International Journal of Science and Research (IJSR)
ISSN (Online): 2319-7064
Index Copernicus Value (2013): 6.14 | Impact Factor (2014): 5.611

Carcinoma of Stomach – A Study of 381 Cases

Y. Subrahmanyam[1] K. Suneetha[2]

Department of pathology, affiliated to Rajiv Gandhi Institute of Medical Sciences (RIMS), Kadapa & Ongole, A.P., India

Abstract: ***Background: Gastrointestinal tract is an important site for cancer in men and women throughout the world (1). The stomach remains the second most common form of cancer in the world accounting for around 10% of all cancers (2). Gastric cancer is the fourth most commonly diagnosed cancer and the second most common cause of cancer-related death worldwide (3,4,5,6, 7). Studies from various parts of India indicate that malignancy of stomach more common in south India. This is possibly due to the fact that the common predisposing factors for gastric malignancies like diet, socioeconomic status, smoking, H. Pylori infection, obesity, alcohol abuse, and genetic factors(5). Objective is to study the occurrence and Clinical pathological correlation of malignant tumours of stomach. The methodology is retrospective four and prospective four years study of gastric malignancies from 2007-2015. Results: 23717 surgical specimens from 2007 to 2015 subjected to retrospective and prospective study shows 381 gastric malignancies. Conclusion: Out of 381 malignancies of stomach Adenocarcinoma (intestinal type) is predominant variety in men and women with male preponderance in poor rural patients with alcohol and smoking as risk factors.***

Keywords: Stomach, Adenocarcinoma, lymphoma, GIST, carcinoid

1. Introduction

Gastrointestinal tract is an important site for cancer in men and women throughout the world (1). The stomach remains the second most common form of cancer in the world accounting for around 10% of all cancers (2). Overall rates in men are double than in females (3). Carcinoma stomach is very high in Japan (4). Studies from various parts of India indicate that malignancy of stomach more common in south India (1). This is possibly due to the fact that the common predisposing factors for gastric malignancies like diet, socioeconomic status, smoking, H. Pylori infection, obesity, alcohol abuse, and genetic factors vary considerably from country to country as well as within different parts of the same country (5). Gastroenterology is a rapidly developing and expanding branch of medicine in which histopathology plays an important role in diagnosis and treatment. Hence it may be useful to study the occurrence and clinical-pathological correlation of these tumours in order to have an idea of local behaviour of the tumours. Endoscopy serves as a primary diagnostic procedure for conditions not otherwise diagnosable in an intact patient. It is useful in identifying the lesions and to differentiate benign from malignant ulcer. Buch Holtz et al, 1978 has shown 80% accuracy in diagnosis by endoscopy. The remaining 20% must be evaluated by histological examination. The present study is undertaken to learn the occurrence, the basic pattern along with their variations of various malignant tumours of stomach.

2. Literature Survey

Gastric cancer is the fourth most commonly diagnosed cancer and the second most common cause of cancer-related death worldwide (6, 7). Although the incidence of gastric cancer has gradually decreased over the last half century, cancer at proximal stomach is on the rise (8, 9). Today, gastric cancer is still the seventh most common cause of cancer-related death in the United States (10) and the prognosis of advanced gastric cancer remains poor. Gastric carcinogenesis is a multistep and multi factorial process. While the intestinal type of gastric cancer is often related to environmental factors such as Helicobacter pylori infection, diet, and life style, the diffuse type is more often associated with genetic abnormalities. Recent advances in molecular medicine have not only shed light on the carcinogenesis of gastric cancer, but also offered novel approaches regarding prevention, diagnosis and therapeutic intervention. In order to diagnose and discuss the malignant neoplasm of stomach, classification is expedient. The most widely acceptable and used classification is WHO 2010 histological features and genotypes and molecular phenotypes helps in better understanding of each subtypes. The pathologic classification of TNM stage system 1998 is based on gross and microscopic examination. In the study of gastric neoplasm the Lauren's (11) classification namely intestinal or diffuse type and the Ming's (12) classification namely expanding or infiltrating type may also be used. The Japanese classification for gastric carcinomas namely early and advanced is also commonly used. A classification based on the gross appearance of the lesion as seen through gastro scope elaborated by Borrmann and cited by Hoerr and Hodgmann (13) is also commonly used by surgical gastroenterologists and pathologists. Grossly polypoidal or circumscribed growths have better prognosis than ill defined infiltrating growths**.**

Adenocarcinoma: Marked variation in the incidence of stomach cancer between countries and inside countries (15, 16) noted. The epidemiological studies of dietary factors on the incidence of gastric cancer by Graham Schotz and Marino, 1972 showed an elevated risk with consumption of pickled vegetables and dried and salted foods. Nitrosamines a potent group of carcinogen in the pathogenesis of gastric cancer (17) was observed. High incidence of stomach cancer noticed among persons of blood group A (18).The histological classification of gastric adenocarcinoma is made difficult because the complex structure of the gastric mucosa. Mulligan 1975 (20) classified gastric carcinoma into three groups basing on histological analysis of 297 gastric carcinomas into Mucous cell carcinoma 45.2%, pylori-cardiac gland cell carcinoma 28.3%, intestinal cell carcinoma 23.4% and 3.1% of unclassified. Lauren classification was used in a study of Stemmerman and Brown, 1974 (5 years survival) (21) in Hawaii Japanese with gastric cancer, where stage 2 and 3 in each group were

combined using TNM system (22). There was a 27.4% 5 year survival in the intestinal group compared with 9.9%in diffuse type. Ming 1977(12) classified gastric carcinoma into expanding type and infiltrative type based on analysis of 171cases, 67% of expanding type, 33% of infiltrative type. Expanding type is characterized by aggregates or masses of cells which maintained coherent relationship, irrespective of cell maturation and differentiation. Infiltrative type characterized by deep and wide infiltration by isolated, individual tumour cells either though out the entire tumour or in most areas. The gross forms of tumour fall into 5 well recognised groups. Polypoid form, superficial form, ulcerated form, fungating form and diffuse form. Gastric Adenocarcinoma produce mucin that gives positive staining with diastase PAS or Alcian blue (27). WHO classification of Adenocarcinoma: 1.Carcinoma-in-situ/severe dysplasia, 2. Papillary Adenocarcinoma, 3. Tubular Adenocarcinoma, 4. Mucinous (>50% of mucin), 5. Signet ring (>50% signet-ring cells), 6. Un differentiated adenocarcinoma. Histological grading: Grade x- grade cannot be assessed, Grade-1-well (>95% of tumour composed of glands), Grade-2-moderately differentiated (50% to 95% tumour composed of glands), Grade3- poorly differentiated (5% to 49% of tumour composed of glands), Grade-4 undifferentiated (<5% of tumour composed of glands).

Lymphomas: Most GIT lymphomas arise in the stomach accounting for 3% of all gastric neoplasm. Lymphomas of stomach account for 60-65% of GI lymphomas. The Kiel, Rappaport, Lukes and Collins, working formulation and Revised European American system classifications are in use but a significant number of GI lymphomas cannot be accurately classified with anyone system. The criteria that should be present for diagnosis of a primary GIT lymphoma includes predominant enteric lesions with only regional lymph node involvement, absence of lymphomatous involvement of peripheral and mediastinal lymph nodes, liver and spleen and normal white blood cell count. Histological studies have demonstrated that 92-100% of gastric lymphomas are associated with concurrent H. pylori gastritis (32,33,34).

Gastrointestinal Stromal Tumours: GISTS are one of the most controversial GIT tumours in regard to cell origin, differentiation, nomenclature and prognosis. Appleman and Helwig have postulated that gastric stromal tumour may originate from mesenchymal cells other than smooth muscles. The spindle cell neoplasm of the GIT is called leiomyoma or leiomysarcoma and the predominant round or polygonal cell variant was named epitheloid leiomyoma, leiomyoblastoma or epitheloid leiomyosarcoma. Kindoblom et al 1998 and others have proposed that most stromal tumours from mesenchymal stem cell that differentiate toward an intestinal cell of Cajal phenotype. ICCS express the C-kit (CD117) PROTO-ONCOGENE encoding a type III tyrosine kinase (KIT) receptor, a ligand known stem cell factor. Maturation of ICC depends on SCK-KIT interaction. Evidence now suggests that CD34 positive stromal tumour known to be C-Kit positive may differentiate ICC like cells. The lack of expression of CD34 in the benign GIST may indicate that benign GISTs are composed of more mature ICCs, whereas malignant GISTs are composed of differentiated ICCS that express CD34 positive stem cells. Approximately 50-70% of GISTs arises in the stomach. Most frequently occur over the age of 55. Most are solitary and range in size from 1-20 cm, well circumscribed, not encapsulated often lobulated or multi nodular. On cut section, GISTs are gray white to yellow tan rubbery fleshy or glassy lesions that often have central areas of cystic degeneration and haemorrhage. Histology of GIST shows two basic cell types, spindle and epitheloid. Typical spindle cell tumour occurs in the gastric corpus. The epithelioid stromal tumours occur more commonly in the antrum. The pathological assessment of malignancy in GIST is notoriously difficult unless invasion of adjacent structures is apparent or there are overt metastases, Cooper PN et al 1992.

CARCINOID TUMOUR: On some occasions it behaves as benign tumour and on others it behaves highly malignant (35). More than ninety percent of carcinoid tumours originate in GIT. They have typical, clinical, biochemical and histological features, depending on their site of origin. Gastric carcinoids usually present in the middle aged adults as asymptomatic gastric polyps of corpus. In a series of 72 GIT carcinoids reviewed, only one case was reported in the stomach (35). Yamin M et al (36) reported 7 cases out of 107 GIT carcinoids. The majority of carcinoids are small; slow growing, and locally infiltrative low grade malignancies. Tumours less than 1 cm rarely metastasise; Rogush W et al. Gastric carcinoids occurring in the context of hyper gastrinaemia are usually small and virtually never metastasize. They are best treated by partial gastrectomy (31). Most gastric carcinoids occur as smooth firm well circumscribed polypoidal elevation of the mucosa and sub mucosa show yellow-gray cut surface. Typical gastric carcinoids are composed of small uniform polygonal or cuboidal cells with regular round or oval nuclei, stippled with chromatin; show minimal nuclear pleomorphism arranged in nests or trabeculae of cells separated by loose connective tissue. Occasionally tumour cells form rosette, tubular or acinar structures. They arise in the gastric mucosa and infiltrate the sub mucosa. These coexist with gastric adenocarcinoma as adenocarcinoids, Caruso ML et al 1989.

3. Methods/Approach

The department of pathology, RIMS, Kadapa caters diagnostic histopathology needs of the institute and adjoining referring hospitals of rayalaseema, Andhra Pradesh. A total of 23717 surgical specimens were subjected for retrospective and prospective analysis with the aim of studying the malignant tumours of stomach. 1. Recording the clinical details including age, sex, etc., 2. Noting gross appearance of the lesions and in case of gastroscopy specimens, the site, size and nature of the lesion noted. 3. Histopathological features. 4. Histo-chemistry.

Among the total 23717 surgical specimens recorded during the period from 2007 to 2015 in the department of pathology RIMS, 4846 cases (20.43%) were found to be malignancies. Total G.I.T. lesions 2868 (12.09%), 968 (04.08%) belonged to GIT malignancies, 381 (1.06%) stomach malignancies. Stomach malignancies among G.I.T. malignancies (39.36%) (Table3). Resection specimen are 131, endoscopic biopsies are 210 and 40 for second opinion. Out of 381 malignant lesions Males were 283 and Females 98. The male to female

ratio was about 3:1. Highest incidence of stomach malignancies noticed in the age group of 31-70 years with a peak in the 51-60 age group (128cases, 33.59%) followed by 41-50 age group (82 cases, 21.5%) and 61-70 age group (81cases, 21.25%) (Table1). The youngest and oldest patient was a male. The socio economic status of patients noted. 82.25% of the patients are poor socio economic status income less than Rs.40000/- per year. 75.80% of the patients are from rural areas. The rural to urban ratio is 3.1: 1. The dietary habits, smoking, alcohol consumption among patients were noted. Mixed diet (83.87%), vegetarian diet (16.13%), smokers (69.35%), non smokers (30.65%), Alcohol consumption including occasional alcohol consumption in 54.83% and non alcoholic patients 45.16%. For all the 381 gastric malignancies blood groups were recorded and the distributions noted as follows- O group cases 36.48%; group-A cases 28.87%; B group cases 29.92%; AB group 18 cases 4.72%.

The symptoms noted in the 381 cases of stomach malignancies diagnosed are epigastric pain 75.80%, loss of weight 70.90%, loss of appetite 53.20%, lump in the abdomen 46.80%, vomiting 32.25%, haematemesis 5.6%, malaena 1.6%, recent dyspepsia 4.80%, dysphagia 3.20% and jaundice 1.6% etc. Epigastric pain was the most common symptom. Anorexia followed by loss of weight. Majority of the cases (75%) had symptoms less than six months duration and 82% had less than one year duration before diagnosis. The most common sign was lump palpable in the epigastric region 58% followed by anaemia 53.2%, visible peristalsis 29.8%, cachexia 9.7%, hepatomegaly(secondaries) 22.60%, ascites 4.8% and cervical lymph node enlargement 4.00%. All the 131 resection specimens were analysed on gross appearance into nodular ulcerating- (47.6%); polypoidal and fungating (33.3%); linitis plastica (19.1%). The ulcerative type was the most common type of gross appearance followed by polypoidal and fungating and linitis plastica. In the ulcerative variety (figure3) the tumour is only slightly elevated; the edges of the ulcers are rounded and its diameter varies from 0.5 cm to 3 cm in size, on cut section; the surface shows marked thickening of the wall with yellow flecks of necrosis, sometimes nodular on the serous surface. In the polypoidal and fungating form, the tumour measures 1 to 6 cm in size. Cut section shows grey white tumour mass. In linitis plastica, no ulcer or growth is seen and the entire stomach is involved, stomach very small and very thick walled , the wall is about 1" thick and stiff and rigid, the mucosa firmly tacked down to the underlying muscle coat, the thickness abruptly stopped at pyloric ring.(figure1). Depending on the relative amount of mucin secreted and desmoplastic reaction elicited, the tumours have a fleshy and fibrous or gelatinous appearance (fig2) on cut section.

All the 381 gastric malignancies were analysed by histopathology, by using WHO histological classification 2010 for gastric neoplasm. The lesions showed the following distribution: adenocarcinomas 344 (90.29%), squamous cell carcinoma of cardiac end 16 (4.20%), carcinoid 8 (2.10%), lymphomas 7 (1.84%) and GISTs 3 (0.79%) (Table 2). Microscopically **Adenocarcinomas** are graded as well, moderate and poorly differentiated. Papillary adenocarinomas were characterised by numerous papillary processes with fibrovascular cores, the tubular adenocarcinoma being composed of predominantly neoplastic tubules showing irregular branching and anastomosis. In the well differentiated tumours (fig4&5), the cells are columnar and mucin secreting with malignant change. Papillary, tubular, mucinous and signet ring types of histopathological patterns were seen. The tumours with more than 50% mucin were designated as mucinous adenocarcinomas characterized by conspicuous amounts of mucin extra cellularly. Adenocarinomas with more than 50% signet ring cell arrangement were diagnosed as a signet ring adenocarinomas characterized by single cells or small cluster of cells containing intra cytoplasmic mucin vacuoles (fig6). Majority of the adenocarinomas of stomach showed infiltration into the sub mucosa and muscularis mucosa and in some of the cases even up to the serosa. Both diffuse and intestinal type noticed. In the diffuse type, consist mainly of scattered individual cells or clusters of cells, glandular differentiation is uncommon. In the intestinal type shows well defined glandular structures with papillae, tubules or solid areas, inflammatory infiltration of stomach is common. The lining epithelium of the glands shows intestinal type of tall columnar cells and scattered mucin secreting goblet cells (figure4). Pyloric end and antrum are the most common sites in the stomach (85.5%).

All the 8 cases (2.10%) **gastric carcinoids** are diagnosed on the histological appearance. The cells arranged in micro glandular and insular pattern with the uniform size with round to oval vesicular nuclei with clear cytoplasm. The nuclei are regular and normochromatic. Scanty mitosis and absence of necrosis were observed (figure7). **Gastric lymphoma** was diagnosed in 07 cases (1.84%). By histology it was diagnosed as non Hodgkin's type of lymphoma (fig 10, 11, 12). The important diagnostic sign was infiltration of glandular epithelium by neoplastic lymphocytes. **The GISTS** 03 cases (0.79%), **squamous cell carcinomas** 16 (4.20%) and other variants Cardiopyloric gland carcinoma, Cloacogenic carcinoma and Carcinosarcoma 01 case (0.26%) each were encountered in the present study.

4. Results/Discussion

The prevalence of digestive tract malignancies from different geographic areas in India varies from a maximum 26.5% in Mangalore to a minimum of 7.5% in Amritsar (Table -3). The incidence in this study is 16.07% which is similar as reported by pay master in 1964 from Jodhpur-16.9%, Baruah, 1964 from Dibrugarh-14.9% and Leena Devi 1980(37) from North kerala-14.36%. But it is much lower when compared to Pay Master 1964 from Mangalore-26.5%, report of Bombay registry 1966 from Bombay -23.3% and Nareala et al 1963 from Vallore -19.9%. The incidence observed in our study is higher when compared to those of Reddy, Reddy & Rao 1967 from Kurnool-12.6%, Pay Master 1964 from Madras -12%,Pay Master 1964 from All India-10.2%, Gauri Bajaj-Malik et al (38)from Delhi-9.94%, Khodeskar et al, 1982 (39)from Nagpur-9.22%. Pay Master 1964 from Ahmedabad -9.0%, Sabharwal et al 1975 (40) from Ludhiana-8.35% and Chitkara et al 1966 from Amritsara -7.5%.

Gastric carcinomas may arise anywhere from cardiac end of stomach to pylorus. Nearly one half of the cases arose within 4 cm of pylorus in the series reported by Monafo et al 1962. Gangadharan&Reddy 1962 (41) in 60% cases and Lumpkin et al1964 (42) in 70% of their cases found gastric carcinoma arising in the pyloric antrum. In the extensive analysis of 5441 cases by Brookes et al 1965 (43) the site was unspecified in 2800 cases, but out of the specified sites, 50% of the tumours arose in the pyloric antrum. In the series of long term survivors reported by Remine et al 1969(44) approximately 46% of the lesions were located in distal half of stomach. Sharma 1974 (45) recorded 54.9% gastric carcinomas in pyloric antrum. In our series carcinoma arose in pyloric antrum in 59.4% of the cases.Thus it appears that pyloric antrum is the commonest site of carcinoma in the stomach.

The incidence for gastric malignancy from different places of India among G.I.T. malignancies varies from 48.05% to 62.44% (48.05% in Bombay, Pay Master 1964; 54.7% Madras; and 62.44% in Mangalore). Pay master reported an incidence of 41.38% for the whole country for stomach. The incidence of 39.36% observed in this study is lower than the overall incidence for the country and is almost the same as that observed in Hyderabad (39.31%) by pay master. With respect to other countries, the maximum incidence is reported in Japan 84.78% followed by Saudi Arabia 72.97, Singapore 77.47% and 39.22% in Lebanon and in China 48.28%. Commonly encountered malignancy in this series was Adenocarcinoma 344 cases, 90.29%, followed by squamous cell carcinoma 16 (4.20%), carcinoid 8 cases (2.10%) and lymphoma 7 case (1.84%) (Table3). This distribution observed by us is similar to Sabharwal from Ludhiana.

In the present study the frequency of gastric malignancy was highest in the age group of 51-60 years (33.56%), the age groups 41-50, 51-60 and 61-70 together accounted for 76.38% of cases (Table1). Similar observations noted from North Kerala (79.76%) by Leena Devi. The youngest (20years) and older(84years) case was a male in our study. The highest age incidence observed goes well with the previous observations from India (45). The same can be said about the sex distribution in our study group, the male to female ratio being 3:1 (Table 1). The commonest location of the malignancy in the stomach is at pyloric end (62.73%) followed by antrum (26.51%), body of stomach (6.04%) and cardiac end (4.72%) seen in 131 resection specimens out of 381 cases in this series. Similar observations reported by ML Mehrotra et al (46). In both the series the commonest lesion occurrence was in pyloric end and antrum.

The gross presentation of the 131 resection specimens of stomach out of 381 in the present series is variable and the ulcerating variety is the most frequent 63 cases (48.10%) followed by polypoid and fungating, 43 cases (32.82%) and least diffuse/ linitis plastica 25 cases (19.08%). There is a wide difference in the nomenclature used to denote the same nature of growth and so no definite carcinoma can be arrived upon about the frequency of various gross forms. It appears that the ulcerative carcinoma is the most frequent gross form. Moorie & Mortan found papillary type of tumour in 49%, ulcerating in 47% and linitis plastica in 4% of their cases. Ulcerating appearance accounted for 72% and 58.8% of gastric carcinoma in the series reported by Gangaharan & Reddy and Shivanagamani et al (47) respectively. Inlow et al (48) found ulcerative type of growth in 40% and polypoidal growth in 10% of their cases. The patients with blood group A, 110 cases(28.87%) were commonly affected followed by B group 114 cases (29.92%), O group 139 cases (36.48%) and AB group 18cases (04.72%) which is similar to other studies.

The microscopic pathology of gastric carcinoma is of greater interest because of conflicting views regarding its reliability in assessing biological behaviour and its unitary or divisible nature. Steiner et al 1948 pointed out that histological grading has not been very hopeful in estimating the prognosis in gastric cancers. Hoerr et al (49) stated that a clinicopathological classification based on the presence or absence of metastasis is better guide than histopahtological features. Welch and Wikins (50) on the other hand emphasized that microscopic study will remain the most accurate prognostic method. They found that adenocarcinoma of stomach becomes more fatal as the degree of differentiation decreases.

Stout (19) emphasized on the unitary nature of this entity and stated that there are no well defined criteria to differentiate various types of gastric carcinoma. Evan 1948 stated that any attempt to grade or categorize gastric carcinomas which are of such diverse degrees of differentiation and patterns is of little help in evaluating its behaviour. Contrary to this Lauren 1965 categorized gastric carcinomas into two distinct microscopic types, intestinal and diffuses types. He found distinctive differences in patients having these two types of gastric carcinoma regarding age, sex and biological behaviour of the tumour. Kubo (16) also recognized these distinct microscopic types of gastric carcinomas and found that in the high incidence population of Japan, there was a predominance of younger patients with diffuse carcinoma. Increased incidence of intestinal type among the aged and diffuse carcinoma in younger patients was also recorded by kim et al 1972.

In the present study of 344 cases of gastric epithelial tumours out of 381, we have found that following Lauren's criteria, most of the gastric carcinomas can be categorized into intestinal and diffuse types. And intestinal type is 4.25 times more common in men than women. Similar reports were observed by Stalberg 1972 and Mehrotra et al 1975. We also tried to see if any relationship exists between gross forms and their microscopic type of gastric carcinoma. It is evident from the present series that there is no significant correlation between the two except that Linitis plastica presents the diffuse microscopic type more commonly than the intestinal type. Thus it would appear from the present study that there are grounds to substantiate the Lauren's concept of dividing gastric carcinomas into intestinal and diffuse types.

Incidence and localization of primary GI lymphomas varies worldwide. The GI lymphomas in adults arise predominantly in the stomach whereas intestinal malignant lymphomas are rather infrequent and show no site prevalence in the bowel. Clinically almost all patients presented with GI symptoms

preceding the diagnosis by an average of 4 months. The endoscopic appearance in general was not pathognomonic for a lymphomatous infiltration, resembling atypical mucosal folding, erosive gastritis or ulceration. However, the macroscopic aspect of vegetation, thickening of the gastric mucosa and arresting the motility of the gastric wall pointed to lymphoma. Gauri Bazaz and Malik et al reported six cases of lymphoma out of 324 malignant cases (1.85%) from Delhi with a distribution of stomach 2 cases, small intestine 3 cases and colon 1 case. Leena Devi et al reported six cases out of 260 (2.3%). In the present series 7 cases out of 381 cases (1.84%) observed. No regional lymph nodes or other lymph nodes involved. Non Hodgkin's lymphoma was the commonest malignant lymphoma. The incidence of carcinoid is 8 cases (2.10%) observed. Gauri Bajaj and Mali et al reported 5 cases out of 324 cases; one in the stomach, three in the small intestine and one in colon. In our study the gastric carcinoid is common than other series. None of the patients in the present study exhibited carcinoid syndrome. Gastrointestinal malignant stromal tumours are relatively uncommon neoplasms of stomach (1-3%), small intestine (20%) and large intestine (1 1%). In our study 3 cases reported from stomach. IHC S100 positivity, Actin positivity observed. In our study the mucin secreted by the intestinal gastric carcinoma showed positive for PAS stain. Accurate histopathology of malignant tumours of stomach is essential to plan the mode of treatment and to assess the prognosis. The prognosis in case of lymphoma has been observed to be better. In case of adenocarinomas, mucin producing form has been observed to have worse prognosis because of extensive spread.

5. Conclusion

381 malignant tumours of stomach seen during the period 2007-2015 in the department of pathology are reviewed and their prevalence of site distribution and relationship to age, sex, socioeconomic status, alcohol consumption, smoking, diet, blood groups and histopathological characteristics studied. Adenocarcinoma of stomach was found to be the commonest malignant tumour (90.29%). The peak incidence is noted in the age group of 51-60 years age group with male predominance. In the case of Adenocarinoma, intestinal type (64.6%) was observed predominantly. The risk factors are low socioeconomic patients, blood group A, alcohol consumption and smoking. The commonest symptom is epigastric pain and common signs are epigastric lump and anaemia. Almost all squamous cell carcinoma occurred in the gastro-oesophageal junction 16(%). Carcinoid 8 cases (2.10%), Non Hodgkin's lymphomas 7 cases (1.84%) were observed in stomach.

6. Future Scope

In the majority of patients the symptoms and signs are not definitive and a high index of suspicion is necessary to exclude carcinoma of stomach. As the disease presents itself late with a long latent period, in suspicious cases and high risk cases early screening is indicated for early diagnosis and to give better treatment with latest modalities.

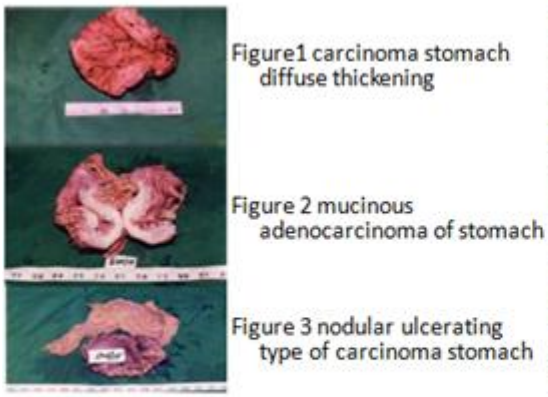

Figure1 carcinoma stomach diffuse thickening

Figure 2 mucinous adenocarcinoma of stomach

Figure 3 nodular ulcerating type of carcinoma stomach

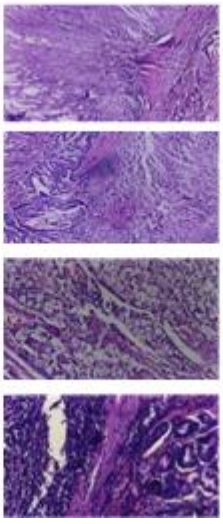

Figure 4.Adenocarcinoma intestinal type H&E 50

Figure 5.Adenocarcinoma well differentiated H&E 50

Figure 6.Adenocarcinoma signet ringtype H&E400

Figure 7. Carcinoid of stomach H&E200

Table 1: Malignant tumours of stomach 381, age and sex distribution

Age	Male	Female
01-20	02	-----
21-30	03	10
31-40	26	18
41-50	61	21
51-60	106	22
61-70	61	20
71-80	22	07
81-90	02	00
Total 381	283	98

Table 2: Stomach malignant tumours distribution-histological pattern of 381 cases

Histological type	Stomach
Adenocarcinoma	344(90.29%)
Lymphoma	07(1.84%)
Carcinoid	08(2.10%)
GISTS	03(0.79%)
Squamous cell carcinoma	16(4.20%)
Cardiaopyloric gland carcinoma	01(0.26%)
Cloacogenic carcinoma	01(0.26%)
Carcinosarcoma	01(0.26%)
Total	381(100.00%)

Table 3: Malignant tumours of stomach incidence in different places of India

Place	Author	Year	Percentage
India	Pay master	1964	10.02
Mangalore	Pay master	1964	26.5
Amritsar	Chitkara et al	1966	07.5
North Kerala	Leena Devi et al	1980	14.36
Nagpur	Khodeskar et al	1982	09.22
Delhi	Gauri bajaj et al	1984	09.94
Kadapa (Present study)		2015	16.07

Table 4: Stomach malignancies among GIT malignancies in India

Place	Author	Year	Percentage
India	Pay master	1964	41.38
Ludhiana	Sabharwal et al	1975	09.36
Nagpur	Khodeskar et al	1982	22.50
Delhi	Gauri bajaj et al	1984	12.05
kadapa (present study)		2015	39.36

Table 5: malignant tumours of stomach-blood group distribution

Blood group	Number	Percentage
Group O	139	36.48(40)*
Group A	110	28.87(22)
Group B	114	29.92(33)
Group AB	018	04.72(5)
TOTAL	381	100(100)

*figures in brackets denote % in general population

References

[1] Jussawala DJ and Bhansali SK, cancer in the tropics A comparative study with special reference to India, Ind.J.Cancer 6:1-26, 1969.
[2] Parkin DM, Pisani P, Ferlay J. Estimates of the world wide incidence of eighteen major cancers in 1985. Int.J. Cancer 1993;55:594-606.
[3] Landis SH, et al Cancer statistics CA 48:6, 1998 cancer incidence and mortality by site and sex.
[4] Napalkov MP, Tserkor GF, Merabishuli VM, et al eds. Cancer incidence in the USSR (Supplement to cancer incidence in five continents, Vol-III) IARC Sci.pub. 1983;48.
[5] Parsonnet J, Friedman GD, Vandusteen DP et al. Helicobactor pylori infection and the risk of gastric cancer N.Engl.J Med. 1991;1127-31.
[6] Parkin DM, International variation. Oncogene 2004; 23:6329-40.
[7] Ferlay J, Shin HR, Bray F, et al. Estimates of worldwide burden of cancer in 2008: GLOBOCAN 2008.Int.J.cancer 2010;127:2893-917.
[8] 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.
[9] Blot WJ, Devesa SS, Kneller RW, et al. Rising incidence of adenocarcinoma of the esophagus and gastric cardia. JAMA 1991;265:1287-9.
[10] Jemal A, Bray F, Center MM, et al. Global cancer statistics. CA Cancer J. Clin. 2011;61:69-90
[11] Lauren P: the two histological main types of gastric carcinoma. Diffuse and so called intestinal type carcinoma. Acta pathol Microbiol scand 64: 31-49, 1965.
[12] Ming-SC: Gastric carcinoma. A Pathobiological classification: cancer 39:2475-2485, 1977.
[13] Hoerr,S.O et al: Prognosis in carcinoma of stomach in relation to microscopic type. Surg.Gyn.Ob.122, 485, 1966.
[14] Segi M, &Kurihara, M: Cancer mortality for selected sites in 24 countries No.4, Sendai Japah, Dept of Public Health Tohoko University School of Medicine, 1966.
[15] Dungall, N: The special problem of stomach cancer in Iceland JAMA 178:789-798, 1961.
[16] Kubo, T: Histologic appearance of gastric carcinoma in high and low mortality countries. Cancer 28, 726, 1973.
[17] Hill et al : Etiology of Gastric carcinoma, 1973.
[18] Aird & Bentall H.H, 1953: A relationship between cancer of stomach and the ABO blood groups.Br.Med.J1, 799-801.
[19] Stout A.P: Tumours of the Stomach. In Atlas of Tumour Pathology Sect.VI, Fasl 21, Washington DC 1953 Armed Forces Institute of Pathology.
[20] Mulligan RM: Histogenesis, Biological behaviour of gastric carcinoma, Path Ann 7:349-415, 1975.
[21] Stemmerman GN et al 1974: A survival study of intestinal and diffuse types of gastric carcinoma. Cancer 33, 1190-1195.
[22] Kennedy, BJ, 1970 TNM classification for stomach cancer. Cancer 26,971-983.
[23] Murakami T, 1971 Pathomorphological diagnosis-definition and gross classification of early gastric cancer – cancer research 11, IP 53-55.
[24] Mason, MK 1965, Surface carcinoma of the stomach Gut, 6, 185-193.
[25] Friesen G, Dockesty MB&Remine WH, 1962: Superficial carcinoma of the stomach. Surg. 51, 300-312.
[26] Johansen, AA 1976. Early Gastric cancer- In Pathology of the Gastrointestinal tract, current topics in pathology ed Morson BC. Vol 63, PP 1-47.
[27] Filipe MI: Mucins in the human gastro intestinal epithelium – A review, Invest cell path-2:195-216, 1979.
[28] Mori M et al 1986 Adenosquamous carcinoma of stomach – A cinicopathologic analysis of 28 cases, cancer 57,: 333-339.
[29] Ishikura H, et al – An AFP producing gastric carcinoma with feature of hepatic differentiation a case report cancer 56; 840-848.
[30] Yakaishi, Y et al 1990 distribution of beta human chorionic gonadotrophin positive cells in non cancerous gastric mucosa and in malignant gastric tumours. Cancer 66, 695-701.
[31] Rindu . G et al 1993, three sub types of gastric argyrophil carcinoid and the neuro endocrine carcinoma – A cinico pathologic study, Gastroenterology 104, 994-1006.
[32] Wotherspoon AC et al – Helicobactor pylori associated gastritis- and primary B cell gastric lymphoma . Cancer 338:1175-1176, 1991.
[33] Issacson PG et al – Is gastric lymphoma an infectious disease? Hum.path24:569-570, 1994.

[34] Chan JKC et al 1990: Relationship between high grade lymphoma and low grade B cell MALTOMA of stomach. Am J.Path.136:1153-1164.
[35] Kuiper DH, Gracie WAJ, polland HM. Twenty years of gastrointestinal carcinoids. Cancer 1970;25:1424-1430.
[36] Yamin M. Zakariai MJ et al, Carcinoid Tumours of the GIT – Cancer 35:588-591, 1975.
[37] Leena Devi KR et al., Pattern of gastrointestinal tumours in North Kerala. Ind.J. Cancer.1980;17:159-163.
[38] Gauri-Bazaz-Malik et al., Malignant tumours of digestive tract- A twenty five years study, Indian J.Path.Micr. july,1989.180-185.
[39] Khodaskar, MB et al.,- A study of carcinoid tumours of GIT-Indian J.Path.Micro. 26:171-176, 1983.
[40] Sabharwal BD et al., Gastrointestinal malignancies in Ludhiana Feb.1975;64(3):57-60.
[41] Gangadharan, D and Reddy DM: Carcinoma of stomach, Indian J.Path and Bact.5,80, 1962.
[42] Lumpkin. WM et al.,: Carcinoma of stomach: Review of 1035 cases Ann.Sur.159, 919, 1964.
[43] Brookes US et al: Carcinoma of stomach 10 year survey of results and of factors affect of prognosis: Br.Med.J. 1577, 1965.
[44] Remine WH et al: Long term survivals (10-56years) after surgery for carcinoma of the stomach, Am.J.Surg. 117, 1969.
[45] Sharma OP: Study of gastric carcinoma (377 cases) Ind.J.Cancer,11, 406, 1974.
[46] M.L. Mehrotra et al: Gastric carcinoma –An Entity-Unitary or Divisible. Indian J.path&Micro.1975, 223-232.
[47] Shiva Nagamani, K et al: carcinoma stomach-A study of 200 cases.Indian.J.Cancer 11, 437-, 1974.
[48] Inlow, RP et al1993: Large Gastric cancers, Surg.Gyn.&Obst. 120,725, 1965.
[49] Hoerr, SO et al: Prognosis in Carcinoma of stomach in relation to microscopic type.Surg.Gyn.Ob.122, 485, 1966.
[50] Welch, CE and Wilkims EW: Carcinoma of the stomach. Ann.Sug.148,666, 1958.

Author Profile

Dr. Y. Subrahmanyam, MD, Associate professor, Department of Pathology, RIMS- Kadapa & Ongole. Mailing Address: Dr. Y. Subrahmanyam, MD, 10-15-17/3, K.K.Layout, Tirupati-517501, A.P., India

Dr. K. Suneetha, MD, Assistant Professor, Department of Pathology, RIMS-ONGOLE, A.P., India