Diagnostic and Interventional Endoscopy

Research Article

Anorectal Manometry Results of Patients Presenting with Chronic Constipation: Single-Center Outcomes

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Abstract

Objective: Anorectal manometry serves as a diagnostic tool, particularly in identifying chronic constipation associated with rectal evacuation disorders. We aimed to share the anal motility results of patients presenting with constipation complaints in our tertiary referral center's motility laboratory.

Methods: Between January 2018 and December 2022, a total of 87 patients presenting with constipation complaints underwent anal motility measurements at İzmir Tepecik Training and Research Hospital, Clinic of Gastroenterology. Eighty-nine patients without constipation complaints were included in the study.

Results: It was determined that 87 patients presented with constipation complaints. The mean age of these patients was 45.42 ± 16.34 years. Of these patients, 61 were female and 26 were male. Regarding motility measurements, an increase in resting pressure, a higher volume at which they first felt the urge to defecate, a decrease in the maximum tolerable volume, and an increase in the incidence of dyssynergia, predominantly type I dyssynergia, were observed in constipated patients. However, no statistically significant relationship was found between patients' resting pressures, initial sensation measurements, maximum tolerable volume, dyssynergia, average resting pressure, squeezing pressure, and constipation (respectively; *P*: .28, *P*: .39, *P*: .76, *P*: .41, *P*: .095).

Conclusion: In our study, our anorectal motility results were not found to be associated with the presence of constipation. However, with a larger number of patients compared to many studies and the results obtained from anorectal manometry performed at very few centers, we believe that some of our findings will be instructive for constipation patients.

Keywords: Constipation, anorectal manometry, dyssynergic defecation

INTRODUCTION

It has been determined that 10%-20% of adults worldwide complain of chronic constipation.[1] Constipation has been noted to have a negative impact on social, psychological, and mental health in affected individuals. It has been estimated to cost approximately 230 million dollars annually in the United States.[2-6] Chronic constipation, defined according to the criteria of the Rome IV international study committee, currently ranks among the most common reasons for doctor visits.[7] Chronic constipation can have numerous causes, making it a challenging condition to characterize due to a variety of etiologies such as metabolic disorders, the use of constipation-inducing medications, irritable bowel syndrom (IBS), or defecation disorders.[8] More severe conditions, such as intestinal obstruction or neurological diseases like Parkinson's disease, or connective tissue disorders like Ehlers-Danlos Syndrome, can lead to constipation but are rare.[8]

Anorectal manometry (ARM) is a method that can dynamically measure intraluminal pressure, evaluating anal and rectal motor and sensory functions, and assisting in diagnosing evacuation disorders such as chronic constipation and fecal incontinence that are unresponsive to standard conservative or medical treatments.[9,10] According to manometric technology, ARM is divided into conventional or high-resolution manometry (HR-ARM) and three-dimensional high-definition anorectal manometry (3DHD-ARM). Anorectal manometry allows for the evaluation of various functions of the anorectal region, including recto-anal reflex activity, anal sphincter function, recto-anal coordination during stimulated defecation, and rectal sensory function.[11]

In this study, we aimed to share the anal motility results of patients presenting with constipation complaints in our tertiary referral center's motility laboratory.

METHODS

Patients

Between January 2018 and December 2022, a total of 87 patients who presented to the Tepecik Training and Research Hospital, Department of Gastroenterology, and underwent anal motility measurements due to complaints of constipation were included in the study. Additionally, 89 patients who underwent anorectal manometry for reasons other than constipation complaints were also included. Patients for whom complete data could not be accessed in the hospital's motility laboratory were excluded from the study. The presence of additional diseases in patients was classified according to coronary artery disease (CAD), diabetes mellitus (DM), autoimmune diseases, hypertension (HT), chronic obstructive pulmonary disease (COPD), chronic kidney disease (CKD), thyroid disease, liver cirrhosis, and neurological diseases. Surgical procedures that patients had undergone were recorded. Informed consent was received from each patient prior to the procedure, confirming participation in the study.

Ethical Approval

Ethical approval was obtained from Tepecik Training and Research Hospital Non-Interventional Ethics Committee under protocol number 2022/04-02.

Anal Motility Measurements

For anorectal manometry, patients were administered one cleansing enema at least 2 hours prior to the procedure. After being taken to the motility measurement room, which provided a comfortable and quiet environment, patients were positioned in a semi-flexed, left lateral decubitus position with their heads resting on a pillow. Following a digital rectal examination, the anorectal manometry measurement catheter was gently inserted into the anal region, advancing 6 cm from the anal verge.

Various maneuvers were performed on patients during the measurements. Initially, patients were asked to lie quietly without speaking for approximately 5 minutes to relax. In this manner, resting pressure was measured for baseline anal resting tone assessment. After the resting pressure measurement, to detect anal contractility, a 60-seconds rest was applied followed by four sets of squeezing pressures at 5-seconds intervals between each squeeze, with 30 seconds of rest. For prolonged squeezing pressure measurement, participants were instructed to squeeze the anal canal tightly for 30 seconds. After the squeezing pressure measurement, patients rested for 60 seconds, and then they were asked to push downwards for 15 seconds (as if defecating) to measure the pressure during the push. This was repeated three times with 30-seconds intervals. Following the push/strain pressure measurement, participants were asked to cough forcefully twice with 30-seconds intervals to measure the pressure during coughing.

Rectoanal inhibitory reflex (RAIR) was measured by providing rapid rectal distension to the patients using a balloon. It was evaluated whether anal relaxation exceeded 25%.

Rectal sensation was measured using a rectal balloon filled with air in increments of 10 mL up to a total of 300 mL. The participant's first sensation, urge to defecate, and sensation of defecation corresponding to these three volumes were recorded.

All measurements in this study were conducted in accordance with the London guidelines.[12]

An MMS (Netherlands) brand anal manometry device was used for the measurements.

Statistical Analysis

Statistical analyses in the study were conducted using statistical Package for the Social Sciences (SPSS®) version 22.0 (IBM SPSS Corp.; Armonk, NY, USA). In the descriptive findings section, categorical variables were presented as numbers and percentage, while continuous variables were presented as mean ± standard deviation and median (minimum, maximum values). For the comparison of categorical variables, the Pearson Chi-Square test and Yates' corrected chi-square test were employed; for variables indicated by measurements, the Mann-Whitney U test and Kruskal-Wallis test were used. A *P* value less than .005 was considered statistically significant.

RESULTS

It was determined that 87 patients presented with complaints of constipation. The average age of patients presenting with this complaint was 45.42 ± 16.34 years (range: 14-74). Of these patients, 61 were female, and 26 were male (Table 1). Based on the surgeries undergone by patients with constipation complaints, 8 patients had surgeries related to the gastrointestinal system, 1 patient had chest surgery, 4 patients had vertebra surgery, 6 patients had perianal surgery, and 7 patients had surgeries related to gynecological diseases.

The distribution of patients according to their comorbidities was as follows: 12 patients had diabetes mellitus (DM), 14 patients had hypertension (HT), 3 patients had coronary artery disease (CAD), 1 patient had chronic obstructive pulmonary disease (COPD), 2 patients had chronic kidney disease (CKD), 2 patients had neurological diseases, and 8 patients had thyroid disease. Among the 87 patients, 37 were found to have comorbidities. When examining the relationship between comorbidity and constipation in patients, no statistically significant findings were observed.

Regarding the motility measurements of the patients, an increase in resting pressure was observed in patients with complaints of constipation. Additionally, the volume at which they first felt the urge to defecate was higher, a decrease was noted in the maximum tolerable volume, and an increase was observed in the rate of dysynergia, predominantly type I dysynergia, among constipated patients (Table 2). However, no statistically significant relationships were found between the patients' resting pressures, initial sensation measurements, maximum tolerable volume, dysynergia, average resting pressure, squeezing pressure, and constipation (respectively; *P*: .28, *P*: .39, *P*: .76, *P*: .41, *P*: .095).

DISCUSSION

Chronic constipation ranks among the leading reasons for presentation to primary healthcare facilities, gastroenterology departments, and emergency services. Both prescribed and over-the-counter laxatives pose a significant burden on the healthcare system due to the investigations conducted for these patients.[13-15]

Table 1. Distribution of Patients by Age and Gender

	Age	*P* Value	Gender	*P* Value
Constipated	45.42 (14-74) ± 16.34	.007	Men: 26 women: 61	.353
Non-constipated	52.07(17-78) ± 16.14		men: 27 women : 62	

Table 2. Manometry Measurement Values of Constipated and Non-Constipated Patients

	Constipated (n : 87)	Non-Constipated (n : 89)
Number of patient with normal resting pressure (n)	21	23
Number of patients with decreased resting pressure (n)	61	65
Number of patients with increased resting pressure (n)	5	1
Number of patients with normal initial sensation (n)	5	2
Number of patients with decreased initial sensation (n)	13	13
Number of patients with increased initial sensation (n)	69	74
Number of patients with normal maximum tolerable volume (n)	20	18
Number of patients with decreased maximum tolerable volume (n)	38	44
Number of patients with increased maximum tolerable volume (n)	29	27
Any type of Dyssynergia	46	41
Recto-anal inhibitory reflex	87	89
Average resting pressure	47.14 ± 16.17	44.38 ± 19.38
Squeezing pressure (mean)	81.41 ± 59.42	85.14 ± 70.93
Initial sensation value (mean)	87.05 ± 34.15	82.31 ± 39.87
Maximum tolerable volume (mean)	213.88 ± 52.46	205.63 ± 62.24

Chronic constipation is divided into two main types: disorders associated with colonic transit time (slow and normal transit) and disorders related to rectal evacuation. Anorectal manometry is an anorectal test that uses pressure sensors to measure anal sphincter pressures and rectal pressures during defecation.[16] It serves as a guiding tool, especially in diagnosing chronic constipation associated with rectal evacuation disorders. Colon manometry has been under investigation for over 30 years; however, the prolonged duration of the examination, the high risk of catheterization, the large amounts of real-time data, the sterilization of solid catheters, and the high cost of disposable equipment limit its widespread application.[17]

During the anorectal manometry test, which is applied in very few centers, after measuring pressures during defecation, a solution to the patient's constipation complaint is attempted to be found through a treatment method called biofeedback or exercises.

In our study, it was determined that the majority of patients presenting with chronic constipation were women. However, diverse results have been obtained in studies conducted on this matter. In a study by Abe et al, it was found that, similar to our study, more women presented with constipation complaints, but the rates of dyssynergic defecation were more common in men.[18] In a systematic review with meta-analysis by Alexandra R. Ortengren and colleagues, chronic constipation was found to be common in women with an average age of 51.[19] Similarly, in our study, the average age was found to be 45.

In the measurements performed during anorectal manometry, rectoanal inhibitory reflex (RAIR) was positive in all patients, both with and without constipation. Rectoanal inhibitory reflex is a marker used to exclude megacolon and Hirschsprung's disease.[20] Thus, we excluded existing diseases in our patients as the cause of constipation. We attributed the presence of positive RAIR in all patients to their being adults.

In our study, with an average resting pressure of 47, it was similar to the study by Poos et al but lower than the study by Bjørsum-Meyer T et al and higher than the study by Cuong et al conducted in Vietnam.[21-23] It is thought that the difference in the manometry measurement systems used in the studies and the difference in the demographic data of the patients might cause this discrepancy.

We found that most of our patients had higher initial sensation measurement values according to our center's reference values. We observed that the average initial sensation measurement values of 87 were higher compared to other studies, including healthy groups.[23] We can say that including only the healthy group constitutes the main difference.

The average maximum squeezing pressure of our patients was 81, which has been similarly observed in constipation studies examining dyssynergic defecation.[24]

We identified type I dyssynergic defecation in most of our patients presenting with constipation. In a study from Denmark with a limited number of patients, it was similarly found that type I dyssynergia was frequent.[22] In a study by Mion et al, consistent with other studies, type I dyssynergia was most commonly observed in 40 constipated female patients.[25]

Although type I dyssynergic defecation was frequently encountered in our study, no statistically significant difference was found between patients without constipation complaints. Similarly, studies have indicated that approximately 90% of asymptomatic individuals and those presenting only with chronic proctalgia without constipation exhibited a dyssynergic pattern. Particularly, type I and type IV dyssynergic patterns were reported to be frequent.[26,27] It is thought that the left lateral position used during anorectal manometry measurements is not a physiological defecation position, and patients' discomfort in this position might have influenced this situation.

Among the limitations of our study are the inability to measure colonic transit time, the fact that measurements not performed with a high-resolution manometry system, and the constipation severity of patients was not being objectively determined.

In our study, the results of anorectal motility were not found to be associated with the presence of constipation. However, with a larger number of patients compared to many studies and obtaining results from anorectal manometry performed in very few centers, we believe that some of our findings will be guiding for constipated patients.

Ethics Committee Approval: Ethical committee approval was received from the Tepecik Training and Research Hospital Non-Interventional Ethics Committee (2022/04-02).

Informed Consent: Informed consent was obtained from the patients who agreed to take part in the study.

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