

Original Research Article

Evaluation the results of colon transit time in patients with chronic constipation resistant to treatment

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ABSTRACT

Background: Determining colon transit time (CTT) is one of the simplest, reproducible, safe, inexpensive, reliable, patient-acceptable and fully applicable methods in the evaluation of patients with constipation. Objective was to determine the results of colon transit time (CTT) in patients with chronic drug resistant constipation.

Methods: In this study, 30 people with constipation for at least three months and had defecation at most twice a week and did not respond to basic treatments were studied from October 2019 to June 2021 at Ardabil city hospital. 20 metal markers were given orally. Abdominal x-ray was performed on the 6th day and the number and speed of markers were considered. Patients also discontinued their anti-constipation medications. According to the CTT pattern, the causes of refractory chronic constipation were identified.

Results: Of all 30 patients, 13 (43.3%) were male and 17 (56.7%) were female. The mean age of patients was 45.4 years with a standard deviation of 15.92. The greatest number of underlying diseases was related to blood pressure with 10 cases (33.3%). Of all patients, 19 patients (63.3%) had normal transit time colon despite chronic constipation. In terms of disorders; 5 patients (16.7%) had colon inertia, 3 patients (10%) had outlet obstruction and 3 patients (10%) had hindgut dysfunction. There was no significant relationship between colon transit time outcomes and patients' gender and age.

Conclusions: Examination of transit time colon in patients showed that the finding was normal in most of cases.

Keywords: Colon transit time, Constipation, Resistant chronic constipation

INTRODUCTION

Constipation is a common symptom in functional bowel disorders that can reduce the frequency of normal bowel movements.¹ Although most people experience bowel movements at least three times a week, excessive bowel movements are unusual in people with constipation. Most patients with constipation report symptoms such as mild or hard stools. Severe constipation (bowel movements 2 times a month) is more common in women.²

People with constipation suffer from symptoms such as loss of bowel movements, bloating, inability to empty

and painful emptying for weeks. Studies show that constipation affects 2 to 34% of adults in the studied population and has a higher prevalence of complications.³ Approximately, 65% of people who suffer from constipation self-medicate and use minerals and do not seek specialized medical treatment.⁴ In Iran, the overall prevalence of functional bowel disorders in patients referred to gastroenterology clinics has been reported as 40.1%.⁵ This disorder becomes chronic in a quarter of cases, sometimes severe and sometimes tiring, and affects people's quality of life. Patients usually take laxatives to reduce symptoms.⁶ Constipation can cause many complications and problems.

Chronic obstruction leads to injury on the anterior rectal wall (rectal ulcer syndrome).⁷ After some time, this stress may cause fissures, hemorrhoids, rectoceles, rectal ulcers, and in complicated cases, sphincter damage and anal incontinence. People suffer from painful defecation which often puts them under stress. Excessive stress adds to their problems and the cycle continues. Descending perineum syndrome (DPS), which is caused by intense and repeated pressure, can lead to anal prolapse.⁸

Chronic constipation can be divided into two primary (functional) and secondary groups. Primary constipation itself is divided into 3 groups: normal transit or irritable bowel syndrome, slow transit, and pelvic floor muscle dysfunction (functional bowel disease).⁹ Many patients may be classified in more than one group. Secondary constipation occurs due to illness or drug use. Secondary causes of constipation include: mechanical causes (rectal and colon cancer), endocrine or metabolic causes (hyperthyroidism, diabetes, hypercalcemia, uremia), neurological disorders (MS, Parkinson's), drugs (opioids, antidepressants) and systemic (lupus, scleroderma).¹⁰

The role of pelvic floor muscles in constipation was first introduced in 1978 by Martelli.¹¹ The prevalence of this type of constipation is not well known, but it is estimated that 25% to 50% of chronic constipation is in this category, which shows how common pelvic floor disorders are. Pelvic signs of constipation include: inability to empty the rectum, rectal fullness, rectal pain, receiving hand assistance to apply pressure on the posterior vaginal wall or perineum to induce bowel movement.¹²

Many clinical methods including history taking, colon transit time CTT, anorectal manometry and defecography and electromyography (EMG) have been suggested to evaluate the function of pelvic floor muscles in constipation. Despite the evidence that shows that there is a dysfunction of the pelvic floor muscles in a high percentage of patients with chronic constipation, sometimes the diagnosis and treatment are not done correctly. Patients with constipation try to solve their problem with laxatives, which not only do not solve the problem, but also face side effects of the drug.¹³

Determining colon transit time (CTT) is one of the simple, repeatable, safe, cheap, reliable, acceptable by the patient and completely applicable method in evaluating patients with constipation. One of the most important benefits of CTT is that if it is normal, the patient can be reassured that his bowel movements are normal, which leads to the relaxation of the patient and, in turn, help to cure his constipation. In addition, by using this diagnostic method, various causes of constipation such as colonic inertia and outlet dysfunction can be diagnosed, and with the proper treatment of these patients, recovery is achieved as quickly as possible.¹⁴

Therefore, according to the limited studies in this field, the aim of this research was to investigate the results of colon transit time (CTT) in patients with chronic constipation resistant to treatment.

METHODS

This cross-sectional descriptive study was conducted in the radiology department of Ardabil city hospital from October 2019 to June 2021. In this study, 30 patients (13 men and 17 women) who were constipated for at least three months and the frequency of defecation in them was at most 2 times a week, and don't respond to the primary treatments included increasing dietary fiber, physical activity, regular food consumption and training, were included in the study. 20 metal markers were given orally. Abdominal x-ray was performed on the 6th day and the number and speed of markers were evaluated. Patients were asked to discontinue their anti-constipation medications during the study. According to the CTT pattern, the causes of treatment-resistant chronic constipation were identified. Three subtypes of slow transit time colon were investigated based on the markers observed in the patients' x-rays. If the slowness of the colon transit time is more in the navel of the ascending colon, it is the result of colon inertia. If it is in the descending colon area, it is the result of hindgut dysfunction and if it is in the rectosigmoid area, it is the result of outlet obstruction. Demographic characteristics of patients and also CTT results were collected by using a checklist. Patients with a history of taking constipating drugs, pregnant women, patients with a history of colon and rectal surgery, a history of hypothyroidism and a history of untreated underlying diseases, and diabetic patients were excluded from the study. Data were analyzed in SPSS version 25 by using descriptive statistical methods and chi-square test. This study was approved by the ethics committee of Ardabil University of Medical Sciences, Ardabil, Iran (approval code: IR.ARUMS.REC.1399.192).

RESULTS

Of all patients, 13 (43.3%) were male and 17 (56.7%) were female. The average age of the patients was 45.4 ± 15.92 years. The average age of women was 39.29 ± 10.8 years and men was 53.4 ± 18.3 years. The most underlying disease was related to blood pressure with 10 (33.3%) (Table 1).

20 patients (70%) had normal colon transit time despite suffering from chronic constipation. In terms of disorders; 5 people (16.7%) had colon inertia, 3 people (10%) had outlet obstruction, and 3 people (10%) had hindgut dysfunction. No significant correlation was found between colon transit time results and patients' gender (Table 2).

Table 1: Distribution of patients in terms of underlying diseases.

Underlying diseases	Men		Women	
	n	%	n	%
Blood pressure	8	61.5	2	11.8
Blood fat	1	7.7	2	11.8
Heart diseases	2	15.4	0	0
Asthma	0	0	1	5.9
Psoriasis	1	7.7	0	0
Depression	0	0	1	5.9
No underlying disease	1	7.7	11	64.7

Table 2: Correlation between colon transit time results and gender of patients.

Result	Men		Women		P value
	n	%	n	%	
NORMAL	7	53.85	13	76.47	0.608
Colon inertia	3	23.08	2	11.76	
Outlet obstruction	2	17.38	1	5.88	
Hindgut dysfunction	1	7.69	1	5.88	

The average age of patients with colon inertial disorder was 57.4 ± 10.4 more than other disorders.

No significant correlation was found between colon transit time results and patients' age (Table 3).

Table 3: Examining the relationship between colon transit time results and patients' age.

CTT results	Mean age	SD	P value
Normal	41.1	13.91	0.371
Colon inertia	57.4	10.41	
Outlet obstruction	49.6	9.67	
Hindgut dysfunction	36.6	3.3	
Total	45.4	15.29	

DISCUSSION

19 patients (63.3%) had normal colon transit time despite suffering from chronic constipation. In terms of disorders; 5 people (16.7%) had colon inertia, 3 people (10%) had outlet obstruction, and 3 people (10%) had hindgut dysfunction. There was no significant correlation between the colon transit time results and the gender and age of the patients. In the study of Amirbeigi et al, which was conducted as the estimation of colon transit time in people with chronic idiopathic constipation, patients with chronic constipation who met the conditions for entering the study took 30 contrast markers in two capsules (15 inside each capsule) in the morning and plain radiography of the abdomen was done after 120 hours. In normal people, only 20% of markers (up to 6 markers) are expected to remain, then the cases where more than 6 markers remained are considered according to the location of the marker inside the right, left, rectosigmoid colon, colon inertia or colon emptying disorder. In this

study, 43 patients who had a maximum of 2 bowel movements per week for more than 3 months and did not respond to initial treatments including increasing dietary fiber and physical activity, did not take constipating drugs and had underlying neurological diseases such as Parkinson's, multiple sclerosis, stroke, hypothyroidism, diabetes, addiction and no history of abdominal surgery were included in the study, 40 patients completed the study. Of all patients, 55% of cases (22 people) had normal CTT despite chronic constipation, 17.5% (7 people) had colonic inertia, 7.5% (3 people) had emptying disorder and 20% of cases (8 people) had colonic inertia and they had discharge disorder. In older age and patients with less frequent bowel movements, CTT was longer. Although in this study 16 patients were male and 24 patients were female, there was no significant difference in colon transit time (CTT) between men and women.¹⁵ In the present study, which was conducted in Ardabil city, 66.7% of patients with chronic colonic constipation had normal colon transit time, which was slightly more than the study of Amirbeigi et al. Also, in the present study, 16.7% of the patients had colon inertia, which was slightly less than the study by Amirbeigi et al probably, the reason for this difference can be seen in the nutritional habits and the difference between the people of these two cities, as well as other causes that need a wider study.¹⁵ In the present study, the colon transit time was not significantly different between men and women. In the study by Ansari et al, which was conducted under the title of comparison of colon transit time in irritable bowel syndrome with the predominant symptom of constipation and chronic constipation, adults with constipation were divided into FC and C-IBS groups based on the Rome II criteria. Both groups used 10 markers of radiopaque daily for 6 consecutive days, and on the seventh day, plain abdominal radiography was performed. The number of markers in the right and left

colon and rectosigmoid were counted and the transit time of the colon and each part of the colon was calculated in hours. 45 FC patients and 45 C-IBC patients were included in the study. Colon transit time was normal in 42% of FC patients and 55% of C-IBC patients. The average transit time of the whole intestine in FC patients was longer than in the IBS group, but it was not significant. The average rectosigmoid transit time was significantly longer in FC patients than in IBS group (p value= 0.008). No significant difference was observed in the right and left colon.¹⁶ 66.7% of the patients in the present study had normal colon transit time, which was slightly higher than the study by Ansari et al. Song et al's study entitled colon transit time according to physical activity in adults was done in 2012.¹⁷ 49 people were included in the study, including 24 men and 25 women. In this study, colon transit time was significantly longer in women than in men. While in the present study, this finding was not significant and in this case there was a difference between our study results with the study of Song et al.¹⁷ Due to the COVID-19 pandemic, we could not collect more patients in this study and so our sample in this study was less and this is our study limitation.

CONCLUSION

Evaluation of colon transit time in patients showed that this finding was normal in most cases and in terms of disorders, colon inertia, outlet obstruction, and hindgut dysfunction are the most common. It is suggested that this study be done on a large scale and with a larger sample size at other times. It is also suggested to investigate the nutrition of patients and the amount of fiber consumed in meals and their effect on the results of colon transit time of patients.

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Conflict of interest: None declared

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