Research Article

Spectrum of Colorectal Lesions on Colonoscopic Biopsies; a Histopathological Study in a Tertiary Care Hospital.

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ABSTRACT:

BACKGROUND: A variety of lesions affect large bowel which include both neoplastic and non- neoplastic pathologies,with some of the inflammatory diseases being premalignant. Due to vague symptoms, the clinical diagnosis is usually delayed. A battery of laboratory tests including biopsy is essential to arrive at a specific diagnosis for appropriate management.

AIMS: To study the histopathological spectrum of lesions of colon and rectum on colonoscopic biopsies.

MATERIALS AND METHODS: The present study was undertaken in the Department of Pathology, Government Medical College, Srinagar over a one year period from October 2015 to October 2016. A total of two hundred and eighty four (284) colorectal biopsies were included in the present study. All tissues were fixed in formalin, stained with H&E and special stains like Periodic Acid Schiff (PAS), Reticulin, Zeihl Neelsen (ZN) along with Immunohistochemistry (IHC) were done as and when required.

RESULTS: Out of total 284 cases, 113 were non-neoplastic and 171 were neoplastic. In our study we observed that neoplastic lesions predominated over non-neoplastic lesion. Of 171 neoplastic lesions, 60 were benign and 111 were malignant. Malignant lesions were more in number than the benign lesions in our study. Out of a total of 284 colorectal lesions 180 (63.38%) were present in males and 104 (36.62%) were present in females with male to female ratio being 1.73:1. Non specific colitis was the commonest type seen among non-neoplastic lesions. Tubular adenoma was the most common benign neoplastic lesion and moderately differentiated adenocarcinoma was the commonest malignancy seen. Rectum was the most common site for malignant lesions.

CONCLUSION: We observed that neoplastic lesions were more common than non-neoplastic lesions in large intestine. Present study emphasizes the need for early histopathological diagnosis for appropriate treatment

INTRODUCTION

A variety of neoplastic and non-neoplastic disorders affect the large bowel and anal canal which are commonly encountered in clinical practice. These conditions encompass a spectrum of acute and chronic conditions (1,2). They can be sites for infections, vascular disorders, ulcers, various inflammatory conditions and neoplasms which often require colonoscopic biopsy for their final diagnosis (3,4).

The similarity of pathological changes in Ulcerative colitis, Crohn's disease and other intestinal inflammation causes considerable diagnostic confusion and uncertainty. Effective management, however, depends on accurate clinico-pathological diagnosis (5). Specific histological features together with their distribution can reliably diagnose inflammatory bowel disease, distinguish Crohn's disease from Ulcerative colitis and provides an estimate of the probability of the underlying disease being present(6).

Examination of colorectal biopsy specimen is a reliable method for diagnosing inflammatory bowel disease (7) though many factors lead to variation in biopsy interpretation between reporting histopathologists (8).

Epithelial tumors are a major cause of morbidity & mortality worldwide. Colorectal cancer is the fourth ranking cancer worldwide, accounting for approximately 9% of all cancers (9). Colonoscopy is currently considered to be gold standard for cancer surveillance (10). Adenocarcinomas are the commonest malignancies arising in the colorectal region, other being carcinoid, anal canal carcinoma & melanoma.

Colonoscopy is critical to the diagnosis and management of colorectal diseases (11). The development of fibre-optic colonoscope has enabled the clinician to visualize the mucosa of the rectum, entire colon and terminal ileum, to screen the intestinal abnormalities and to get representative biopsy for the definitive diagnosis (12). Biopsies are sought for specific diagnosis, for determining the extent of the disease and its response to therapy and for detecting complications.

Both macroscopic and microscopic appearance alongwith clinical correlation helps in definitive diagnosis of the lesion, which helps in early treatment and better outcome of the patient.

AIMS AND OBJECTIVES

The main aims and objectives of the study undertaken are:

1. To study the histopathological spectrum of lesions of colon and rectum on colonoscopic biopsies.
2. To study age, sex and site distribution of these lesions.

MATERIALS AND METHODS

The present study was undertaken in the Department of Pathology, Government Medical College, Srinagar over a one year period from October 2015 to October 2016. A total of two hundred and eighty four (284) biopsies from patients attending the Gastroenterology OPD, who presented with lower gastrointestinal tract symptoms, were included in our study. Clinical details along with a detailed description of the colonoscopic findings were obtained. An attempt was made by the clinician to give a colonoscopic diagnosis in all the cases. The samples received in our Department were collected in 10% neutral buffered formalin, processed and embedded in paraffin with the mucosal surface being uppermost. 4µ thick serial sections were prepared. All tissues were stained with H&E and special stains like Periodic Acid Schiff (PAS), Reticulin, Ziehl Neelsen (ZN) along with Immunohistochemistry (IHC) were done as and when required. The diagnosis of colorectal biopsies was made on the basis of clinical presentation, colonoscopic findings and light microscopic features of H&E and special stained sections. The lesions were classified as non-neoplastic lesions, benign neoplastic lesions and malignant tumors. The tumors were classified as per WHO classification and observations were compared with other studies.

Inclusion criteria:

All the colonoscopic biopsies taken from colon and rectum, received in the Department of Pathology irrespective of patient's age.

Exclusion criteria:

1. Poorly fixed/unfixed specimens.

2. Patients presenting with lesions in small intestine and anal canal.

3. Inadequate biopsies in terms of no mucosal glands, only fibrocollagenous tissue, etc.

STATISTICAL ANALYSIS

Statistical analysis was done with the help of SPSS version 17.0 software.

Categorical variables are expressed as frequencies and percentages. Nominal categorical data between the groups were compared using Chi-square test or Fisher's exact test as appropriate. $p<0.05$ was considered statistically significant.

RESULTS

A total of 284 colonoscopic biopsies were examined during the study period. Biopsies were performed on patients of all age groups, the youngest being a 1 year old infant and oldest being an 85 year old male. The colonoscopic biopsies were divided as non-neoplastic and neoplastic lesions. Out of a total 284 cases, 113 were non-neoplastic and 171 were neoplastic. In our study we observed that neoplastic lesions predominated over non-neoplastic lesions. Of 171 neoplastic lesions, 60 were benign and 111 were malignant. Malignant lesions were more in number than the benign lesions in our study **(Table 1).**

Out of a total of 284 colorectal lesions 180 (63.38%) were present in males and 104 (36.62%) were present in females with male to female ratio being 1.73:1.

Table 1: Distribution of lesions

Lesion	No. of cases (%)
Non-neoplastic	113 (39.78%)
Benign neoplastic	60 (21.12%)
Malignant neoplastic	111 (39.08%)
Total	284

In the present study of 284 colorectal biopsies, 113 cases were diagnosed as non-neoplastic lesions. Non specific colitis was the commonest type seen among non-neoplastic lesions with 40 cases (35.39%), followed by 15 cases of Ulcerative colitis. Non specific colitis was further subdivided into acute and chronic colitis. **(Table 2)**

Table 2: Non-neoplastic lesions

S. no	Histological Diagnosis	No. of cases (%)
1.	Chronic non-specific colitis	21 (18.58%)
2.	Acute non-specific colitis	19 (16.81%)
3.	Ulcerative colitis	15 (13.27%)
4.	Solitary rectal ulcer	12 (10.61%)
5.	Juvenile polyp	14(12.38%)
6.	Hyperplastic polyp	14(12.38%)
7	Tuberculosis	7 (6.1%)
8.	Retention polyp	5(4.4%)
9.	Crohn's disease	4 (3.5%)
10.	Hirschprung's disease	2 (1.7%)
	Total	113

In our study we observed males (67) were more in number than females (46) with a male to female ratio of 1.45:1.

The age of patients with non-neoplastic lesions ranged from 1 to 75 years. Maximum number of cases were seen in age group of 41-50 years (22 cases) followed by a second highest peak in age group of 21-30 years (20 cases). Both cases of Hirschsprung's disease were in 0-10 year age group. **(Table 3)**

Table 3: Age distribution of Non-neoplastic lesions

Age Group	Ac Non-sp colitis	Ch Non-sp colitis	Ulcerative colitis	Crohn's Disease	SRUS	TB	Hirschprung's disease	Juvenile polyp	Retention polyp	Hyperplastic polyp
0 – 10	-	-	-	-	-	-	2	9	-	1
11 – 20	2	-	1	1	1	1	-	5	3	2
21 – 30	2	7	2	2	3	2	-	-	-	3
31 – 40	4	-	3	-	3	-	-	-	-	-
41 – 50	7	4	4	1	-	4	-	-	-	2
51 – 60	2	6	3	-	4	-	-	-	-	2
61 – 70	2	3	2	-	1	-	-		2	3
71 – 80	-	1	-	-	-	-	-	-	-	1
Total	19	21	15	4	12	7	2	14	5	14

Among171 neoplastic lesions, 60 were benign lesions.Tubular adenoma and tubulovillous adenoma were the most common histological diagnosis among benign tumors. **(Table 4)**

Table 4: Benign neoplastic lesions

S. no	Histological Diagnosis	No. of cases (%)
1.	Tubular adenoma	28 (46.67.%)
2.	Tubulovillous adenoma	23 (38.33%)
3.	Villous adenoma	9 (15%)
	Total	**60**

Of 60 benign neoplastic lesions, 40(66.67%) were observed in males and 20(33.33%) in females. We observed a male predominance of these lesions with a male to female ratio of 1.82:1 in our study The age of patients with benign lesions ranged from 4-85 years with a peak incidence in age group of 61-70 years. **(Table 5)**

Table 5: Age distribution of benign lesions

Age Group	Villous adenoma	Tubular adenoma	Tubulo-villous adenoma
0 – 10	-	-	-
11 – 20	-	-	-
21 – 30	-	3	1
31 – 40	1	3	4
41 – 50	-	6	7
51 – 60	3	2	5
61 – 70	3	12	5
71 – 80	2	2	1
81 – 90	-	-	-
Total	9	28	23

We also observed that adenomas were more commonly present in sigmoid colon (23 cases) followed by rectum (12 cases).Thus adenomas showed a left sided predilection.

In the present study, out of 111 malignant lesions, 41 cases (36.94%) were Moderately differentiated adenocarcinomas, 35 cases (31.53%) were Well differentiated adenocarcinomas, 10 cases (9%) were Poorly differentiated, 11 cases (9.9%) were Mucinous adenocarcinomas, 8 cases (7.2%) were Signet ring cell carcinomas, 5 cases (4.5%) were Non-Hodgkin Lymphoma and 1 case (0.9%) was Carcinoid tumor.**(Table 6)**

Table 6: Malignant neoplastic lesions

S. no	Histological Diagnosis	No. of cases (%)
1.	Adenocarcinoma	86 (77.5.%)
2.	Mucinous adenocarcinoma	11(9.9%)
3.	Signet ring cell carcinoma	8 (7.2%)
4.	Non-Hodgkin Lymphoma	5 (4.5%)
5.	Carcinoid tumor	1 (0.9%)
	Total	111

We observed that malignant lesions were more frequent in males 67(60.36%) than females 44(39.64%) with a male to female ratio of 1.6:1.

In the present study we observed that risk age groups for malignant lesions ranged from adolescents in the 2nd decade to older adults in the 8th decade but age group of 61-70- years were at highest risk.**(Table 7)**

Table 7: Age distribution of malignant neoplastic lesions

Age Group	Carcinoid tumor	NHL	Signet ring cell ca	Mucinous adenoca	Adenocarcinoma		
					Well diff	Mod diff	Poorly diff
0 – 10	-	-	-	-	-	-	-
11 – 20	-	-	-	-	-	-	1
21 – 30	-	-	1	1	1	2	2
31 – 40	-	1	3	1	4	8	2
41 - 50	-	-	-	2	7	10	1
51 - 60	-	1	1	2	10	10	1
61 - 70	1	3	1	3	12	10	2
71 - 80	-	-	2	2	1	1	1
81 - 90	-	-	-	-	-	-	-
Total	1	5	8	11	35	41	10

Table 8: Site distribution of malignant neoplastic lesions

S.no	Site	No. of malignancies
1.	Caecum	6 (5.40%)
2.	Ascending colon	13 (11.71%)
3.	Transverse colon	4 (3.60%)
4.	Descending colon	18 (16.21%)
5.	Sigmoid colon	32 (28.83%)
6.	Rectum	38 (34.24%)
	Total	111

From the above table we conclude that rectum was the most common site for malignancies followed by sigmoid colon. We observed that malignancies commonly affected left side colon.
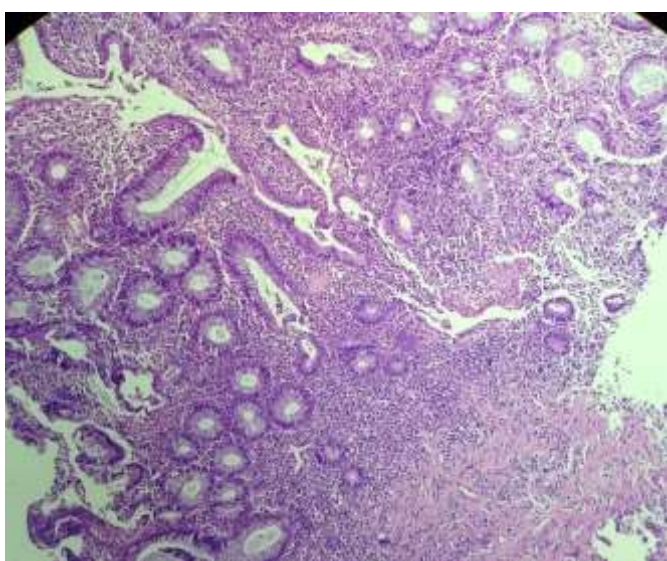
Figure 1. Microscopy showing IBD (10X)
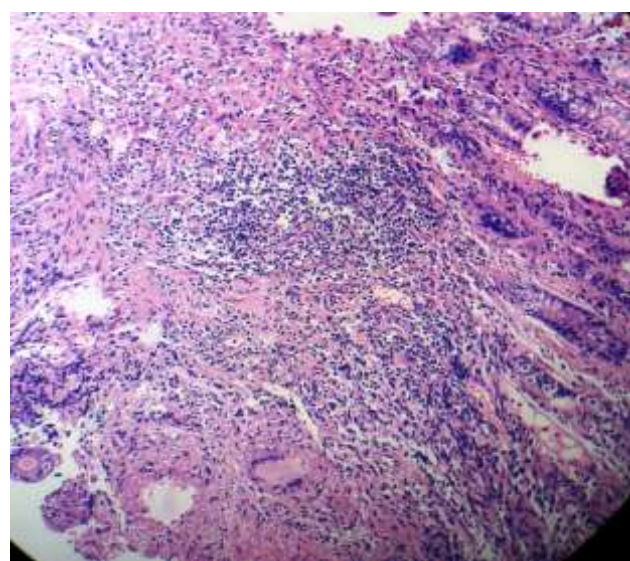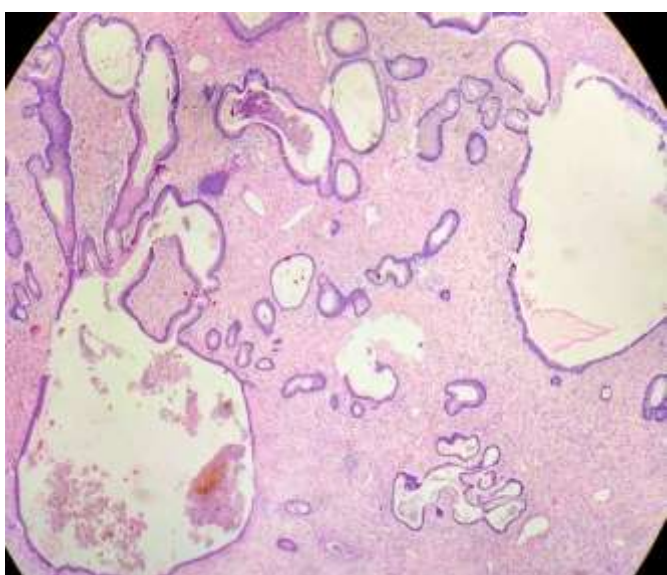

Figure 2. Microscopy showing TB (10X)

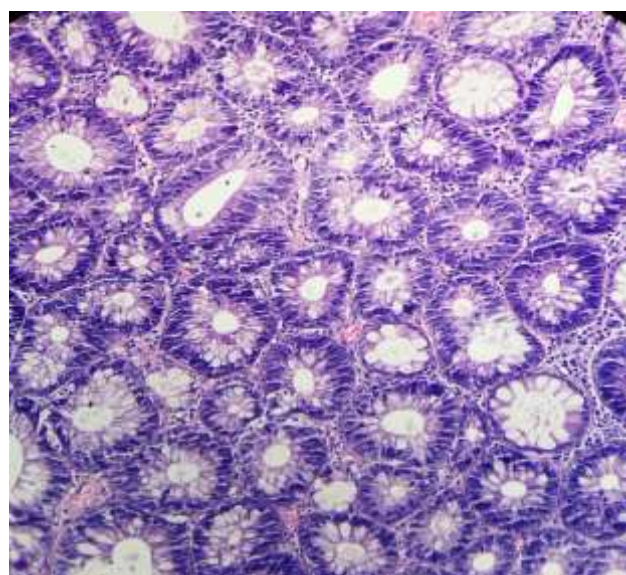Figure 3. Microscopy showing Juvenile polyp (20X)

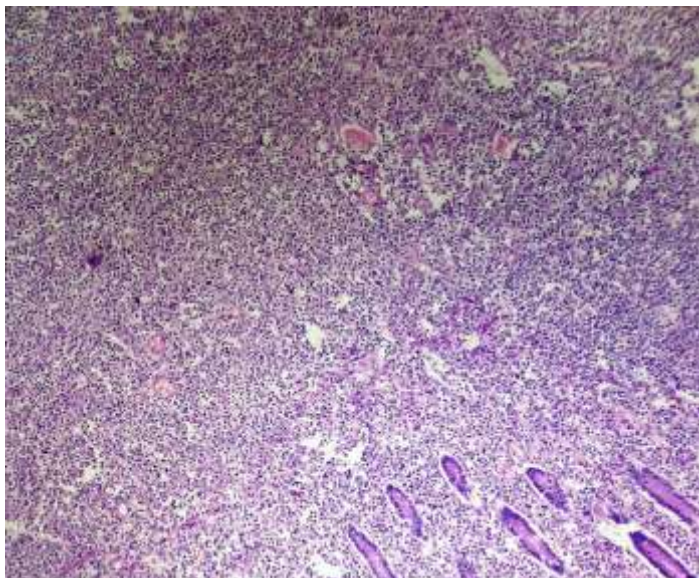Figure 4.Tubular adenoma with low grade dysplasia(20X)

Figure 5. Microscopy showing NHL (10X)

DISCUSSION

Histopathological examination of colorectal biopsies reveal a spectrum of lesions ranging from non- neoplastic ones to neoplastic tumours including benign and malignant ones. All these lesions often require colonoscopic biopsies for their conclusive diagnosis (13).

In the present study, 284 colonoscopic biopsies were received in our department, in the period between October 2015 to October 2016. In the present study, age range was observed to be wide, from 1 year to 85 years of age. Out of 171 neoplastic lesions, 60 were benign and 111 were malignant forming a ratio of benign to malignant lesions as 0.54:1.

Out of a total of 284 colorectal lesions 180 (63.38%) were present in males and 104 (36.62%) were present in females with male to female ratio being 1.73:1. Out of 284 biopsies, 60.21% were neoplastic and 39.79% biopsies were non-neoplastic. These finding are similar to another study where neoplastic lesions were seen more than non-neoplastic lesions (56.2% vs. 43.1%) (14). In other similar studies non-neoplastic lesions were detected more than the neoplastic lesions (66.3% vs. 28.9%, 61.3% vs. 38.7% (4,15).

Out of 113 biopsies diagnosed as non-neoplastic lesions, 18.58% biopsies comprised of chronic colitis, 16.81% biopsies were acute colitis, 16.81% were IBD and others made up 47.8%. Similar findings were seen in other previous study series where colitis was seen in 47.3% and 38.3% biopsies (4,16).

Tuberculosis was seen in 6.1% of non-neoplastic diseases, characterized by confluent caseating epitheloid granulomas and Langhan's giant cells. ZN stained sections demonstrated presence of acid fast bacilli.

Rangaswamy R et al observed that Tuberculosis comprised 7.32% of the non-neoplastic diseases in their study (17). Thus our observations are comparable with this study.

We observed an incidence of 16.81% of IBD among non-neoplastic lesions in our study; 15 (13.27%) being Ulcerative colitis (UC) and 4(3.5%) being Crohn's disease (CD). Colorectal cancer (CRC) is among the most feared long-term complications of ulcerative colitis (UC).

Although association between UC & CRC is well established, documentation of an association between CRC and Crohn's has only recently been appreciated (18).

The presence of dysplasia in a colonic biopsy, a precursor to cancer, is a significant predictor not only of co- existant cancer but also of subsequent risk of developing colorectal cancer. With this attendant risk, it is generally accepted that when high grade dysplasia (HGD) is found on biopsy, colectomy should be performed (19).

Wool rich and colleagues (20), showed that LGD, like HGD, is predictive of future carcinoma: of the patients studied, 18% of those with LGD progressed to carcinoma within an average of 6.3 years. Therefore, it is important to document presence of dysplasia in UC & CD, which will determine the course of treatment in these patients.

Rangaswamy R et al observed that IBD comprised 24.4% of non- neoplastic lesions in their study (17).

Shefali. H. Karve et al. in their study observed 11 cases of Ulcerative colitis and 2 cases of Crohn's disesase (21).They also identified dysplasia in 2 cases of UC, one showing LGD and the other HGD.

In the present study, 7 cases of UC were showing dysplasia, 4 LGD and the other 3 HGD. These patients require follow up and different modality of treatment. Thus our observations were comparable to these studies.

We observed 2(1.7%) cases of Hirschprung's disease in our study. Both of these patients presented in first decade of life and male to female ratio was 1:1.

Pandey MS et al observed Hirschprung's disease in 6 (7.59%) patients. All cases of Hirschprung's disease were in 0-10 year

age group in their study (22).

Colonic polyps are broadly categorized in non-neoplastic and neoplastic polyps. In our study out of 93 polyps, 33 were non neoplastic and 60 were neoplastic polyps.among non-neoplastic polyps 15 were juvenile polyps and 14 were hyperplastic polyps. **(Table 9)**

Table 9: Comparison of Non neoplastic polyps with other study

Study	Juvenile polyp	Hyperplastic polyp	Retention polyp	Total
Hassan et al[23]	21 (67.7%)	6(19.3%)	4(13%)	31
Present study	15(45.5%)	14(42.42%)	4(12.12%)	33

The present study was compared with the study series of Hassan Abdulla Al-aquli et al (23). As observed, juvenile polyps and hyperplastic polyps were the most common non neoplastic polyps occurring in both studies.

The majority of neoplastic polyps detected in our study population were tubular adenomas (46.67%) followed by tubulovillous adenomas (38.33%). We also identified mild dysplasia in 3 tubular and 2 villous adenomas in our study.

Adenomas were most commonly seen in age group of 61-70 years followed by a 2nd highest peak in 5th decade. Most common site for adenomatous polyps was sigmoid colon followed by rectum.

Konishi F et al., in their study of colorectal adenomas found that 81 % were tubular adenomas while only 3% were villous of the villous type (24). An 88% of tubular adenomas showed mild dysplasia while only 4% showed severe dysplasia in their study.

Tony J and Harish K et al., found that in Southern India adenomatous polyps were the most common polyps (79.8%)

in the age group of 23-82 years with M: F ratio of 2.5:1 (25). They also found severe dysplasia in 12% of tubular adenomas and 43% of villous adenomas.

In our study malignancies were seen in 39.08% biopsies. 94.6% were adenocarcinomas, 4.5% were Non-Hodgkin's lymphoma and 0.9% were Carcinoid tumor. Out of these adenocarcinomas, 33.33% were well differentiated, 39.04% were moderately differentiated, 9.52% were poorly differentiated and 10.47% was mucin secreting type and 7.61% were signet ring cell carcinoma. Mucinous carcinomas were PAS positive indicating presence of intracellular and extracellular mucin.

In the present study of 111 malignant lesions, clustering of cases was observed between 18-70 years of age. Maximum number of cases were observed in (61-70) year age group. Majority of the malignant cases were males 67(60.36%) and the rest were females 44(39.64%). The most common site of occurrence of the malignant tumors was rectum. All these findings are in accordance with the study series of Sudarshan et al (26) and Laishram RS et al (27)

Table 10; Showing comparison of Histological grade of malignant lesions with other similar studies

Study	No. of cases	WD adenoca	MD adenoca	PD adenoca	Mucinous adenoca	Signet ring cell ca	NHL	Carcinoid tumour
Laishram RS et al[26]	54	17 (31.48%)	20 (37.04%)	17 (31.48%)	_	_	_	_
Shyamal Kumar et al[28]	180	51 (28.3%)	49 (27.2%)	20 (11.1%)	32 (17.8%)	28 (15.6%)	_	_
Shefali .H. Karve et al[21]	68	24 (35.3%)	25 (36.8%)	9 (13.2%)	8 (11.8%)	2 (2.9%)	_	_
Present study	111	35 (33.33%)	41 (39.04%)	10 (9.52%)	11(9.9%)	8 (7.2%)	5 (4.5%)	1 (0.9%)

The present study is in accordance with the above mentioned study series, wherein the most common histological grades were well differentiated and moderately differentiated.**(Table 10)**

CONCLUSION

The histomorphological profile of colorectal biopsies have a wide spectrum, ranging from infectious conditions, inflammatory disorders, precancerous lesions to colorectal malignancies. This study emphasises the need for early diagnosis of these diseases through histopathology, which when correlated clinically will help the surgeon/clinician to implement the appropriate treatment and improve the survival of the patients.

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