Nandi A, Biswas PK, Kar M, Sinha SK. Clinicopathological profile of gastric cancer in a tertiary care hospital in Eastern India: A prospective 2 year study. Clin Cancer Investig J. 2014;3:14-20.
6. Theodor JK, Wang TC. Tumours of the stomach. In: Feldman M, Lawrence S, Sleisenger FM, editors. Sleisenger and Fordtran′s Gastrointestinal and Liver Disease-Pathophysiology/Diagnosis/Management. 7th ed. 2002;(1):829-855.
7. Sigon R, Canzonieri V, Rossi C. Early gastric cancer: A single-institution experience on 60 cases. Suppl Tumori. 2003;2:S23-6.
8. Safaee A, Moghimi-Dehkordi B, Fatemi SR, Ghiasi S, Pourhoseingholi MA, Zali MR. Clinicopathological Features of Gastric Cancer: A Study Based on Cancer Registry Data. IJCP 2009;2:67-70.
9. Chattopadhyay SD, Singhamahapatra RK, Biswas RS, Sengupta TK, Bandopadhyay A, Nath NC, et al. Prevalence of carcinoma stomach in a tertiary referral centre in Eastern India and its correlation with endoscopic findings. J Indian Med Assoc. 2011;109:336-8.
10. Liu L, Wang ZW, Ji J, Zhang JN, Yan M, Zhang J, et al. A cohort study and Meta-analysis between histopathological classification and prognosis of gastric carcinoma. Anticancer Agents Med Chem 2013;13:227-34.
11. Dikshit RP,Mathur G, Mhatre's, Yeole BB. Epidemiological review of gastric cancer in India. Indian J Med Paediatr Oncol. 2011; 32:3-11.
12. Chandramohan Servarayan Murugesan, Kanagavel Manickavasagam, Apsara Chandramohan, Abishai Jebaraj, Abdul Rehman Abdul Jameel, Mayank Shikar Jain, et al. Gastric cancer in India: epidemiology and standard of treatment. Updates Surg. 2018;70(2):233-9.
13. Dong-Yi Kim, Jae-Kyoon Joo, Seong-Yeob Ryu, Young-Kyu Park, Young-Jin Kim, Shin-Kon Kim. Clinicopathologic characteristics of gastric carcinoma in elderly patients: A comparison with young patients. World J Gastroenterol. 2005;11(1):22-6.
14. Sambasivaiah K, Ibrarullah M, Reddy MK, Reddy PV, Wagholikar G, Jaiman S, et al. Clinical profile

of carcinoma stomach at a tertiary care hospital in South India. Trop Gastroenterol. 2004;25:21-6.

15. Flucke U, Mönig SP, Baldus SE, Zirbes TK, Bollschweiler E, Thiele J, et al. Differences between biopsy- or specimen-related Laurén and World Health Organization classification in gastric cancer. World J Surg. 2002;26:137-40.