

Effects of the constipation treatment in women who have overactive bladder and functional constipation

 Serkan Akan,  Omer Yilmaz,  Caner Ediz,  Serkan Yenigurbuz,  Cumhuri Yesildal

Sultan Abdulhamid Han Education and Research Hospital, Clinic of Urology, Istanbul, Turkey

Copyright © 2020 by authors and Annals of Medical Research Publishing Inc.

Abstract

Aim: In adults, functional constipation (FC) is more common in individuals with overactive bladder (OAB) than in those without OAB. In this study, we evaluated the effects of the constipation treatment on OAB symptoms in women who have OAB and FC.

Material and Methods: A total of 417 patients, diagnosed with OAB and FC in our clinic between June 2016 and June 2019, were prospectively evaluated. After applying the exclusion criteria, 54 female volunteers between 50-79 years of age were enrolled in the study. FC treatment of the individuals, who were first examined in the Urology clinic, were accomplished under supervision of a gastroenterologist. Internationally validated questionnaires Rome IV and OAB-V8 were used in diagnosis and follow-up of FC and OAB, respectively.

Results: The mean OAB-V8 scores before and after the treatment of constipation were 25.21 ± 6.16 and 14.81 ± 5.93 , respectively. Among all questions, statistically significant decrease was observed especially 1st, 3rd, and 6th questions (frequency, urgency, nocturia). After FC treatment alone, the total OAB-V8 score decreased below the level of the sensitivity and specificity cut-off value for the diagnosis of OAB in 13 patients (24%).

Conclusion: OAB and FC are common clinical problems in the middle-aged and elderly women. In these patients, FC treatment before OAB medication may reduce frequency, urgency and nocturia symptoms of OAB significantly.

Keywords: Constipation treatment; female patients; functional constipation; overactive bladder

INTRODUCTION

OAB is defined by the International Continence Society as urinary urgency, with or without urge urinary incontinence, usually with frequency and nocturia. Urinary frequency and nocturia may be associated with OAB in the absence of pathologic or metabolic conditions such as urinary tract infections, polyuria, transitional cell carcinoma of the bladder, and underlying neurologic abnormalities (1).

Urination and defecation functions are the basic body functions, which are interrelated anatomically and physiologically. In embryologic hindgut, the bladder and intestines move together in fetus (2,3). Motor innervation of both systems is provided through the parasympathetic system (S2-S4); and the smooth muscle sphincters originate by pudendal nerve from the Onuf's nucleus in S2-S4. In addition to this embryological and anatomical partnership, mechanical compression due to constipation may result in trigone irritation, bladder wall invagination, and finally bladder neck-urethral obstruction (3,4). Partial denervation of the detrusor muscle with increased intra-bladder pressure occurs in bladder outlet obstructions.

This denervation disappears before it is transmitted to adjacent muscle cells. However, if a large number of denervations occur, the action potential is transmitted to adjacent cells and causes activity in the detrusor muscle.

In adults, an association of urinary disorders with functional constipation (FC) was also documented, with FC being more common in individuals with overactive bladder (OAB) than in those without OAB (5). Especially in the middle-aged and the elderly women, OAB and FC are common clinical problems. In this study, we evaluated the effects of the constipation treatment on OAB symptoms in women who have OAB and FC.

MATERIAL and METHODS

Patient Population

A total of 417 patients diagnosed with OAB and FC in our clinic between June 2016 and June 2019 were prospectively evaluated. Institutional review board (IRB) approval was acquired from our University Ethics Committee. Informed consent was obtained from all study participants.

Received: 29.01.2020 Accepted: 04.03.2020 Available online: 18.03.2020

Corresponding Author: Serkan Akan, Sultan Abdulhamid Han Education and Research Hospital, Clinic of Urology, Istanbul, Turkey

E-mail: drserkanakan@hotmail.com

Inclusion and Exclusion Criteria

Patients who were between 50 - 79 years of age and had OAB and FC symptoms were included in the study. In diagnosis, after a detailed history and physical examination; urinalysis, urine culture, post-void residual urine measurement, bladder diary and symptom questionnaires were used. Urinary ultrasonography, urodynamic study, and cystoscopy, which are not recommended in initial workup of non-complicated patients, were not carried out. Patients who were found to have missing data during data recording, evaluation or analysis were excluded. Also, patients with a urinary infection, thyroid disease, neurological disease or diagnosed gastrointestinal and urinary tract abnormalities which need regular medical follow-up, history of bladder or colorectal cancer and use of antimuscarinic drugs or laxatives were not included. Finally, 54 women aged from 50 to 79 years were enrolled with available data in the study.

Study Design

The purpose of this study is to evaluate the effects of the treatment of the constipation in patients with OAB. OAB and FC were diagnosed with validated OAB questionnaire V8 (OAB-V8) and Rome IV constipation criteria, respectively. OAB-V8 includes the first eight questions of OAB-q (Overactive Bladder Questionnaire) and is recommended as a screening and symptom questioning test in both of wet and dry OAB patients (6). OAB-V8 questionnaire consists of 8 questions each of which can be graded by the patient within a scale of never (0), few (1), sometimes (2), quite a few (3), usually (4), and always (5). Thus, the lowest total score is 0 and highest total score is 40. The Turkish version of OAB-V8 showed excellent internal consistency and reliability, and test-retest correlation of the test, another measure of reliability, was found to be very high. In this study, cut-off value was calculated as 11.5 with a sensitivity of 80% and a specificity of 78% in the diagnosis of OAB (7).

Presently, Roma IV criteria is the most common instrument used for clinical diagnosis of the bowel dysfunction (8).

The Rome IV criteria include six items related to defecation: straining, lumpy or hard stools, sensation of incomplete evacuation, sensation of anorectal blockage, manual maneuvers to facilitate defecation and ≤ 3 defecations per week. Individuals were accepted as constipated if they had at least two of the above-mentioned symptoms for three months in last six months.

Patients, who were included in the study, received the treatment of the constipation, which included co-organized diet and laxatives by the gastroenterologists' order, in the first month of the protocol. These patients were observed in every two weeks. The treatment was continued at least six months in order for the patients, who acquired at least 4 defecations a week and stool with normal amount and consistence, to gain normal bowel habits. Individuals with constipation unamenable to conservative methods were excluded. In patients who confirmed the improvement of defecation functions according to Rome IV criteria, each question in OAB-V8 was re-evaluated. Higher scores indicate a greater severity of symptoms and, consequently, reflect greater impact of individual symptoms on patient's quality of life.

Statistical Analysis

All analyses were performed using Stata software (version 22; Stata Corp, Texas, USA). Descriptive analyses were presented as mean and standard deviation. In the analysis of the data, the normality hypothesis was investigated using the Kolmogorov-Smirnov test. Student's unpaired t-test was used for comparing continuous variables. The results were evaluated at 95% confidence interval and $p < 0.01$ significance level.

RESULTS

Mean age of 54 patients was 61.34 ± 9.76 years. The most common symptoms according to Rome IV criteria were: straining (72%), hard stools (65%), spontaneous defecation less than three times a week (63%), and sensation of incomplete evacuation (56%).

Table 1. Evaluation of each question in OAB-V8 form before and after treatment

Variable	Before Treatment Mean \pm SD	After Treatment Mean \pm SD	p (t test)
Q ₁	4.18 \pm 1.11	2.45 \pm 1.44	<0.001*
Q ₂	3.14 \pm 1.23	1.87 \pm 1.23	0.004
Q ₃	3.32 \pm 1.34	1.63 \pm 1.28	<0.001*
Q ₄	2.89 \pm 1.65	1.94 \pm 1.54	0.002
Q ₅	3.27 \pm 1.14	2.63 \pm 0.98	0.002
Q ₆	3.76 \pm 1.09	2.17 \pm 1.12	<0.001*
Q ₇	3.01 \pm 1.57	1.69 \pm 1.59	0.002
Q ₈	2.73 \pm 1.98	1.58 \pm 1.39	0.005
Q _{Total Score}	25.21 \pm 6.16	14,81 \pm 5,93	<0.001*

Q: Question of OAB-V8

* The results were evaluated at 95% confidence interval and $p < 0.01$ significance level

Mean OAB-V8 scores before and after the treatment of constipation were 25.21 ± 6.16 and 14.81 ± 5.93 , respectively. The difference between the mean OAB-V8 scores before and after the treatment of constipation in the study population was statistically significant ($p < 0.001$) (Table 1).

After FC treatment, without the treatment of OAB, the total OAB-V8 score decreased below the level of the cut-off value for the diagnosis of OAB in 13 (24%) of 54 patients. In 36 (67%) patients, total OAB-V8 score was sufficient for the diagnosis of OAB, but the symptoms regressed significantly. In 5 (9%) patients, OAB symptoms did not resolve although the treatment of FC was accomplished.

In Table 1, OAB-V8 scores before and after treatments are shown. Scores of all questions decreased with treatment. However, statistically significant decrease was observed in only 1st, 3rd, and 6th questions (frequency, urgency, nocturia) ($p < 0.001$).

Data of 13 patients, in whom the total OAB-V8 score decreased below the level of the sensitivity and specificity score for the diagnosis of OAB after FC treatment alone, were assessed separately. Mean age of these patients was 70.76 ± 6.08 . The most common symptoms according to Rome IV criteria were straining (69%), sensation of incomplete evacuation (69%), and manual maneuvers to facilitate defecation (pressure on pelvis floor, digital evacuation) (54%). In this group, statistically significant difference in OAB-V8 scores before and after FC treatment was observed in 5th question (quality of life) in addition to 1st, 3rd, and 6th questions.

DISCUSSION

Association of FC with OAB was demonstrated in previous studies (5,9,10). Erickson and colleagues reported complete resolution of urination symptoms with polyethylene glycol 3350 treatment in 44 of 45 patients with FC diagnosis (11). Another study showed recovery by means of changes in urination, defecation, and nutrition habits in 68% of 50 patients with bowel-bladder dysfunction (12). In a series in 2011, constipation was encountered in 25 of 40 children with urgency, frequency, and incontinence symptoms and OAB symptoms were regressed substantially with the constipation treatment (13). Hereby, treatment strategies of the patients who have OAB symptoms should be different according as they have FC or not.

These studies, which investigated OAB after FC treatment, are related with the pediatric population. In adults, FC is more common in women, the elderly and low-income individuals, and may have negative repercussions on quality of life due to frequent need for repeated treatments (14). In a review, which included also adult patients, investigation of the constipation causes and informing the patients about constipation preventing diet were reported to be beneficial in the treatment of the urinary incontinence (15). However, to the best of our knowledge,

there is not a prospective study investigating the effects of FC treatment on OAB by using internationally validated objective questionnaires in adults in the English literature.

Different questionnaires and criteria for OAB and FC might lead to different results; therefore the questionnaires and definitions we used in our study are well established. After FC treatment alone, in 24% of patients OAB-V8 score decreased below the cut-off level without administrating β 3-adrenoreceptor agonists, antimuscarinics or any other drugs. Although additional treatment was needed for OAB in 67% of patients, OAB-V8 score was decreased significantly. Our study reveals that treatment of FC in female patients with OAB has a positive effect on the resolution of OAB symptoms.

A urodynamic study by De Wachter et al. showed that rectal distention significantly influences the sensation of bladder filling, while Panayi et al. detected detrusor overactivity when the rectum was distended and not when it was empty (3,16). In our patient group, substantial regression of frequency, urgency, and nocturia symptoms after FC treatment support these studies. Antimuscarinics, which decrease bowel motility, may worsen frequency, urgency, and nocturia symptoms in patients with FC. In these patients, after treating FC, if OAB persists, β 3-adrenoreceptor agonists or transdermal antimuscarinics, which have minimal adverse effects on bowel motility compared with oral antimuscarinics, should be used (17,18).

FC should be investigated in patients with OAB especially above 70 years of age. Gastroenterology counseling is essential in patients who have sensation of incomplete evacuation or need manual maneuvers to facilitate defecation. It should be born in mind that in these patients OAB symptoms may considerably regress with FC treatment alone, before any medication for OAB.

There are some limitations of our study. First, the mass of the patients refused to take part in the study because of several reasons, although FC and OAB co-occurrence is encountered more frequently in our clinic. Thus, in three years, only 54 patients, who met our criteria, could be included in the study. Second, other OAB questionnaires and quality of life forms, except OAB-V8, was not used in our study.

CONCLUSION

As in the pediatric population; OAB and FC are common clinical problems in middle-aged and elderly women. Treatment of FC at the beginning might resolve frequency, urgency, and nocturia symptoms in these patients substantially. OAB symptoms may considerably regress with FC treatment alone, especially in patients older than 70 years.

Competing interests: The authors declare that they have no competing interest.

Financial Disclosure: There are no financial supports.

Ethical approval: A total of 417 patients diagnosed with OAB and FC in our clinic between June 2016 and June 2019 were prospectively evaluated. Institutional review board (IRB) approval was acquired from our University Ethics Committee.

Serkan Akan ORCID: 0000-0002-6066-0401

Omer Yilmaz ORCID: 0000-0002-4433-9431

Caner Ediz ORCID: 0000-0001-9717-1209

Serkan Yenigurbuz ORCID: 0000-0002-4862-2103

Cumhur Yesildal ORCID: 0000-0002-1518-8371

REFERENCES

1. Abrams P, Cardozo L, Fall M, et al. The standardization of terminology in lower urinary tract function: report from the standardization sub-committee of the International Continence Society. *Urology* 2003;61:37-49.
2. Christianson JA, Liang R, Ustinova EE, et al. Convergence of bladder and colon sensory innervation occurs at the primary afferent level. *Pain* 2007;128:235-43.
3. Panayi DC, Khullar V, Digesu GA, et al. Rectal distension: the effect on bladder function. *Neurourol Urodyn*. 2011;30:344-7.
4. Malykhina AP. Neural mechanisms of pelvic organ cross sensitization. *Neuroscience* 2007;149:660-72.
5. Maeda T, Tomita M, Nakazawa A, et al. Female functional constipation is associated with overactive bladder symptoms and urinary incontinence. *Biomed Res Int* 2017;2017:2138073.
6. Acquadro C, Kopp Z, Coyne KS, et al. Translating overactive bladder questionnaires in 14 languages. *Urology* 2006;67:536.
7. Tarcan T, Mangır N, Özgür MO, ve ark. OAB-V8 Aşırı Aktif Mesane Sorgulama Formu Validasyon Çalışması. *Üroloji Bülteni* 2012;21:113-6.
8. Lacy BE, Mearin F, Chang L, et al. Bowel disorders. *Gastroenterology* 2016;150:1393-407.
9. Sampaio C, Sousa AS, Fraga LG, et al. Constipation and lower urinary tract dysfunction in children and adolescents: a population-based study. *Front Pediatr* 2016;4:101.
10. Abreu GE, Dourado ER, Alves DN, et al. Functional constipation and overactive bladder in women: a population-based study. *Arq Gastroenterol* 2018;55:35-40.
11. Erickson BA. Polyethylene glycol 3350 for constipation in children with dysfunctional elimination. *J Urol* 2003;170:1518-20.
12. Thom M, Campigotto M, Vemulakonda V, et al. Management of lower urinary tract dysfunction: a stepwise approach. *J Pediatr Urol* 2012;8:20-4.
13. Kim JH, Lee JH, Jung AY, et al. The prevalence and therapeutic effect of constipation in pediatric overactive bladder. *Int Neurourol J* 2011;15:206-10.
14. Mugie SM, Benninga MA, Di Lorenzo C. Epidemiology of constipation in children and adults: a systematic review. *Best Pract Res Clin Gastroenterol*. 2011;25:3-18.
15. Nurko S, Scott SM. Coexistence of constipation and incontinence in children and adults. *Best Practice & Research Clinical Gastroenterology* 2011;25:29-41.
16. De Wachter S, De Jong A, Van Dyck J, et al. Interaction of filling related sensation between anorectum and lower urinary tract and its impact on the sequence of their evacuation. A study in healthy volunteers. *Neurourol Urodyn* 2007;26:481-5.
17. Maman K, Aballea S, Nazir J, et al. Comparative efficacy and safety of medical treatments for the management of overactive bladder: a systematic literature review and mixed treatment comparison. *Eur Urol* 2014;65:755-65.
18. Sand PK. The evolution of transdermal therapy for overactive bladder. *Curr Urol Rep* 2009;10:338-41.