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Original Research Article

Evaluation of chronic constipation by colonoscopy: Does patient age make a difference?

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Abstract

Most cases of constipation do not require diagnostic evaluation examination beyond anamnesis, a rectal examination and basic laboratory tests. Existence of alarm signs mandates a more extensive evaluation including colonoscopy. The study examined the value of colonoscopy as a function of patient age, i.e. above or below the age of 50, for the detection of significant findings in the evaluation of constipation, mainly malignant processes. Retrospective observational study, Records of 3,482 patients who underwent a colonoscopy as part of a workup for constipation at the Hillel MC between 2000-2014 was reviewed. Patients divided into two age groups, below and above the age of 50. The following data were collected and recorded: additional indications for colonoscopy other than constipation and the colonoscopy findings were recorded and assessed in both patients groups. Data from 3,482 patients, 707 below the age of 50 (20%), and 2,775 above the age of 50 (80%) were summarized. Ten additional indications for colonoscopy were recorded. Normal test results were observed in 457 patients below the age of 50 (65%) and in 1,142 patients above the age of 50 (41%). Colon tumors were detected in 5 patients below 50 (0.7%) and in 54 patients above 50 (1.9%). Colonoscopy identified findings explaining the cause or the results of constipation in both age groups, provides the opportunity to identify the causes of constipation and to detect significant pathology, we support the approach of performing colonoscopy as part ofa workup for constipation at any age.

Key word: Colonoscopy, CRC, Chronic constipation, Alarm signs, ROME diagnostic criteria, Age

INTRODUCTION

Constipation is a very common complaint from which the majority of people suffer at some point of their life. Constipation may manifest as an acute and transient event, or, in about 20% of the general population, mainly females and the elderly, as a chronic disorder (Pare et al., 2001). Constipation may be a primary disorder, related to a motility disorder of the colon or to a structural disorder of the pelvic floor, or secondary to other primary conditions, such as endocrine, neurological or anatomic diseases or the use of medications, or the result of dietary and lifestyle changes (Erichsén et al., 2016). Most cases of constipation do not require any diagnostic evaluation or physiological examination beyond anamnesis, a rectal examination and basic laboratory tests. Initiating treatment with laxatives will be the preferred approach in most cases (American College of

Gastroenterology Chronic Constipation Task Force, 2005). However, the existence of alarm signs in addition to the constipation, such as anemia, weight loss, a family history of malignancy, or new onset of constipation at advanced age, requires a more extensive evaluation (American College of Gastroenterology Chronic Constipation Task Force, 2005). Colonoscopy is a common screening test for colorectal cancer for persons over the age of 50 at average risk. It is commonly assumed that colonoscopy will not provide significant findings in the evaluation of constipation in the younger population. However, colonoscopy is often requested in patients younger than 50 as part of the workup for constipation, whether due to a suspected tumor or with the aim of obtaining clues from the structure and function of the bowel

Constipation is a subjective complaint, which can be described by the patient as the difficult passage of stool, incomplete evacuation or an insufficient number of bowel movements per week (Sandler and Drossman, 1987).

Some specialists classify primary constipation according to the characteristics of intestinal motility: slow transit constipation ornormal transit constipation.

Normal transit constipation is the most common type of constipation. The time of stool passage in the bowel and the frequency of bowel movements are normal, but the patient still complains of constipation. These patients report difficult stool passage, abdominal pain and hard stool. There is a significant overlap between patients of this group and patients with irritable bowel syndrome (IBS) (Eoff, 2008).

Patients with a longer than usual time of stool passage in the colon usually fails to respond to conservative treatment by addition of dietary fibers to their diet. These patients have reduced motor activity, with reduced response of the bowel to the normal situations that occur after a meal and morning awakening (Eoff, 2008; Mertz et al., 1999).

Primary constipation may be also be caused by pelvic floor dysfunction and a lack of coordination in the activity of the anal sphincters: anismus or fecal retention syndrome (Eoff, 2008; Mertz et al., 1999).

Secondary constipation is a symptom that accompanies other pathological conditions, such as organic diseases (colorectal cancer, external pressure on the bowel, inflammatory bowel disease), endocrine diseases (diabetes, hypothyroidism, hypercalcemia etc.), chronic renal failure, neurological diseases (spinal injury, Parkinson's disease, multiple sclerosis, autonomic neuropathy, Hirschsprung's disease, etc.).Other causes of constipation include medications (opioids, antihypertensive drugs, tricyclic antidepressants, iron, etc.), a low fiber diet and the lack of physical activity (Eoff, 2008).

Chronic functional constipation is defined according to Rome IV criteria (Longstreth et al., 2006) as the presence of two of the following symptoms for at least 3 months: less than two spontaneous bowel movements per week, straining during defecation, hard stool, the sensation of incomplete evacuation, the sensation of anorectal obstruction or manual intervention -all these, during more than 25% of all bowel movements. Additional criteria include the absence of loose stools without the use of laxatives, when the patient does not meet the criteria for irritable bowel syndrome (IBS).

The initial approach to the evaluation and treatment of constipation depends on the patient characteristics, including the patient's age and gender, the presence or absence of alarm signs and the patient's medical history (Lindeman et al., 2000). In young patients with no alarm signs, the preferred approach is education for lifestyle and dietary changes (Lindeman et al., 2000). Laxatives are recommended for patients who are incapable of changing their lifestyle or those for whom the lifestyle change was ineffective (Ramkumar and Rao, 2005).

Laxatives assist in the treatment of constipation by softening the stool or facilitating intestinal motility, either artificially or indirectly, by one or more of the following mechanisms: dietary fibers absorb water, thus increasing stool volume and decreasing stool density; osmotic laxatives (e.g. Lactulose or Sorbitol) create an osmotic gradient and absorb water into the bowel; stimulant laxatives (e.g. sodium picosulfate) act locally by increasing intestinal motility and reducing the absorption of water in the colon (Johnson, 2006; Tack and Muller-Lissner, 2009)

A new medication that acts via a different mechanism is Lubiprostone, which affects the chloride channels in the intestinal wall, thus facilitating the secretion of fluids into the lumen. Stool volume is increased and stool density is decreased, thus improving stool passage in the colon 12. (Jentsch, 2008; Cuppoletti et al., 2004)..

Diagnostic evaluation, such as endoscopic and physiological examinations (anorectal manometry, measurement of colonic transit time and the balloon expulsion test), are performed in patients who do not respond to the various laxative types (Johnson, 2006). The common methods initially used for the evaluation of the etiology of constipation are designed to examine colonic motility: the wireless motility capsule and colonic transit time. These tests are suitable for constipation workup in patients who do not respond to treatment with laxatives, and are designed to evaluate potentially reduced motility and slow colonic transit (Wald, 1995). Pressure evaluation by anorectal manometry provides information regarding the function of the anal sphincters during activation of the pelvic floor reflex (Wald et al., 1990).

Colonoscopy enables the identification of lesions that obstruct or narrow the intestinal lumen, thus leading to mechanical constipation. This test is recommended for patients older than 50 years of age who suffer from

Table 1. Number of patients in each age group, below orabove the age of 50

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	age<50	707	20.3	20.3	20.3
	Age>=50	2775	79.6	79.7	100.0
	Total	3482	99.9	100.0	

Table 2. The frequency of additional indications, stratified according to age

Indications	Below 50 N=707	Above 50 N=2,775	P value
Entire sample	707 (20%)	2775 (80%)	
Anemia	24 (3.4%)	137 (4.9%)	P=0.08
Rectal bleeding	97 (13.7%)	209 (7.5%)	P<0.0001
Positive fecal occult blood test	5 (0.7%)	43 (1.5%)	P=0.10
Abdominal pain	170 (24.0%)	575 (20.7%)	P=0.057
Weight loss	13 (1.8%)	143 (5.2%)	P<0.0001
Family history of colon cancer	33 (4.7%)	63 (2.3%)	P=0.001
Diarrhea	20 (2.8%)	16 (0.6%)	P<0.0001
A radiological finding	-	19 (0.7%)	P=0.02
Increased CEA	1 (0.1%)	21 (0.8%)	P=0.066
An anal problem	8 (1.1%)	28 (1.0%)	P=0.84

constipation and have not yet undergone a screening test for colon cancer. In patients younger than 50 years of age, a colonoscopy should be performed as part of a workup for constipation if alarm signs, e.g. rectal bleeding, a positive fecal occult blood test, iron deficiency anemia, weight loss, a history of inflammatory bowel disease or a family history of colorectal cancer, have been identified. Colonoscopy should be also performed prior to surgical intervention for the treatment of constipation (Higgins and Johanson, 2000).

In this study, we examined the value and role of colonoscopy as part of a workup for constipation in patients younger than the age of 50. We examined the correlation between significant colonoscopy findings and patient age. We also evaluated whether the test is justified or unnecessary for the workup of constipation in younger patients, based on clinical considerations as well as considerations of cost effectiveness and risk.

MATERIALS AND METHODS

This retrospective observational study included the review of the medical records of 3,500 patients who underwent a colonoscopy as part of a workup for constipation at the Hillel Yaffe Medical Center Institute of Gastroenterology at between 2000 and 2014. The patients were divided into two age groups, below and above the age of 50 years. The data from the colonoscopy report and its findings, and the complaints associated with the constipation prior to colonoscopy were examined.

Study population

Inclusion criteria

All patients who underwent colonoscopy for the indication of constipation at the Hillel Yaffe Medical Center Institute of Gastroenterology at between 2000 and 2014.

RESULTS

Data from 3,500 patients were reviewed. Complete data were obtained for 3,482 patients. 707 (20.3%) were below the age of 50 and 2,775 (79.6%) were above the age of 50 (Table 1). In addition to the indication of constipation, common to all of the patients, 10 additional indications for colonoscopy were recorded (1.05 per patient): anemia, rectal bleeding, a positive fecal occult blood test, abdominal pain, weight loss, a family history of colon cancer, intermittent diarrhea, suspicious radiological finding, increased CEA and anal complaints (Table 2).

10 different major diagnoses were recorded for 3,482 patients (a mean of 1.6 diagnoses per patient) (Table 3).

Normal test results were observed in 457 patients below the age of 50 (64.6%), compared to 1,142 patients above the age of 50 (41.2%) (P<0.001). Diverticulosis was observed in 11 patients below the age of 50 (1.6%), compared to 54 patients above the age of 50 (1.9%) (P=0.02). Melanosis coli was observed in 24 patients below the age of 50 (3.4%), compared to 111 patients above the age of 50 (4%) (P=0.51). Colitis was recorded

Table 3. The frequency of the diagnoses recorded for the patients

	Number	Percent
Normal Study	1602	46%
Polyps	598	17%
Diverticolosis	457	13%
Hemorrhoids	659	19%
Suspected Colon Cancer	59	1.7%
Melanosis Coli	135	4%
Colitis	22	0.6%
Proctitis	13	0.4%
Poor Preparation	860	25%
Normal Ileoscopy	49	1.4%
	4454	

Table 4. The frequency of the diagnoses recorded in each age group

	Age<50	Age>=50	P
Normal Study	457 (64.6%)	1142 (41.2%)	P<0.0001
Polyps	40 (5.7%)	558 (20.1%)	P<0.0001
Diverticolosis	11 (1.6%)	444 (16.0%)	P<0.0001
Hemorrhoids	128 (18.1%)	528 (19.0%)	P=0.59
Suspected Colon Cancer	5 (0.7%)	54 (1.9%)	P=0.021
Melanosis Coli	24 (3.4%)	111 (4.0%)	P=0.51
Colitis	6 (0.8%)	16 (0.6%)	P=0.43
Proctitis	3 (0.4%)	10 (0.4%)	P=0.74
Poor Preparation	156 (22.1%)	704 (25.4%)	P=0.071

Table 5. The frequency of various indications in patients diagnosed with malignancy, stratified according to age below orabove the age of 50

	Age<50 n=5	Age>=50 N=54	Total	p
Suspected colon Cancer	5 (0.7%)	54 (1.9%)		P=0.021
Anemia	0	8 (14.8%)	8 (13.6%)	P=1.00
Rectal bleeding	3 (60.0%)	8 (14.8%)	11 (18.6%)	P=0.04
Positive fecal occult blood test	0	1(1.9%)	1 (1.7%)	P=1.00
Abdominal pain	1 (20.0%)	7 (13.0%)	8 (13.6%)	P=0.53
Weight loss	0	5 (9.3%)	5 (8.5%)	P=1.00
Family history of colon cancer	1 (20.0%)	0	1 (1.7%)	P=1.00
Diarrhea	0	2 (3.7%)	2 (3.4%)	P=1.00
A radiological finding	0	1 (1.9%)	1 (1.7%)	P=1.00
Increased CEA	0	2 (3.7%)	2 (3.4%)	P=1.00
An anal problem	0	2 (3.7%)	2 (3.4%)	P=1.00

in 6 patients below the age of 50 (0.8%), compared to 16 patients above the age of 50 (0.6%) (P=0.43). Proctitis was diagnosed in 3 patients below the age of 50 (0.4%) and in 10 patients above the age of 50 (0.4%) (P=0.74). Ileoscopy was performed and recorded as normal in 19 patients below the age of 50 (2.7%), compared to 30 patients above the age of 50 (1.1%) (P=0.0003). In terms of colon preparation for the test- "poor preparation" was reported for 156 patients below the age of 50 (22.1%), compared to 704 patients above the age of 50 (25.4%) (P=0.07) (Table 4).

Fifty nine patients were diagnosed with malignancy, of which 5 patients were below the age of 50 and 54 were above the age of 50. Among the 5 young patients diagnosed with a tumor, 3 had an indication of rectal bleeding in addition to constipation, one had a positive fecal occult blood test and one had a family history of cancer.

In the group of 54 patients older than 50 diagnosed with malignancy, additional indications for the test included: anemia, in 8 patients (14.8%); rectal bleeding, in 8 patients (14.8%); abdominal pain, in 7 patients (13%); and weight loss, in 5 patients (8.5%) (Table 5).

DISCUSSION

Constipation is a common complaint in the general population that leads to impaired quality of life for many people. Constipation is a common symptom, which may be experienced by healthy individuals as well as those suffering from apathological condition. The prevalence of constipation in the general population is 12% - 19%, with increased incidence in adults and females; the ratio of females to males 2:1 (Higgins and Johanson, 2000). Possible risk factors for constipation include low socioeconomic status, low education level, a lack of physical activity, medications, depression and a stressful lifestyle (Wald et al., 2008; Locke et al., 2000; Lu et al., 2006; Dukas et al., 2003; Bytzer et al., 2001; Sandler et al., 1990). Constipation is one of the 5 leading causes of visits to gastroenterology clinics (Everhart et al., 1989). It may be an acute and transient event, or become a chronic problem. Its cause may be a multisystem or local problem, with 2/3 of cases caused by an intestinal motility disorder and/or pelvic floor dysfunction, or by a problem related to colon structure (Sonnenberg and Koch, 1989). Most cases of constipation do not require a comprehensive diagnostic evaluation beyond anamnesis, a rectal examination and basic laboratory tests. According to various professional associations, in the absence of alarm signs, the preferred initial approach is the initiation of treatment with laxatives, and only cases of persistent constipation require physiological/ functional evaluation, which may include a rectal balloon expulsion test, imaging of colonic transit, anorectal manometry, etc. (Shaheen et al., 2006).

In general, colonoscopy is not recommended as part of the workup for constipation, unless alarm signs, such as rectal bleeding, a positive fecal occult blood test, iron deficiency anemia, weight loss, a history of inflammatory bowel disease or a family history of colorectal cancer, have been identified (Surrenti et al., 1995). Colonoscopy is recommended for early detection of colon cancer in the average population above the age of 50; therefore the issue of the role of this test in constipation workup at older ages is not critical, since the test is justified in any case. However, at younger age, in which colonoscopy is not considered to be necessary for constipation workup, the issues of cost effectiveness and risks become significantly more important. The aim of this study was to investigate the role and value of colonoscopy in the evaluation of the causes of constipation in persons younger than 50 years of age.

The majority of the patients, about 80%, were in the age group aged50 and older. This may suggest that constipation is indeed more common in the older population, as reported in the literature (Higgins and Johanson, 2000; Wald et al., 2008).

As mentioned above, the primary indication for testing in all the study subjects was constipation, but some of them also suffered from additional symptoms. Abdominal pain was the most common indication in both age groups (13%). CEA is a marker that does not represent the younger group (1/707 in the younger patients vs. 21/2775 in the older patients).

Colonoscopy results were normal in most – 65% of patients in the younger age group whereas in the older group, most of the patients (60%) had findings ($P<0.0001$). These findings are consistent with the assumption that the overall rate of colon diseases increases with age (Chatrenet et al., 1993).

Nevertheless, pathological colonoscopy findings were detected in a considerable proportion of patients below the age of 50, including: hemorrhoids (18%), polyps (5.7%), melanosis coli (3.4%) and diverticulosis (1.6%). Although hemorrhoids, melanosis and diverticulosis may cause constipation, they may also result from it. Colon preparation and cleanliness were similar in both age groups. Poor preparation was recorded in 22-25% of tests. Anal complaints such as fissure and rectal prolapse were identified in a minority of patients in both age groups (3-4%). These findings may be also related to the cause or the result of constipation. Polyps were detected in 20% of the older age group subjects and in 6% of the younger age group subjects. The statistically significant difference reflects the known increase in the incidence of polyps with increasing age (Lieberman et al., 2008).

The most significant finding was malignant colon tumor. According to the literature, the incidence of colon cancer in the asymptomatic population with an average risk is 48/100,000 (0.005%) (Ries et al., 1997). The detection of colon cancer in the younger population with no distinct risk factors is rare. Colon cancer at young age is usually associated with familial genetic syndromes. In this study, although tumors were identified in 5 patients below the age of 50 (0.7%), it must be kept in mind that they were not asymptomatic subjects.

Interestingly, all the 5 young patients diagnosed with a tumor had an additional indication for the test in addition to constipation: 3 subjects of the young group had rectal bleeding, one subject had a positive fecal occult blood test, and one subject had a family history of cancer.

The incidence of tumors was even higher in subjects older than 50 years of age (54 subjects, 1.9%). In this group, additional indications for colonoscopy included anemia (15%), rectal bleeding (15%), abdominal pain (13%) and weight loss (8%), but in practice, 25% of the patients had only constipation as the reason for colonoscopy. This supports the notion that there is no

need to search for multiple indications to perform a colonoscopy in older patients.

In subjects below the age of 50, the frequency of rectal bleeding was 14%; 3 out of the 5 patients diagnosed with a tumor suffered from rectal bleeding. Thus, rectal bleeding maybe considered a significant and important alarm sign. However, it should also be remembered that no tumor was diagnosed in most of the subjects below the age of 50 with rectal bleeding. Thus, although rectal bleeding is not necessarily associated with malignant pathology, it requires endoscopic examination if present.

The 5 young patients diagnosed with malignancy displayed an alarm sign in addition to constipation. This suggests that it is extremely important to address all of the symptoms, in order to create a comprehensive picture of patient's condition beyond the complaint of constipation itself.

Based on previous studies, the value of colonoscopy in the evaluation of constipation as an isolated indication in the group of patients below the age of 50 is low, and its value does not increase in the evaluation of asymptomatic patients who undergo colonoscopy as a screening test (ASGE Standards of Practice Committee et al., 2014). The incidence of malignancy observed in the younger patients was lower than that found in colonoscopy screening tests (Obusez et al., 2012). Diagnostic colonoscopy is associated with the risk of a serious side effect – perforation of the colon, the incidence of which is about 0.1% or less (Lohsiriwat, 2010).

Based on the results of this study, we support the use of colonoscopy as part of the workup for constipation even in patients below the age of 50. Malignancy was diagnosed in both age groups, although it was associated with additional indications for the performance of a colonoscopy and the presence of alarm signs, mainly in the younger age group. In the older population, constipation itself constitutes an alarm sign, especially if it is not chronic. Thus, in older people, malignancy can present as constipation alone. In younger populations, emphasis should be placed on questioning the patient regarding the presence of additional alarm signs and if such signs are present, colonoscopy must be recommended.

CONCLUSION

According to the literature and in accordance with standard guidelines, constipation alone does not require a colonoscopy, unless it is accompanied by alarm signs. Usually the reason is functional and based on considerations of cost effectiveness and the risks of colonoscopy – the patient is not necessarily referred for this examination. In patients older than 50, colonoscopy is justified in view of the fact that colon screening is in any case recommended for this age group. This study modifies our standard approach to the evaluation of constipation by colonoscopy with respect to age. Findings were detected in about 60% of the tests performed in the older age group and in about 40% of the tests performed in the younger age group. Some of the findings, such as polyps, were significant in and of themselves, while other findings were either the cause or the result of constipation. Colon cancer was diagnosed in about 2% and 1% of the older and younger patients, respectively. Thus, colonoscopy provides an opportunity to identify the causes of constipation and to detect significant pathology, as well as the opportunity to reassure the patient regarding the condition of his colon. In view of the above, and based on considerations of cost effectiveness and risk, we support the approach of performing a colonoscopy as part of the workup for constipation at any age.

Limitations of the study

Our study has several limitations:

- It is a retrospective study.
- The effect of the level of colon preparation on the interpretation of various findings and the ability to detect minor findings.
- Variability in the interpretation of endoscopic findings among different performing specialists.

Conflict of Interest: None

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