

## Hospital Based Incidence of Various Colorectal Carcinoma: The Clinical and Pathological Staging

Dr. Khatija Shameem<sup>1</sup>, Dr. H. Lakshmi Vasavi<sup>2</sup>

<sup>1</sup>Deccan College of Medical Sciences, Hyderabad

<sup>2</sup>GMC, SRIKAKULAM

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Corresponding Author:

**Dr. H. Lakshmi**

**Vasavi**

GMC, SRIKAKULAM

### ABSTRACT

Colorectal cancer (CRC), also known as bowel cancer and colon cancer, is the development of cancer from the colon or rectum (parts of the large intestine). A cancer is the abnormal growth of cells that have the ability to invade or spread to other parts of the body. Colorectal carcinoma is the second leading cause of cancer death. The Present Study aimed to know the hospital based incidence of various types of Colorectal carcinoma with the different his opathological variants to know the significance of staging in prognosis.

### INTRODUCTION

Colorectal carcinoma is the second leading cause of cancer death, overall after lung cancer. The lifetime risk for the development of carcinoma is nearly 6%. Recent data suggest the incidence of colorectal carcinoma is 33.7% per 100000 and 12.8% per 100 000 for rectal carcinoma<sup>1</sup> According to the American Cancer Society about 104,950 new cases of colon cancer and 40,340 new cases of rectal cancer were reported in 2005 in the United States combined, the two cancer types have caused about 56,290 deaths<sup>2</sup> According to the World Health Organization's April 2003 report on global cancer rates more than 940,000 new cases of colorectal cancer and nearly 500,000 deaths are reported worldwide each year. There is also significant global variation in the risk of colorectal carcinoma as well as significant differences with regard to regional and ethnic background. Recent data demonstrate a decrease in incidence rates of colorectal carcinoma in whites since the mid 1980s, particularly for the distal colon and rectum. Proximal colon carcinoma rates in blacks are considerably higher than in whites and continue to increase, whereas rates in whites show signs of decline.

Incidence of colon carcinoma is highly variable worldwide most common in northwest Europe, North America and Australia and low in Africa, Asia, and some parts of South America in United States it is by far the most common and most curable carcinoma of the gastrointestinal tract. However the incidence is rising in countries that are adopting western lifestyle, for example Japan<sup>4</sup> In North America and Western Europe the incidence is 30-55/per 100,000 by contrast in Africa it is only 5 per 100,000 .epidemiologic studies indicate that the etiology of sporadic colorectal carcinoma is closely related to the environmental factors with genetic factors playing an important but less obvious role. The former are largely dietary particularly in terms of fats and animal proteins and lack of fibre and fresh vegetables.<sup>5</sup> one hypothesis indicates that excess dietary fat may result in increased production of bile acids which may

themselves be carcinogenic or may be converted to carcinogen by the action of bacteria in the bowel lumen. Male sex, increasing age presence of long standing IBD and familial predisposition are strong risk factors. The mean age of incidence is 62 years. Cancer is mostly age related, the incidence rising progressively with increasing age. In high risk areas 8% of patients present under the age of 50 years prognosis of young patient differ from that of more elderly subjects.<sup>6</sup> The incidence is little higher in males than females. Cancer of right colon is more frequent in females of all ages. Cancer of left colon is more frequent in females under the age of 50 years and more frequently in males over the age of 70 years. Cancer of right colon is age dependant in both males and females. In males 40% occur in rectum, 30% occur in left colon and 30% in right colon. In females 40 % occur in right colon, 30% in left colon and 30% in rectum<sup>7</sup>

### MATERIAL AND METHODS

The present study was conducted at MNJ cancer hospital, Hyderabad for a period starting from July 2014 to June 2017. A 3 years study was done taking into account all the clinical details of the patients retrieved from the medical records section in the hospital. The clinical features, laboratory data, and detailed pathological examination of each case were analyzed. The lesions were fixed in 10% formalin; and after careful observation with the naked eye, the lesion was cut into sections and stained with hematoxylin and eosin (H&E). All the slides were reviewed and the sections were examined histologically. The following staining procedures were also adopted. Special stains done for few cases where required. Haematoxylin and eosin staining and results Nucleus – blue, cytoplasm – pink ,PAS staining for mucins results with hematoxylin counter stain nuclei are blue, pas positive materials are magenta (purple red). alcian blue – pas staining for acid and neutral mucins results acid mucin blue, neutral mucin – magenta. Mixtures of the color will depend on the above. Dominant

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entity and will range from blue – purple through purple to violet or mauve color. Nuclei pale blue. The full clinical history was taken into account before the final report was issued. Tumors were classified according to Dukes classification.

### RESULTS

The present study of colorectal carcinoma was undertaken at Department of pathology at MNJ cancer Hospital, Hyderabad for a period of three years (July 2014 – June 2017) and the observations are recorded below:

**Table 1:** Laboratory statistics of MNJ cancer Hospital from July 2003 – June 2006.

Period	Total no of surgical specimens	Colorectal
July 2014 – June 2015	2837	35
July 2015 – June 2016	3053	52
July 2016 – June 2017	2972	47
Total	8862	134

**Table 2:** Year wise statistics of adenocarcinoma:

Age	1-10	11-20	21-30	31-40	41-50	51-60	61-70	71-80
2014-2015	-	-	4	8	12	8	10	2
2015-2016	-	1	5	12	14	12	9	1
2016-2017	-	-	2	10	8	10	4	2

**Table 3:** The comparison of complaints with other study:

Complaints	Hamilton et al 1998-2002	Present Study	Percentage
Bleeding per rectum	148	102	76.12%
Pain in the abdomen	148	69	52.1%
Anemia	78	51	38.3%
Altered bowel habits	132	37	28.1%
Blood and mucus in stools	-	23	17.8%
Anorexia, loss of weight	94	9	7.2%

**Table 4:** Site and year wise incidence of colorectal cancers in present study:

Site	July 2014- June 2015	July2015- June 2016	July 2016- June 2017	Total	Percentage
Rectum	19	28	28	75	55.96
Recto sigmoid	4	4	7	15	9.61
Sigmoid Colon	3	5	2	10	7.45
Transverse Colon	3	7	6	16	11.94
Ascending Colon M	1	2	1	4	3
Caecum	2	2	1	5	3.73
Splenic Flexure	1	0	0	1	0.7
Hepatic Flexure	0	1	0	1	0.7
Anal Canal	1	3	2	6	4.46
Appendix	1	0	0	1	0.7
Total	35	52	47	134	100%

**Table 5:** Comparison of site wise incidence of other study with present study:

Site	Study Ponz de Leon 1993-1998	Present Study July 2014- June2016
Cecum	7.02%	3.73%
Appendix	1.1 %	0.70%
ascending colon	13.14%	3%
hepatic flexure	1.3%	0.70%
transverse colon	11.14%	11.89%
splenic flexure	1.1%	0.70%
descending colon	8.14%	0.70%
sigmoid colon	30.67%	9.69%
Rectum	24.13%	62.66%
anal canal	1.19%	4.46%
Total cases Observed	626	134

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**Table 6:** Age wise incidence in the study period:

Age	1-10	11-20	21-30	31-40	41-50	51-60	61-70	71-80
2014-2015	-	-	4	8	12	8	10	2
2015-2016	-	1	5	12	14	12	9	1
2016-2017	-	-	2	10	8	10	4	2

**Table 7:** Sex wise incidence in the various sites each year:

Year	Sex	Rectum	Recto sigmoid junction	Sigmoid colon	Transverse colon	Ascending colon	Descending colon	Cecum	Anal canal
2014-2015	Male	17	3	3	2	0	1	2	1
	Female	11	3	1	2	0	0	2	0
2015-2016	Male	9	4	1	5			1	2
	Female	12	1	0	2				1
2016-2017	Male	13	2	3	2	3	0	0	1
	Female	13	0	2	5	2	0	1	1

**Table 8:** Gross appearance in the colon and rectum;

Site	Ulceroproliferative	fungating	Constricting	Annular / circumscribed
Rectum	38	21	6	6
Right colon	20	02	6	1
Left colon	-	09	3	-
Anal canal	2	4	-	-

**Table 9:** Staging and lymph nodes metastasis:

Staging	Rectum	colon	Total	male	Female
Early	6	4	10	8	2
Upto muscle coat	17	12	29	21	8
Invasion into serosa	41	15	54	38	16
Lymph nodes	36	20	56	43	13
Distant metastasis	1	1	2	1	1

**Table 10:** Subtypes of well differentiated colorectal cancer:

Differentiation	Total		papillary		Mucinous		Tubular	
	Cases	%	Cases	%	Cases	%	Cases	%
Well	37	29.68	9	6.7	8	5.97	20	14.92

**Table 11** Subtypes in moderately differentiated adenocarcinoma:

Differentiation	Total	Papillary	mucinous	Tubular
Moderately	87	14	11	62

**Table 12** Subtypes in poorly differentiated adenocarcinoma:

Differentiation	Total	Papillary	mucinous	Tubular
Poor	10	-	-	-

**Table 13** Mucin secreting adenocarcinoma:

No. of cases	F:M	4 th decade	5-6 decade
19	2:1	6	9

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**Table: 14** Incidence of polyps in present study:

S No.	Sex	Age	Site	Morphology of polyps
1	70	M	colon	Multiple , size ranging from 1-3 cms
2	75	M	Rectum	Multiple largest 5 cms
3	40	M	Rectum	Multiple size ranging from 2-5 cms
4	50	M	Rectum	Multiple varying sizes largest with stalk 5 cms, few are sessile.
5	25	M	Rectum	Multiple largest 4 cms
6	35	F	Rectum	Multiple largest 6 cms.

**Table: 15** Comparison of various studies:-

S No.	Analysis		Giovanni et al 1986-1995	Nobuyuki Takemoto 1996-1997	Pierro Benatti 1978-2002	Present study
1	Total No. of cases		1,265	106	1,263	134
2	SEX	Male	191	61 (57.5)	669	71
		Female	163	45 (42.5)	594	63
3	AGE	< 45	22	33 (31.1)		34
		45-60	86			64
		61-70	165	73 (68.9)		23
		>75	81			5
4	Site	Proximal colon	107	46 (43.4)	535	
		Distal colon	247	60 (56.6)	469	
		Rectum			257	
5	Size	<4	52			32
		4-7	265			84
		>7	37			18
6	Local Spread		283			
7	Lymph Node		203			56
8	Tumor stage	I			126	10
		II	185	47 (44.3)	491	
		III	111	59 (55.7)	461	29
		IV	58		184	54
9	Pattern Of Growth	Expanding	297		797	112
		Infiltrating	57		454	22
10	Grading	Well		68 (64.2)	991	38
		Moderate		27 (25.5)		87
		Poor		5 (4.7)	271	10
		Mucinous		6 (5.7)	211	19

**DISCUSSION**

The present study was conducted at M.N.J. Cancer institute, Hyderabad for a period of 3 years from July 2014 to June 2017. We have studied a total of 134 cases of colorectal carcinoma. Out of 134 malignant lesions, 128 were adenocarcinomas, 4 cases of squamous cell carcinoma and two cases of malignant melanoma. There was a marked preponderance in adenocarcinoma and the peak incidence was seen in the 4<sup>th</sup> and 5<sup>th</sup> decade. Male preponderance was seen with male to female ratio 1.2: 1. Out of the 128 cases of adenocarcinomas 37 cases were of well differentiated type (29.6%), 87 cases of moderately differentiated type

(67.96%) and 10 cases of poorly differentiated type (7.81%). Among the well differentiated and moderately differentiated adenocarcinomas (125), there were 23 cases of papillary adenocarcinoma ( 18.4 %), 19 cases ( 15.2 %) of mucin secreting adenocarcinoma and 66 cases of tubular adenocarcinoma (65.3%). For all the 19 cases of mucin secreting adenocarcinomas and adenocarcinoma, special stains, PAS and Alcian blue was done to demonstrate mucin.

Mucinous carcinoma is defined by more than or equal to 50% mucin in the section studied (Green JB. Timmcke AE 1993). Incidence of mucin secreting adenocarcinoma in our study is (15.2%), it is near to the

study of consorti F. Lorenzotti A, Midiri G. Dipaolam (2000)<sup>8</sup> has studied 248 cases of adenocarcinomas of which 29 cases were of mucinous carcinomas (11.69%). In the present study the malignancies of the intestines formed 1.51 % of all the malignancies. Majority of the malignancies were seen in large intestine. Homji and gangadharan (1972) from Tata institute of Cancer have reported large intestinal malignancies in 2.1% of malignancies. In our study, the maximum number of cases were recorded in the rectum (75%) (Table: 17 and 18). According to study conducted by Giovanni et al,<sup>55</sup> Pierro Bennatti et al, showed 20.34 % , 19.05 % respectively. This variation of percentage incidence may be due to the fact that in the western countries or Westernized parts of developing countries, the diet may vary which is one of the factors responsible for high incidence of cancer seen in developing countries (Burkitt 1971) Another study conducted by Ponz de Leon<sup>52</sup> also recorded only 26.03 % involvement of rectal region.

The colon is the next common site of involvement of malignancies forming 28.35% (38 cases) of the large gut malignancies. This incidence is in accordance to the view that in India carcinoma of rectum and anal canal is seen more frequently than the carcinoma of the colon in general (Paymaster 1964: Kapur et al) Ponz de Leon<sup>52</sup>(2004) 49 recorded 52.2% in that region. Giovanni recorded 8.74% involvement of the proximal colon. In the present investigations single tumor was seen in splenic flexure area. Similarly the series recorded by Ponz de Leon recorded 1.3 %-incidence from this region. The cecum was the site of lesser percentage of malignancies (3.73%), although. Ponz de Leon(2004) recorded 8.1% from that region. The average age incidence of the malignancies in the large gut was 51 years in the rectum 45 years in the rectosigmoid, 45 years in the colon and 50 years in the anal canal. Ponz de Leon recorded the incidence as 65 years for rectal lesion, 60 years for colon and 70 years in the rectosigmoid region and 64 years in the anal canal region. It has been said that due to malnutrition and other factors the malignancies occur at an earlier age among the Indians.

## CONCLUSION

Colorectal carcinoma is leading cause of cancer and deaths from carcinoma. There is a marked increase in the incidence of colorectal carcinoma in the 40-60 year old age group shown in the present study necessitates a more detailed work up in younger age group. Only 6 cases of adenomatous polyps were seen in our study as compared to

the West where the polyps are most commonly associated with adenocarcinoma. Rare variants of adenocarcinoma which logically must be identified as the treatment and prognosis differs in all the cases. To conclude the need for application of MUCIN histochemistry and other relevant special stains is re-emphasized.

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