



## ILEOSCOPY; DIAGNOSTIC YIELD IN A TERTIARY CARE HOSPITAL OF PAKISTAN

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**ABSTRACT...** Colonoscopy is one of the most important modalities to investigate complaints related to lower gastrointestinal tract. Terminal ileum is an essential part of the complete colonoscopic examination. **Objectives:** To observe the diagnostic yield of ileoscopy in patients undergoing colonoscopy. **Design:** Retrospective and observational study. **Period:** January 2010 to May 2014. **Setting:** Liaquat National Hospital and Medical College. **Patients and methods:** Patients undergoing colonoscopy fulfilling inclusion and exclusion criteria were enrolled. Terminal ileum was examined and biopsies taken if abnormality present. Statistical analysis was done by SPSS- 18. **Result:** A total of 1296 patients were included, 884 (68.2%) were male and 412 (31.8%) were female. Age ranged from 15-90 years. The commonest indication was bleeding per rectum (35.6%). 1133(87.4%) patients had normal mucosa and 163 (12.6%) had abnormal mucosa on ileoscopy. Of these 163 patients, 68 had ulcers, 56 had inflammation, 29 had nodular mucosa and 10 had polyp. Histopathological examination showed non-specific inflammation in 139 patients; granulomatous inflammation in 7; reactive lymphoid hyperplasia in 8; 3 had normal result; biopsies were not taken in remaining 6 patients. By using chi-square test we found a significant statistical relationship between macroscopic abnormality of terminal ileum mucosa and age of patients, weight loss, chronic diarrhoea, and abdominal pain. On logistic regression, age group, chronic diarrhoea and weight loss retained strong relationship with macroscopic abnormality of terminal ileum mucosa. **Conclusions:** Though a large number of patients (12.6%) had abnormal terminal ileum mucosa, histopathological analysis did not show any significant yield of ileoscopy. Terminal ileal abnormality was more common in young and middle aged patients and in patients presenting primarily with chronic diarrhoea and weight loss.

**Key words:** Lower gastrointestinal tract, colonoscopy, ileoscopy, terminal ileum disease.

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## INTRODUCTION

Colonoscopy is one of the most important modalities to investigate complaints related to lower gastrointestinal tract. It is not only important for diagnostic purposes but also has an important role in the therapeutic management of diseases like polyps and bleeding ulcers of the lower gastrointestinal tract. Examination of the terminal ileum is an essential part of the complete colonoscopic examination as it can be helpful to confirm or rule out the diagnosis of diseases which affect this part of the intestine more commonly, such as tuberculosis, lymphoma and Crohn's disease. Nagasaka et al in 1972<sup>1</sup> reported the first successful terminal ileum intubation. Routine ileoscopy is very useful and easy to perform by properly trained endoscopists. However, it requires

skill and a lot of patience to perform. Although ileoscopy has been recommended by several authors<sup>2,3,4,5,6</sup>, it is not routinely performed when colonoscopy is done<sup>7</sup>. Tuberculosis (T.B.) is very common in developing countries and intestinal T.B. most commonly affects terminal ileum. Ileoscopy would be a very useful modality for the diagnosis of intestinal T.B. There is a lack of information from developing countries regarding diagnostic yield of colonoscopy especially from our country.

The aim of this study was to find the diagnostic yield of ileoscopy in patients undergoing colonoscopy.

## OBJECTIVE

To find the diagnostic yield of ileoscopy in patients undergoing colonoscopy in a tertiary care hospital.

## MATERIAL AND METHODS

Patients undergoing colonoscopy in the service of a single consultant were included in this study on the basis of inclusion and exclusion criteria. This was a retrospective study carried out at the Department of Gastroenterology (fellowship program), Liaquat National Hospital and Medical College (a tertiary care hospital) over a period of four and a half years. Included patients in this study belonged to both sexes and age ranged from 15 to 90 years. All patients had complaints or indications which required colonoscopic examination. Patients who had colonic growth and stricture causing luminal occlusion and those who had very poor bowel preparation obscuring the view completely were excluded from the study, also those patients in whom ileoscopy could not be done for any reason were excluded. This study was approved by the Ethical Review Committee of our hospital.

Preparation and procedure of colonoscopy & its benefits and risks were explained to the patients and their attendants; written consent was taken for every procedure.

We intended to intubate terminal ileum in every patient. After identifying the caecum by observing the appendicular orifice and ileo-caecal valve, efforts were made to intubate the terminal ileum. Appearance of mucosa and lumen of terminal ileum was noted and biopsies were taken if there was any abnormality present.

Statistical analysis was done by SPSS- 18. Frequencies of age group, gender, indications of colonoscopies, and diseases of terminal ileum were noted. Stratification between age group, gender, major indications of colonoscopy and diseases of terminal ileum was calculated by chi-square test and found significant if p value <0.05. Logistic regression was applied to further stratify the variables having significant p values.

## OPERATIONAL DEFINITION

**Macroscopic (endoscopic) normal mucosa of terminal ileum:** when normal architecture of mucosa is preserved.

**Macroscopic (endoscopic) abnormal mucosa of terminal ileum:** when normal architecture of mucosa is distorted by diseases such as ulcer and inflammation.

**Histopathologically significant disease of terminal ileum:** when histopathological examination shows diseases such as T.B. or crohn's disease which requires specific management.

## RESULT

A total of 1468 patients were examined during the study period. Out of these patients 1296 were included in this study and 172 patients were excluded. Among these 1296 patients, 884 (68.2%) were male and 412 (31.8%) were female (Table I). Age of the patients ranged from 15 to 90 year with a median of 48 year. We divided the patients in three age groups (Table I); 506 (39%) patients belonged to group 1 (age range 15 to 40 years), 605 (47.6%) patients belonged to group 2 (age range 41 to 65 years), and 185 (14.3%) patients were in group 3 (> 65 years). The indications of the colonoscopic examination are shown in Table I.

GENDER	Frequency	Percent
MALE	884	68.2
FEMALE	412	31.8
AGE GROUP		
GROUP 1 (12 TO 40 YEAR)	506	39
GROUP 2 (41 TO 65 YEAR)	605	46.7
GROUP 3 (> 65 YEARS)	185	14.3
INDICATIONS		
BLEEDING P/R	462	35.6
ABDOMINAL PAIN	344	26.5
WEIGHT LOSS	277	21.4
CHRONIC DIARRHOEA	236	18.2
CONSTIPATION	198	15.3
ANEMIA	147	11.3
MELENA	118	9.1
ALTERED BOWEL HABBIT	43	3.3
SURVEILLANCE	42	3.2
STOOL FOR OB +VE	25	1.9

SCREENING	22	1.7
FAMILY H/O Ca COLON	8	0.6
POLYP	7	0.5

**Table-I. Demographic data & indications of colonoscopy of 1296 patients**

The most common indication was bleeding per rectum (35.6%), followed by abdominal pain (26.7%) and weight loss (22.3%). Bowel preparation was good and suboptimal in 82.3% and poor in 17.7%. Ileoscopy showed normal mucosa of terminal ileum in 1133 (87.4%) patients and abnormal mucosa was found in 163 (12.6%) patients. The most common abnormality was terminal ileum ulcer in 68 (5.2%) patients followed by inflammation in 56 (4.3%), nodular mucosa in 29 (2.2%) and polyp in 10 (.8%) patients (Table II).

Endoscopic findings	Frequency	Percent
ULCER	68	5.20
INFLAMMATION	56	4.30
NODULAR	29	2.20
POLYPS	10	0.80
NORMAL	1133	87.40
Total	1296	100

**Table-II. Macroscopic (Endoscopic) findings of terminal ileum**

Histopathological examination of macroscopically abnormal terminal ileal mucosa (Table III) showed non-specific inflammation in 139 patients; Granulomatous inflammation was found in 7 patients; 8 patients had reactive lymphoid hyperplasia; 3 patients had normal biopsy report; biopsies were not taken in remaining 6 patients who had bleeding ulcers in the terminal ileum most probably due to enteric fever. No complication occurred in our study.

Conclusion	Frequency	Percent
Non Specific Inflammation	139	88.53
Granulomatous Inflammation	7	4.46
Lymphoid Hyper Plasia	8	5.10
Normal	3	1.91

**Table-III. Histopathological results of macroscopically abnormal mucosa of terminal ileum (No. of patients – 157)**

By using chi-square test we found a significant statistical relationship between Macroscopic abnormality of terminal ileum mucosa and age of patients ( $p$  value  $<.001$ ); Macroscopic abnormality of terminal ileum mucosa and weight loss ( $p$  value  $<.001$ ); Macroscopic abnormality of terminal ileum mucosa and chronic diarrhoea ( $p$  value  $<.001$ ); Macroscopic abnormality of terminal ileum mucosa and abdominal pain ( $p$  value  $=.009$ ). On logistic regression, age group ( $p$  value  $<.001$ ), chronic diarrhoea ( $p$  value  $=.052$ ) and weight loss ( $p$  value  $=.004$ ) retained strong relationship with macroscopic abnormality of terminal ileum mucosa.

We did not find any significant relationship between histopathology and other variables as only seven patients had granulomatous inflammation leading to the diagnosis of T.B. which requires specific treatment; 139 patients had non-specific inflammation; 8 patients had lymphoid hyperplasia which did not lead to any specific diagnosis and 3 patients had normal findings.

## DISCUSSION

Although debate continues about routine retrograde ileoscopy, many studies have found it to be of considerable diagnostic value.<sup>1,2,3,4,5,6</sup> Retrograde ileoscopy is a relatively easy, tolerable, and quick procedure which is quite feasible in most cases. A high intubation rate of the terminal ileum is supported by recent data, ranging from 62%-95.5%, adding only some extra minutes to the entire duration of colonoscopy without increasing the risk of complications.<sup>7,8</sup> In our study terminal ileum intubation was successfully achieved in 1296 patients out of 1468 (88.28%; unadjusted rate of ileoscopy).

In this study, ileoscopy showed normal mucosa of terminal ileum in 1133 (87.4%) patients and abnormal mucosa was found in 163 (12.6%) patients. The most common abnormality was terminal ileum ulcer in 68 (5.2%) patients followed by inflammation in 56 (4.3%), nodular mucosa in 29 (2.2%) and polyp in 10 (.8%) patients (Table II). Histopathological examination of

macroscopically abnormal terminal ileal mucosa (Table III) showed non-specific inflammation in 139 patients; Granulomatous inflammation was found in 7 patients; 8 patients had reactive lymphoid hyperplasia; 3 patients had normal biopsy report; biopsies were not taken in remaining 6 patients who had bleeding ulcers in the terminal ileum most probably due to enteric fever and these ulcers were injected with diluted adrenaline and treated for enteric fever with good response. No complication occurred in our study.

In a study by Borsch et al<sup>9</sup>, the rate of ileoscopy (adjusted examination) was 92%, and the disease of the terminal ileum was found in 5% of patients but the negative results were important in other 24.5% of patients so they reported the diagnostic yield of ileoscopy in 29.5% of patients. Kundrotas et al<sup>4</sup> reported ileal intubation in 79% of patients and they found abnormal mucosa of terminal ileum in only 4 patients out of which only 1 patient had histological abnormality. Ansari et al<sup>14</sup> reported 97% terminal ileum intubation rate and found abnormal mucosa of terminal ileum in 20.5 % of patients. In a study by Cherian et al<sup>7</sup>, the rate of ileoscopy was 71.5% and the diagnostic yield of ileoscopy and histology was reported in 16.7% and 19 % in patients with colonic inflammatory bowel disease and 2.69% and 7.4% in other patients. The rate of ileoscopy was reported 86.4% in a study of Bhasin et al<sup>9</sup>, and they established diagnosis in 14.4% (8/57) of cases after ileoscopy; 2 patients had tuberculosis, 1 each had typhoid & NSAID-associated bleeding ulcer, 1 had lymphoma & 3 were cases of reactive arthritis with terminal ileum ulcers. Jeong et al reported 87.1 % terminal ileal intubation rate and found macroscopically abnormal mucosa of terminal ileum in 3.7% of patients.<sup>17</sup> Geboes K et al<sup>8</sup> found endoscopic lesions of terminal ileum in 44/123 patients. In a study of 39 patients with hematochezia, Misra et al<sup>10</sup> observed abnormal ileal mucosa in 12.8%. Findings included 1 patient with nodularity & mucosal ulceration; 1 Dieulafoy lesion; 1 angiomatous malformation & 2 ileal ulcers.

On histopathology, Misra found non-caseating

granulomas, collections of loosely arranged epithelioid cells & non-specific inflammation on ileal biopsy in 11 patients with suspected colonic tuberculosis<sup>6</sup>. In a study of 39 patients with hematochezia, Misra reported tuberculosis, enteric & nonspecific ulceration in 1 patient each<sup>10</sup>. In their study of 257 patients with diarrhea Geboes et al noted that microscopic lesions of the terminal ileum were present in 49% of patients<sup>8</sup>.

Contrary to above mentioned studies, Yoong<sup>18</sup> et al analyzed data retrospectively on 2149 patients; ileoscopy was carried out in only 16% of cases. The diagnostic yield was reported only 4.6% & change to clinical management occurred in half of these patients. It is conceivable that had ileoscopy been performed in a greater number of patients, the percentage of diagnostic yield & change to management might have been substantially greater.

Normal ileal finding was also helpful in ruling out T. Ileum pathology in patients with abdominal pain, weight loss or, lower GI bleeding and chronic diarrhoea. This means that ileoscopy is necessary to conclude whether or not such a symptom is related to an organic lower gastrointestinal disorder. In other words, negative findings are as important as positive findings to make an objective decision for the next step of management in a patient with the above mentioned symptoms. In a study<sup>18</sup> the authors suggested that although positive findings in unselected patients might be low, normal findings were very helpful in clinical decision making as well and therefore they reported a very high diagnostic yield of ileoscopy. Similarly Borsch et al<sup>9</sup> also considered significance of normal examination of terminal ileum in his study and concluded a high diagnostic yield. Our study also supports the idea that negative examination of ileoscopy can be helpful for the management of patients. However, this assumption needs to be validated by conducting larger studies, powered to confirm this specific relation.

Documentation of colonoscopy completion is an important concern. Some studies showed that

failure to detect cancer in screening colonoscopy may be due to incomplete procedure<sup>12</sup>. It has been suggested that ileoscopy is very helpful to prove completion of colonoscopy<sup>7</sup>.

By using chi-square test we found a significant statistical relationship between Macroscopic abnormality of terminal ileum mucosa and age of patients (p value <.001); weight loss (p value <.001); chronic diarrhoea (p value <.001); and abdominal pain (p value =.009). On logistic regression, age group (p value <.001), chronic diarrhoea (p value = .052) and weight loss ((p value = .004) had strong relationship with macroscopic abnormality of terminal ileum mucosa.

We did not find any significant relationship between gender and terminal ileum disease, nor between bleeding per rectum and terminal ileum disease as has been reported in some studies<sup>3</sup>.

Another important aspect of our study is that despite the widespread incidence of intestinal tuberculosis in our part of the world, only 7/157 patients with macroscopically abnormal mucosa had granulomatous inflammation consistent with tuberculosis in our study. Similarly low incidences have been reported by studies in neighboring countries, tuberculosis being confirmed in 4/43 patients in one study<sup>6</sup>, 9/53 in another<sup>13</sup> & in 2/57 patients in a third<sup>16</sup>. It has been postulated that as tuberculous lesions are submucosal, they are not sampled by biopsy<sup>13</sup>. Another possible reason of low frequency of tuberculosis in the current study is that most of the patients included in this study belonged to middle class as our hospital is a private tertiary care hospital and tuberculosis is more prevalent in low socioeconomic class. Also, availability of colonoscopy has been speculated to result in early assessment before disease becomes widespread in classical anatomical locations. Suggestions have been made that blind biopsies from macroscopically normal mucosa may increase diagnostic yield in patients with chronic non bloody diarrhea<sup>20</sup>. To summarize, our results indicate that ileoscopy is a safe and easy procedure and it has a very important

role in the management of patients with lower gastrointestinal complaints in terms of positive as well as negative results of examination. We also noted that abnormal terminal ileum mucosa was more common in young and middle aged patients and it was also more common in patients with a primary complaint of weight loss and chronic diarrhoea.

## CONCLUSIONS

Though a large number of patients (12.6%) had abnormal terminal ileum mucosa on ileoscopy, histopathological analysis did not show any significant yield of ileoscopy. Terminal ileal abnormality was more common in young and middle aged patients and in patients presenting primarily with chronic diarrhoea and weight loss.

We recommend that ileoscopy should be done in every patient undergoing colonoscopy since it is an easy, safe and useful procedure for the management of patients with the complaints related to lower gastrointestinal tract.


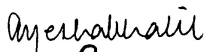


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