

Systematic Review: The Role of Pelvic Floor Muscles Dysfunction in Constipation

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ABSTRACT

Purpose: Pelvic floor muscle dysfunction is a common cause of constipation. This dysfunction does not respond to current treatments of constipation. Thus, it is important to identify this type of dysfunction and the role of these muscles in constipation. The purpose of the present study was to review the previously published studies concerning the role of pelvic floor muscles dysfunction in constipation and related assessment methods.

Methods: Articles were obtained by searching in several databases including, Elsevier, Science Direct, ProQuest, Google scholar, and PubMed. The keywords that were used were 'constipation,' 'functional constipation,' and 'pelvic floor dysfunction.' Inclusion criteria included articles that were published in English from 1980 to 2013. A total of 100 articles were obtained using the mentioned keywords that among them articles about constipation, its definition, types, methods of assessment, and diagnosis were reviewed. Of these articles, 12 articles were related to the assessment procedures and pelvic floor muscle function in constipation.

Results: The overall outcome of the studies provided sufficient evidence indicating the role of pelvic floor muscle dysfunction in constipation.

Conclusion: Therefore, attention to this cause is effective in recovery process of these patients. There isn't agreement to better assessment method. It seems that manometry is a good way in the medical field and palpation as an acceptable procedure can be used in rehabilitation field.

1. Introduction

Constipation is a common symptom reported in functional bowel disorders, which can reduce the number of normal defecations [4]. Although most people have bowel movements at least 3 times a week, nonrecurrent defecation is unusual among people with constipation. The majority of patients with constipation have reported symptoms such as straining or hard stools. Severe constipation (bowel movement 2 times a month) occurs more in women [9]. People with constipation suf-

fer from symptoms such as loss of bowel movements, bloating, failure to evacuate, and painful evacuation for weeks. Studies show that constipation affect 2%-34% of adults in studied populations [24]. Although the prevalence of constipation has been reported up to 34%, it seems that the true prevalence of complication is more. In other words, approximately 65% of people who suffer from constipation do self-medication, use laxatives, and do not seek specialized medical treatments [7].

In Iran, the overall prevalence of functional bowel disorders among patients that referred to Gastrointes-

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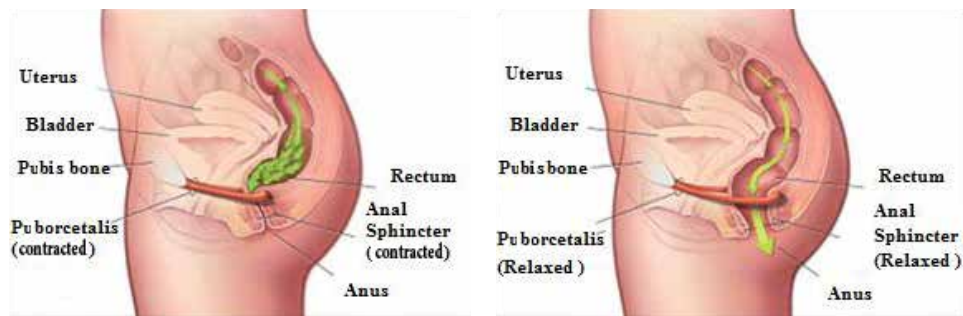


Figure 1. Relaxation of pelvic floor muscles during defecation

PHYSICAL TREATMENTS

tinal Disease clinics has been reported at 40.1% [8]. This disorder becomes chronic in one quarter of cases, sometimes severe, and occasionally debilitating, and impact the peoples' quality of life. Many patients take self-medication, and seek treatment, when the disease has become chronic and their self-treatments get unsatisfactory over the time [24]. Patients typically use laxatives to reduce the symptoms. Reduction of laxative consumption decreases its side effects such as incontinence, lack of water, hypercalcaemia, and magnesium poisoning and also decreases the costs that imposed to individual and community health system [26]. Constipation can cause many complications and create numerous problems. These complications are described in the following paragraphs.

Chronic straining will result in trauma, which usually affects anterior rectal wall (rectal ulcer syndrome) [12]. After a while, this stress may cause fissures, hemorrhoids, rectocele, rectal ulcers, and in complicated cases susceptibility to sphincter damage and anal incontinence. The affected people have painful excretion that often makes them feel stressed. Too much stress, adds to their problem and this vicious cycle continues. Excessive Descending Perineum Syndrome (DPS) that is due to severe and frequent strain can lead to rectal prolaps. Ultimately pelvic floor tension related to excessive descending can cause damage to sacral nerve, which leads to reduction in rectal sense and fecal incontinence [3].

Chronic constipation can be divided into two primary (functional) and secondary groups. Primary (Functional) constipation is divided into 3 groups: normal transmission or irritable bowel syndrome (59%), slow transit (13%), and the pelvic floor muscles dysfunction (functional bowel disease) (25%) [21]. Many patients may be categorized in more than one group [6]. Secondary constipation occurs due to medical illness or drug use. Secondary causes of constipation comprise mechanical causes (cancer of the rectum and large intestine), endocrine or metabolic causes (overactive thyroid, diabetes,

hypercalcaemia, uremia), neurological disorders (MS, Parkinson), drugs (opioids, anti-depression), and systemic (lupus, scleroderma) [6].

Role of the pelvic floor muscles in constipation was introduced for the first time in 1978 by Martelli [18]. Constipation due to pelvic floor muscle disorder and the impact of chronic straining at excretion onto other pelvic structures was unclear until 1980. Physiological and clinical studies conducted in 1980s and 1990s provided a solution to these problems [17]. Preston and Lenard-Jones described constipation for the first time as a pelvic floor muscle dysfunction. They showed that a subgroup of patients with constipation have problems when they want to relax their pelvic floor muscles during excretion and inversely contract these muscles. The other researchers supported their observations [23].

The prevalence of this type of constipation is not well known but it is estimated that 25%-50% of chronic constipation is in this category, which shows how common the pelvic floor disorders is [25]. For excretion, the external sphincter and puborectalis muscles should be relaxed. With the relaxation of the puborectalis, the anorectal angle opens and feces gets out. Intra-abdominal pressure and then the Valsalva maneuver were used to push out feces (Figure 1). If these actions fail or get uncoordinated, the obstruction in excretion may happen. According to the outlined steps, pelvic floor muscle dysfunction can affect the proper excretion and will lead to functional constipation. The symptoms that may indicate dysfunction in the pelvic floor muscles in constipation include inability to empty the rectum, a sense of rectal fullness, rectal pain, get help from hand to put pressure onto the posterior vaginal wall or perineum for inducing bowel movements [7].

Many clinical methods have been suggested for evaluating the performance of pelvic floor muscles in constipation. These methods comprise history taking, palpation, colonic transit time (CTT), anorectal manometry,

balloon expulsion, defecography, electromyography (EMG), etc. Despite the evidence that showed a dysfunction in pelvic floor muscle function in high percentage of patients with chronic constipation, sometimes the diagnosis and treatment are not done properly. Patients with constipation are trying to solve their problem with laxatives that not only do not solve the problem, but also confront them with the side effects of drugs.

Therefore, proper diagnosis and treatment of this disorder return them to their normal path of life, improve their mental health, and save their time and budget (also for the health service). Despite the important role of the muscles of the pelvic floor in the act of excretion and constipation, a favorable study on the role of these muscles in functional constipation was not carried out and assessment methods of this disorder were not considered comprehensively. The purpose of this study was to review the literature about the role of pelvic floor muscle dysfunction in constipation and also its evaluation methods.

2. Materials & Methods

Articles were obtained by searching in several databases including, Elsevier, Science Direct, ProQuest, Google scholar, and PubMed. The keywords that were used were 'constipation,' 'functional constipation,' and 'Pelvic floor dysfunction.' Initially titles of the articles and relevant abstracts were reviewed at a later stage and then among abstract databases, full-text articles were studied.

Studies were selected with the following criteria: (1) Studies that examine constipation, its definition and types, methods of assessment and diagnosis; (2) Studies were published in English from 1980 to 2013. (3) Studies were published in English; (4) Studies were available in full text.

3. Results

A total of 100 articles were obtained using the mentioned keywords that among them articles about constipation, definition, types, methods of assessment and diagnosis were collected. Out of them, 50 articles were used for investigating the role of pelvic floor muscle dysfunction in constipation. Finally, 12 articles were related to assessment procedures and pelvic floor muscle function in constipation that were evaluated. Summary of these articles are shown in Table 1.

Wald (2006), Bharucha (2007), Verne and woffard (2002), Kumar and Davis (2005), Brusciaru (2007), Kalbom et al (2005), Lewicky et al (2007), Lee et al (2003), Keate and Shapiro (2002), and Tantiphalachiva et al (2010) have focused on defined functional constipation and impaired pelvic floor muscles [1, 5, 10, 13, 15, 22, 27]. Some studies have focused on the evaluation of anorectal problems and what method represents the pelvic floor muscle dysfunction that are shown in Table 1 [1, 2, 4, 5, 10, 11, 13, 14, 15, 16, 20, 22]. Studies which are shown in Table 1 were different in terms of number, type of samples, methods of studied indexes, and their procedure implementation.

Studies that used different methods of evaluation to show pelvic floor muscle problems in anorectal disorders are in the following paragraphs.

In investigated studies, two studies used manometry method to demonstrate the dysfunction of pelvic floor muscles. For example, Jones and colleagues [4] (by using manometry method) found that 76% of people with chronic constipation, 48% of people with idiopathic pain in perineum, and 50% of patients with rectal ulcers have asymmetric contraction in puborectalis muscle (pelvic floor muscle dysfunction).

Nauhaus and colleagues [1] have reported this disorder in 68% of patients with chronic constipation, 25.5% of patients with fecal incontinence, and 1.22% of healthy individuals. In some studies such as Rao and colleagues [10, 16], and Lohsiriwat [11], using the manometry method was confirmed in detecting anorectal problems compared to other methods.

Minguez and his colleagues [2] selected two known groups of functional constipation with and without pelvic floor muscles dysfunction and compared them with respect to the balloon expulsion. The results of this study showed that the balloon test was a simple and useful test to identify patients with constipation caused by pelvic floor muscle dysfunction.

Karbolm and his colleagues [15] evaluated the asymmetric contraction of sphincter by means of force/pressure electromyography index in patients with constipation. Aim of this study was determination of the quality of function in puborectalis muscle and the anal external sphincter during straining and pressing to get force/pressure index and evaluation of the needle location (anal external sphincter or puborectalis muscle) as well as patients' position. This study showed that there is a possibility to use electromyography as a method

Table 1. Studies were related to assessment procedures.

Reference	Year	Method	Groups	Result
Jones et al. [4]	1987	Manometry	1- Chronic constipation 2- Idiopathic pain in the perineum 3- Rectal ulcer	PFD } 76% 48% 50%
Nauhaus et al. [1]	1997	Manometry	1- Chronic constipation 2- Fecal incontinence 3- Healthy people	PFD } 68% 25.5% 22.1%
Rao et al. [10, 16]	1999 2001	Manometry	45 Healthy people	The suitability of Manometry in anorectal problems
Prokesch et al. [19]	1999	Colonic transit time(CTT) Defecography	30 patients with constipation	Use of CTT before the defecography is helpful
Hallan et al. [5]	2000	Rectum digital assessment Manometry	66 patients	A high correlation was observed between the two methods of digital assessment and Manometry
Shapiro et al. [13]	2002	Manometry Balloon expulsion	149 patients with pelvic floor muscle dysfunction	Balloon expulsion is incompetent to identify all groups of dysfunction and it complemented with Manometry
Lohsidiwat et al. [11]	2004	Manometry	30 Healthy people	The suitability of Manometry in anorectal problems
Mingues et al. [2]	2004	Balloon expulsion	106 patients with constipation without pelvic floor muscle dysfunction 24 patients with pelvic floor muscle dysfunction	Balloon expulsion is a simple and useful test for identifying dysfunction.
Karbolm et al. [15]	2005	Electromyography	194 patients 16 controls	There is a possibility of using EMG as a method for paradoxical contraction of puborectalis
Lang et al. [20]	2007	Rectum digital assessment Manometry	57 women with pelvic floor muscle dysfunction	There was a little correlation between the two methods.

PHYSICAL TREATMENTS

for asymmetric contraction of puborectalis. The results showed that the force/pressure index of more than 50 may be clinically useful and can help in selecting patients for intervention of biofeedback.

Rao and colleagues [22] selected the palpation assessment method to show pelvic floor muscles dysfunction in patients with chronic constipation. Their study

showed that an accurate palpation evaluation has high efficiency to demonstrate pelvic floor muscle dysfunction in patients with chronic constipation. This assessment was able to identify 73% of patients who had standard diagnostic criteria for this disorder. They stated that, a digital assessment is a suitable prognostic tool for this type of constipation and therefore may facilitate the selection of appropriate patients for testing in the future.

Digital assessment can also differentiate the normal anal resting pressure, increased, and decreased pressure.

The studies that compared different assessment methods were as follows:

Hallan and colleagues [5] compared two manometry and digital assessment methods. They found high correlation between results of these two methods.

Similarly Rao and colleagues [22] stated that there was a good association between digital assessment and manometry in patients with pelvic floor muscle dysfunction.

In contrast, Lang and colleagues [20] have expressed a low correlation between these two assessment methods.

Shapiro and colleagues [13], in a retrospective study investigated the anal manometry in 149 patients from 1998 to 2001 who were admitted to a medical center and compared anal manometry with balloon expulsion. The results of this study showed that balloon expulsion alone is incompetent to identify all groups of pelvic floor dysfunction and should be completed by the manometry excretion index. Prokesch and colleagues [19] conducted the evaluation of chronic constipation with colonic transit time and compared that with defecography.

In this study they asked that, if it was possible to distinguish the transit time and defecography between the functional constipation and anorectal diseases. Transit in muscle spasms of the pelvic floor was high in rectosigmoid part. In fact, in spastic group, most stool stays in the rectosigmoid. The results showed that the use of transit to separate the groups is helpful even before defecography.

The review of previous studies indicates that there are sufficient reasons for pelvic floor muscles dysfunction in constipation and pay more attention to these patients are effective in their recovery.

Limitation

One of the limitations in the current review, articles were concluded in the review that a full report published in the English language. Although this limitation is common in systematic reviews, the possibility of a language bias should be considered.

4. Discussion

During excretion, stool comes out from rectal, via relaxed pelvic floor and anal sphincter. With the relaxation of these muscles, the anorectal angle opens. If these muscles do not relax properly, individuals cannot evacuate and constipation symptoms appear. Pelvic floor dysfunction is very important cause in constipation. Also, studies have shown that the assessment and diagnosis of these patients are very important, which the first line of treatment for these patients. The diagnosis of this disorder could be accomplished by history taking, palpation, manometry, balloon expulsion, colonic transit time, defecography, and EMG.

Every year, a lot of people are referred to health centers due to chronic constipation and treated with administration of drugs and nutritional regimes but some cases of chronic constipation such as functional constipation due to pelvic floor muscle dysfunction do not response to these treatments and exposed with serious problems.

Therefore, a careful examination of the patients with chronic constipation and taking full history and diagnosis of the main causes of constipation are very important and with the provision of appropriate and effective treatment of the patient, the additional costs and spending extra time incurred by the individual and centers are prevented. There is no general agreement on the best way of evaluating the clinical performance of these muscles. It seems that manometry is a good method in medical field and palpation can be used as an acceptable procedure in rehabilitation field.

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