

# ROLE OF COLONOSCOPY IN DIAGNOSING ORGANIC DISEASES IN PATIENTS WITH COLONIC SYMPTOMS COMPATIBLE WITH ROME IV CRITERIA

By

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## ABSTRACT

**Background:** Irritable bowel syndrome is a symptom-based condition defined by the presence of abdominal pain or discomfort, with altered bowel habits, the diagnosis could be reached using symptom-based diagnostic criteria without the need for exhaustive investigation; however interest in the potential for a missed organic GI disease in patients diagnosed IBS has increased over the last years.

**Objective:** This study aimed to evaluate the role of colonoscopy in diagnosing organic diseases in patients with colonic symptoms compatible with Rome IV criteria of Irritable bowel syndrome as well as studying the effect of the presence or absence of alarm features on detecting organic lesions

**Patients and methods:** A cross sectional study was carried out on 50 patients fulfilling the Rome IV criteria for IBS. The study was conducted in the department of Hepatogastroenterology, Al-Azhar university Hospitals from December 2018 to May 2019.

Patients were selected and divided into two equal groups: Group A: fulfilled Rome IV criteria for IBS without alarm features, and Group B: included 25 patients fulfilled Rome IV criteria for IBS with alarm features. All patients underwent full colonoscopy along with biopsy from colon was taken for histopathological examination.

**Results:** The mean age of participants was 40.12 years. Males were 27 (54%) while females were 23 (46%), Eleven of 50 patients (22%) fulfilling Rome IV criteria of IBS had organic colonic diseases. There was higher prevalence of organic GI lesions in patients who reported alarm features. Microscopic colitis was the predominant organic disease among studied patients. IBS-D has the highest contribution to the total number of organic diseases.

**Conclusion:** Up to one in six patients meeting criteria for IBS without alarm features in routine clinical practice may have underlying organic GI lesions, and this increased to one in four patients if alarm features were present.

**Keywords:** colonoscopy, organic diseases, colonic symptoms, Rome IV criteria.

## INTRODUCTION

Functional bowel disorders (FBD) are highly prevalent disorders found worldwide. These disorders have the potential to affect all members of society, regardless of age, sex, race, creed, color, or socioeconomic status (*Lacy et al., 2016*).

Irritable bowel syndrome is the most commonly diagnosed gastrointestinal condition. It is a symptom-based condition defined by the presence of abdominal pain or discomfort, with altered bowel habits, in the absence of any other disease to cause these sorts of symptoms (*Chey et al., 2015*).

Rome IV Diagnostic Criteria for IBS (*Lacy et al., 2016*).

Recurrent abdominal pain, on average, at least 1 day per week in the last 3 months, associated with 2 or more of the following criteria:

1. Related to defecation.
2. Associated with a change in frequency of stool.
3. Associated with a change in form (appearance) of stool.

Criteria fulfilled for the last 3 months with symptom onset at least 6 months before diagnosis.

Management guidelines for IBS recommend that, in a patient who reports abdominal pain associated with a change in stool consistency or number of motions, the diagnosis could be reached using symptom-based diagnostic criteria without the need for exhaustive investigation (*Schmulson and Drossman, 2017*). However, interest in the potential for a missed organic GI lesions in patients

diagnosed IBS has increased over the last years (*Patel et al., 2015*).

There is symptomatic overlap between IBS patients and other gastrointestinal diseases. Inflammatory bowel diseases, including ulcerative colitis and Crohn's disease, are of concern when a patient with IBS symptoms is evaluated. Studies suggest that more than a third of patients with inflammatory bowel disease fulfill the Rome criteria for IBS (*Colombel et al., 2019*).

For IBS-C patients, colorectal cancer is a common concern; Case control study found that patients with chronic constipation have a significantly higher prevalence and incidence of colorectal cancer and benign colorectal neoplasm (*Paquette et al., 2016*). Collagenous and lymphocytic colitis are more difficult to distinguish from IBS because patients present with chronic watery diarrhea and often no weight loss. In addition, these forms of colitis have completely normal endoscopic appearance (*MacCaigne et al., 2014*).

This study aimed to evaluate the role of colonoscopy in diagnosing organic diseases in patients with colonic symptoms compatible with Rome IV criteria of Irritable bowel syndrome, as well as studying the effect of the presence or absence of alarm features on detecting organic diseases.

## PATIENTS AND METHODS

Patients were selected from those attending outpatient Gastroenterology clinics at AL-Azhar University Hospitals, and fulfilling Rome IV criteria of IBS from December 2018 to April 2019. Study information sheet was provided to patients

at their initial clinic visit. Informed consents were written by patients who agreed to participate in this study.

Across-sectional survey was conducted in the Department of Hepatogastroenterology, AL-Azhar University Hospitals. Fifty Patients attended the Gastroenterology outpatient clinic fulfilled Rome IV criteria for diagnosis of IBS were enrolled in the study. Patients were divided into two equal groups: **Group A:** fulfilled Rome IV criteria for IBS without alarm features, and **Group B:** fulfilled Rome IV criteria for IBS with alarm features.

Basic demographic data were collected including name, age, gender, residence, occupation, tobacco use, and duration of symptoms. Symptoms. Data were collected using the Rome IV diagnostic questionnaire for the adult functional GI disorders. Presence or absence of alarm features including weight loss, blood in the stools, anemia, or a family history of colorectal cancer or IBD were recorded.

We included patients who met the Rome IV criteria for IBS diagnosis. Patients were subdivided by predominant stool pattern reported by the patient into diarrhea-predominant IBS (IBS-D), constipation-predominant IBS (IBS-C), mixed stool pattern IBS (IBS-M), or un-subtyped IBS (IBS-U) (*Lacy et al., 2016*).

We excluded patients who previously diagnosed IBD, patients who previously diagnosed CRC, patients with a recent history of non-steroidal anti-inflammatory drugs, patients with uncontrolled thyroid disorders, or patients with advanced comorbid conditions.

All patients underwent full colonoscopy. Bowel preparation was done, using oral magnesium citrate for 2 days prior to the procedure, or polyethylene glycol for 1 day prior to the procedure (depending on patient and physician preference). Patient fasted for 16-24 hours (water and fiber free juices were allowed), patients underwent 3 enemas using hypertonic solution of sodium phosphates the day before the procedure. Pentax colonoscopes (Pentax Canada, Inc.) were used for colonoscopy. The following findings were defined as being consistent with organic disease at colonoscopy: evidence of colitis (inflammation or ulceration), colorectal carcinoma, masses or strictures.

Multiple biopsies were taken from different segments of the colon according to defined lesions, prepared for microscopic examination as formalin fixed paraffin embedded tissue. Sections were cut at 4 μm and stained with hematoxylin and eosin dye, then interpreted by an experienced histopathologist. Organic diseases at histopathological examination of biopsy specimens were defined as microscopic colitis, ulcerative colitis, Crohn's disease, colonic or rectal carcinoma.

Individuals with no evidence of organic disease at both colonoscopy and histopathological examination of biopsy specimens were classified as exhibiting no organic GI disease, while those with evidence of organic disease at either colonoscopy or histopathological examination of biopsy specimens were classified as exhibiting organic GI disease.

**The study was done according to the ethical board of Al-Azhar University.**

**Statistical analysis:** Data were analyzed using Statistical Program for Social Science (SPSS) version 15.0. Quantitative data were expressed as mean  $\pm$  standard deviation (SD). Qualitative data were expressed as frequency and percentage.

**The following tests were done:**

Independent-samples t-test of significance was used when comparing between two means.

Chi-square test was used when comparing between non-parametric data.

Mann-Whitney U test was used to investigate whether two independent samples were selected from populations having the same distribution.

Probability (P-value) P-value  $<0.05$  was considered significant.

## RESULTS

In this study, the age range of participants was 28 to 53 years with a mean of  $40.12 \pm 7.5$  years. Males were 27 (54%), and females were 23 (46%). Rural patients represented 50% (25 patients) and urban patients were 50% (25 patients). Smokers were 14 patients (28%). Presence of organic colonic disease was higher among urban than rural, and males than

females. Mean of age was higher in patients with organic colonic diseases ( $41.55 \pm 6.19$ ) versus ( $39.72 \pm 7.81$ ) of patients with nonorganic diseases and higher percentage of nonsmokers than smokers. However, there was no statistically significant relation between any of these features and organic colonic diseases (Table1).

**Table (1): Relation between organic colonic diseases VS demographic data and smoking**

Variables	Groups	No organic D (N = 39)		Organic D (N = 11)		P-value
Age (years)	<b>Mean <math>\pm</math>SD</b>	39.72 $\pm$ 7.81		41.55 $\pm$ 6.19		0.425
	<b>Range</b>	28 - 53		29 - 52		
Sex (n, %)	<b>Male</b>	21	53.8%	6	54.5%	0.967
	<b>Female</b>	18	46.2%	5	45.5%	
Residence (n, %)	<b>Rural</b>	20	51.3%	5	45.5%	0.733
	<b>Urban</b>	19	48.7%	6	54.5%	
Smoking (n, %)	<b>No</b>	28	71.8%	8	72.7%	0.951
	<b>Yes</b>	11	28.2%	3	27.3%	

The duration of symptoms varies among patients ranging from 1 to 12 years. Duration of complaint in patients diagnosed to have no organic

colonic disease has a higher mean of  $4.44 \pm 2.29$  years versus  $2.27 \pm 1.1$  years in patients with organic disease (Table 2).

**Table (2): Relation between organic colonic disease and duration of symptoms.**

Variables		Groups	No organic D (N = 39)	Organic D (N = 11)	P-value
Duration (years)	<b>Mean ±SD</b>		4.44 ± 2.29	2.27 ± 1.1	<b>MW = 79.5</b> <b>0.001**</b>
	<b>Range</b>		1 - 12	1 - 5	

Eleven of 50 patients 22% fulfilled Rome IV criteria of IBS had organic colonic diseases. There was a higher prevalence of organic GI diseases

among those who reported alarm features 28% compared to those without alarm features 16% (Table 3).

**Table (3): Number and percentage of organic diseases in studied patients**

Variables		Groups	Group A (no alarm feature) (N = 25)		Group B (with alarm feature) (N = 25)		P-value
Organic diseases (n, %)	<b>No</b>		21	84%	18	72%	0.306 NS
	<b>Yes</b>		4	16%	7	28%	

Twenty one patients presented with IBS-D (42%), 13 patients with IBS-C (26%), 14 patients with IBS-M (28%) and 2 patients with IBS-U (4%). Among patients with IBS-D, organic lesions were present in 6 (24%);

among patients with IBS-C, in 2 (15.3%); among patients with IBS-M, in 3 (21.4%). No organic lesions were present among patients with IBS-U (Table 4).

**Table (4): IBS sub-types in studied groups**

Variables		Groups	Group A (no alarm feature) (N = 25)		Group B (with alarm feature) (N = 25)		Total (n = 50)	
IBS sub-types	<b>Constipating</b>		8	32%	5	20%	13	26%
	<b>Diarrheal</b>		9	36%	12	48%	21	42%
	<b>Mixed</b>		7	28%	7	28%	14	28%
	<b>Unsub-typed</b>		1	4%	1	4%	2	4%

IBS-D has the highest contribution to the total number of organic diseases 54.5% followed by IBS-M 27.3%, IBS-C 18.2%. Microscopic colitis was the predominant organic disease among studied patients; 4/11 patients

(36.4%). Three patients had colorectal cancer (27.3%), two patients had ulcerative colitis (18% of organic lesions detected), patient with solitary rectal ulcer (9.1%) and patient had Crohn's disease (9.1%) (Table 5).

**Table (5) : description of organic diseases in studied groups**

Variables \ Groups		Group A (no alarm feature) (N = 4)		Group B (with alarm feature) (N = 7)		Total (n = 11)	
Organic Ds	<b>Microscopic colitis</b>	2	8%	2	8%	4	36.4%
	<b>Colorectal cancer</b>	1	4%	2	8%	3	27.3%
	<b>Ulcerative colitis</b>	1	4%	1	4%	2	18.2%
	<b>Crohn's D</b>	0	0%	1	4%	1	9.1%
	<b>Solitary rectal ulcer</b>	0	0%	1	4%	1	9.1%

## DISCUSSION

In our study, there was no statistically significant relation between demographic data as regard age, gender or smoking and the presence or absence of organic colonic diseases and this agree with *Paudel et al. (2018)*. The duration of complaint in patients diagnosed to have no organic colonic disease has a higher mean in patients with organic disease suggesting that the probability of organic disease among patients fulfilling Rome IV criteria of IBS decreased with increasing duration of complain.

In our study, we found that 22% of patients fulfilled Rome IV criteria of IBS had organic colonic diseases. This finding was in concordance with the results of *Patel et al. (2015)* who reported that 24.7% of patients meeting criteria for IBS were found to have organic disease after colonoscopy. *Paudel et al. (2018)* stated that findings at colonoscopic examination were seen in 27.85% of patients. Explanation of these results are that Rome criteria for diagnosis of IBS is symptom based criteria and does not use

conventional measurement of sensitivity and specificity, such as a biomarker. Moreover, there was symptomatic overlap between IBS patients and other gastrointestinal diseases.

In our study, there was a significantly higher prevalence of organic GI disease among those who reported alarm features compared to those without these features. This finding was in concordance with the results of *Patel et al. (2015)* who reported that patients with alarm features were found to have a higher prevalence of organic diseases than patients without alarm features.

In our study, percentage of organic colonic diseases varied with each IBS subtype where the most common subtype that exhibited organic disease was IBS-D group. This agreed with study of *Patel et al. (2015)*. *Paudel et al. (2018)* stated that the most common subtype that exhibited organic disease was IBS-C group. This variation in results may be attributed to difference in sample size and the different nature of organic colonic diseases detected.

In this study, about 54.5% of total patients with organic colonic diseases were IBS-D patients. This result was consistent with *Ishihara et al. (2012)* who reported that IBS-D has the highest contribution to the total number of patients detected to have organic colonic disease.

In the present study, microscopic colitis was the predominant disease. This was comparable with the results of *Patel et al. (2015)*, who found that Crohn's disease was the predominant organic disease. The increased incidence of Crohn's disease in their sample may be attributed to the epidemiological data reporting that crohn's disease has the highest prevalence in well developed areas particularly in Europe and North America (*Abraham and Cho, 2009*). The increased incidence of microscopic colitis in our study may be attributed to the fact that IBS-D represented 42% of total number of studied patients.

In our study the percentage of microscopic colitis was 19% of IBS-D patients. This result was in agreement with *Carmona-Sánchez et al. (2011)* who found the prevalence of microscopic colitis in patients with IBS-D was 18%.

### CONCLUSION

Up to one in six patients meeting criteria for IBS without alarm features in routine clinical practice may have underlying organic GI disease. This increased to one in four patients if alarm features were present, highlighting that the presence of alarm features increased probability of organic colonic diseases among patients fulfilling Rome IV criteria of IBS and absence of alarm features did not completely exclude organic GI

disease. The prevalence of organic GI disease varied according to IBS subtype, suggesting that probability of organic disease in IBS-D patients was higher than IBS-M than IBS-C patients.

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## دور المنظار القولوني في تشخيص الأمراض العضوية في المرضى الذين يعانون من أعراض القولون المتماثلة مع خصائص روما الرابعة

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**خلفية البحث:** تعتبر متلازمة القولون العصبي اضطراباً وظيفياً مزمنياً يصيب الجهاز الهضمي السفلي، ويعانى المرضى المصابون من آلام في البطن وتغير واضطراب في عملية الإخراج، ولا توجد طرق معملية، كما لا توجد دلالات معينة بالدم تعطى تشخيصاً نهائياً محددًا لمتلازمة القولون العصبي. لذا، فإن تشخيص متلازمة القولون العصبي هو تشخيص سريري بشكل كامل. وقد وجد أن أمراض القولون العضوية أحياناً ما تتعرض للتشخيص الخاطي، مع مرضى متلازمة القولون العصبي.

**الهدف من الدراسة:** تقييم دور المنظار القولوني في تشخيص الأمراض العضوية في المرضى الذين يعانون من أعراض القولون المتماثلة مع خصائص روما الرابعة لمتلازمة القولون العصبي.

**المرضى وطريقة البحث:** أجريت هذه الدراسة على ٥٠ مريضاً يقسم أمراض الكبد والجهاز الهضمي والأمراض المعدية بمستشفيات جامعة الأزهر في الفترة ما بين ديسمبر ٢٠١٨ و مايو ٢٠١٩. وقد تم تقسيم المرضى إلى مجموعتين متساويتين: مجموعة (أ) إستوفوا معايير روما الرابعة لمتلازمة القولون العصبي مصاحبة بعلامات منذرة، ومجموعة (ب) استوفوا معايير روما الرابعة لمتلازمة القولون العصبي غير مصاحبة بعلامات منذرة. وقد تم عمل منظار قولوني لجميع المرضى وأخذ عينات من القولون للفحص المجهرى.

**نتائج البحث:** أظهرت الدراسة أن ١١ من ٥٠ مريضاً (٢٢%) ممن إستوفوا معايير روما الرابعة لمتلازمة القولون العصبي لديهم أمراض عضوية بالقولون بنسبة أعلي في الحالات المصاحبه بأعراض منذرة، كما أظهرت الدراسة أن إلتهاب القولون المجهرى هو الأكثر شيوعاً بين هذه الأمراض بنسبة ٣٦,٤%.

كما أظهرت الدراسة أيضاً أن متلازمة القولون العصبي غالب الإسهال هو النوع الأكثر احتمالاً لوجود هذه الأمراض العضوية.

**الإستنتاج:** أوضحت الدراسة أن واحداً من كل ست من المرضى الذين إستوفوا معايير روما الرابعة لمتلازمة القولون العصبي وكانوا غير مصاحبين بأعراض منذرة من المحتمل أن يكون لديهم أمراضاً عضويةً بالقولون مقارنةً بواحد من كل أربع حالات في وجود الأعراض المنذرة.