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RESEARCH ARTICLE

STUDY OF THE ROLE OF DYNAMIC PELVIC MRI DEFECOGRAPHY IN EVALUATION OF PATIENTS WITH CHRONIC CONSTIPATION

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ABSTRACT

Background: Patients with obstructed defecation syndrome (ODS) form an important subset of patients with chronic constipation. Evaluation of these patients has traditionally been difficult. Magnetic resonance defecography (MRD) is a very useful tool for the evaluation of these patients.
Patients and Methods: 30 patients with chronic idiopathic constipation (according to Rome III) wereselected, (17 males, 13 females) with mean age 37 years.Conventional clinical diagnosis, Ileo-colonoscopy and laboratory investigation focus on excluding all potential organic causes of patient symptoms, Agachan constipation score questionnaire were completed and Dynamic MRI defecography was performed. The different pelvic floor morphology was recorded.
Results: The dynamic pelvic MRI defecography showed 26 patients with pelvic floor descent, 14 Rectal prolapse,17 anterior rectocele , 8peritoneocele , 4 uterine prolapse, and 3 dyskinetic puborectalis muscle and the mean value of total Agachan score was 16.
Conclusions: Magnetic resonance defecography is an effective method for evaluation of pelvic floor weakness and anorectal dysfunction. With no ionizing radiation, less than 30 minutes of imaging, and complete anatomic and functional details.

INTRODUCTION

Constipation is one of the most common chronic gastro-intestinal disorders in adults (Drossman *et al.,* 1993, Higgins and Johanson 2004).Chronic constipation leads to approximately 2.5 million visits to the physicians in the United States annually (Stewart *et al.,* 1999). Traditionally, physicians have defined constipation as three or fewer bowel movements per week. Having fewer bowel movements is associated with symptoms of lower abdominal discomfort, distension, or bloating(Johanson *et al.,* 1989). However, patients tend to define constipation differently than physicians, and describe it in a variety of ways. In a self-reported survey of 1,028 young adults, 52 percent defined constipation as straining, 44% as hard stools, 32% as infrequent stools, and 20% as abdominal discomfort (Sandler and Drossman 1987). The Rome III diagnostic criteria are widely used in research and provide a more complete and reproducible definition of functional constipation (Table 1) (Longstreth *et al.,* 2006).

Risk factors

Risk factors for constipation include female sex, older age(McCrea *et al.,* 2009). inactivity, low caloric intake, low-fiber diet (Rao 2007), taking a large number of medications (Talley *et al.,* 2003), low income, and low educational level (McCrea *et al.,* 2009, Talley *et al.,* 2003) Constipation is 1.3 times more likely to occur in nonwhites than in whites, and is considerably more common in families of low socioeconomic status.(Gleeson1972)

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Types of constipation

International panel of experts have classified constipation into Functional Constipation, Irritable Bowel Syndrome–Constipation (IBS-C)and Symptoms of constipation may be secondary to obstructing lesion in the colon, metabolic disturbances, neurologic disorders and drug induced constipation (Table 2). (Bharucha *et al.,* 2006, Jamshed *et al.,* 2011). Functional Constipation has been described as a "functionalbowel disorder that presents as persistently difficult, infrequent, or seemingly incomplete defecation, which do not meet IBS criteria," with less than three bowel movements per week. Diagnostic criteria for Functional Constipation according to the Rome III guidelines are shown in Table 1. Functional constipation is further classified into normal transit constipation, slow transit constipation and functional defecation disorders (outlet obstruction) (Longstreth *et al.,* 2006, Bharucha *et al.,* 2006).

Defecation disorders

Defecation disorders are primarily characterized by impaired rectal evacuation from inadequate rectal propulsive forces and/or increased resistance to evacuation; the latter may result from paradoxical contraction of the pelvic floor and external anal sphincters ("anismus") during defecation. And also Structural disturbances (e.g., rectocele, rectal prolapsed, pelvic floor descent, enterocele) can be the cause of this

condition.(Bharucha *et al.,* 2013, Rao *et al.,* 1998). Functional defecation disorders are further classified into two categories:a. Dys-synergic defecation (paradoxical contraction or inadequate relaxation of the pelvic floor muscles during attempted defecation), and b. Inadequate defecation propulsion (inadequate propulsive forces during attempted defecation).

Table 1. Rome III Diagnostic Criteria for Functional Constipation (Longstreth *et al.,* 2006)

1) Must include two or more of the following:
   -Straining during at least 25 percent of defecations
   -Lumpy or hard stools in at least 25 percent of defecations
   -Sensation of incomplete evacuation for at least 25 percent of defecations
   -Sensation of anorectal obstruction/blockage for at least 25 percent of defecations
   -Manual maneuvers to facilitate at least 25 percent of defecations (e.g., digital evacuation, support of the pelvic floor)
   -Fewer than three defecations per week
2) Loose stools are rarely present without the use of laxatives
3) There are insufficient criteria for irritable bowel syndrome

Note: Criteria must be fulfilled for the past three months, with symptom onset at least six months before diagnosis.

Table 2. Selected Causes of Secondary Constipation (Johanson *et al*. 1989, Jamshed *et al*., 2011)

Medications	Medical conditions
Antacids, especially with calcium	Cerebrovascular disease
Iron supplements	Depression
Opioids	Diabetes mellitus
Anticholinergic agents	Hypothyroidism
Antidiarrheal agents	Anal fissures
Antihistamines	Autonomic neuropathy
Antiparkinsonian agents	Cognitive impairment
Antipsychotics	Colon cancer
Calcium channel blockers	Hypercalcemia
Calcium supplements	Hypokalemia
Diuretics	Hypomagnesemia
Nonsteroidal anti-inflammatory drugs	Immobility
Sympathomimetics	Multiple sclerosis
Tricyclic antidepressants	Parkinson disease
	Spinal cord injury

Traditionally, conventional defecography or evacuation proctography has played an important role in the radiological assessment of these patients. Conventional defecographyallows for reliable assessment for a varietyof morphological and functional causes which are associated with outlet obstruction including rectal prolapse, and anismus. Although conventional defecography has its value in the diagnostic assessment, the technique has some signi cant limitations. There is a considerable irradiation associated with conventional evacuation proctography (Savoye-Collet *et al.,* 2010, Tsiaoussis *et al.,* 1998) Moreover, the techniqueis limited froma practical point of view by its projectional nature and its inability to detect soft tissue structures. Dynamic pelvic MR imaging allows for the evaluation of the pelvic oor in different positions. The free selection of imaging planes, the good temporal resolution, and the excellent soft-tissue contrast have transformed this method into the preferred imaging modality in the evaluation of patients with pelvic oor dysfunction (Parks *et al.,* 1966).

MATERIALS AND METHODS

The present study was carried out on 30 patients who were diagnosed as having chronic idiopathic constipation according to Rome III criteria. Patients with previous colonic surgery, previous spinal cord surgery, thyroid dysfunction, Diabetes, wereexcluded. Disorders of respiratory, cardiologic, renal, hepatic, previous colonic surgery, neurologic functions; other diseases that in the opinion of the investigator, could significantly affect intestinal transit were excluded. Also All patients were subjected to ileo-colonoscopy, C.T entero-colonographyto diagnose any contributing abnormality; patients with evidence of stricture, colonic tumor or polyp, inflammatory bowel disease were excluded.

Dynamic pelvic MRI defecography

MRI was performed on a 1.5 Tesla closed-configuration Phillips Gyros can system using abodyarray surface coil. The patients were positioned supine without tilting of the pelvis to either side. They flex their knees in order to simulate a sitting position, and hence Strain more easily and forcefully. Next we combined static anddynamic (functional) pulse sequences: Three-plane scout imageswere obtained to identify the pubic symphysis, urinary bladder, vagina, rectum, coccyx, sacrum, ischialspine, and ischial tuberosity.

Image analysis

All pelvic organs should be above the pubococcygeal line PCL (drawn from the inferior border of the symphysis pubis till the last coccygeal joint), seen inthe sagittal sequences both rest and dynamic.Pelvic floor descent was defined as excessive ballooning of the perineum below the bony outlet of the pelvis, it was classi ed into; normal = 0 up to 2, mild = 2 up to 3 cm, moderate = 3 to < 6 cm, severe = > 6 cm, uterine prolapse was de ned as descent of the uterus below PCL, Intussusception was de ned as invagination of the rectal wall either mucosa or full thickness into the rectal cavity, the degree of descent of uterine prolapse, intussusception was classi ed into; mild = 0 to < 2 cm, moderate = 2 to <4 cm, severe =>4 cm. Rectocele was de ned as out-pouching of the rectal wall beyond 2 cm away from a mid-anal canal line, it was classi ed into; mild = 2 to <4 cm, moderate = 4 to <6 cm, severe =>6 cm. Enterocele was de ned when the small bowel or mesentery descended >2 cm into the recto-vesical or recto-vaginal space or inferiorlyto the proximal one third of the vagina. Assessment of the muscles and ligaments of the pelvic oor including levator plate, puborectalis muscles, pubococcygeus muscle and vaginal septum as regard to signals of intensity and integrity, and perineal hiatus which is normally <5 cm in antro-posterior diameter and <4 cm in side to side diameter if these parameters increase this mean perineal ballooning.

Grading of constipation intensity

Grading of Constipation intensity was determined using the AgachanConstipation Scoring System, which considers at the same time the following set of symptoms: frequency of bowel movements, difficulty/straining to evacuate, pain on evacuation, sensation of incomplete evacuation, abdominal

pain, time taken to start the evacuation, type of assistance (digital assistance or enema) for evacuation, attempts per day and duration of constipation. The lower is the Agachan score; the lower is considered the constipation intensity. The intensity of each symptomwas scored from zero to four, except for "type of assistance for evacuation", which ranged from zero (without assistance) or two (with digital assistance or enema). The total Agachan score (sum of all scores obtained from each symptom). Agachan scores of 0-10, 11-20, and 21-30 were classified as mild, moderate, and severe, respectively (Agachan *et al.,* 1996, Waitzberg *et al.,* 2013)

RESULTS

17(56.7%) patients were males and 13 (43.3%) were females. Mean age was 37.20 ± 12.41 years (ranged 17-66 years), and the mean duration of constipation was 46.47 ± 42.40 months. Defecography in women showed pelvic floor descent, anterior rectocele in 12 (92.3%), peritoneocele in 7 (53.8%) and uterine prolapsed in 4 (31%). all were graded into mild, moderate and severe as shown in (Figure 1).

Defecography in men showed pelvic floor descent, rectal prolapse in 14 (82.4%), anterior rectocele in 5 (29.4%), peritoneocele in 1 (5.9%) and paradoxical puborectalis contraction in 3 (17.6%).all are graded also into mild,moderate and severe as shown in (figure 2).

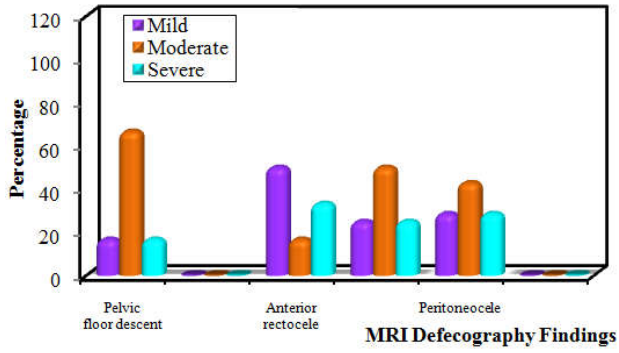

Figure 1. Distribution of the studied cases according to grading of MRI defecography findings in female

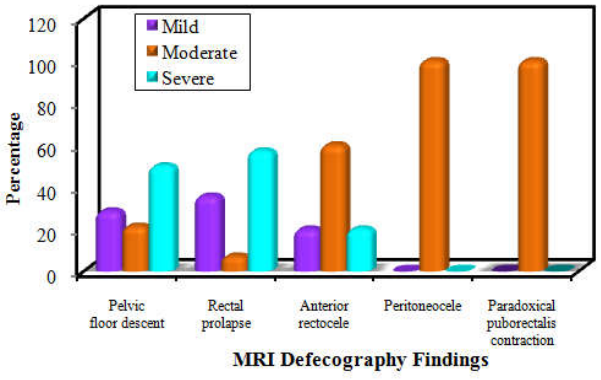

Figure 2. Distribution of the studied cases according to grading of MRI defecography findings in male

Regarding togender, There was a significant higher incidence of rectoceleand peritoneocelein females (p=0.001) (p=0.009), respectively. In addition there was a significant higher incidence of rectal prolapsed in males (p < 0.001). On the other hand, although There was a higher incidence of pelvic floor descent in female and puborectalis muscle in male but no statistical significant difference was reported between men and women regarding to pelvic floor descent and paradoxical puborectalis contraction (P=0.613) (p=0.238) , respectively.

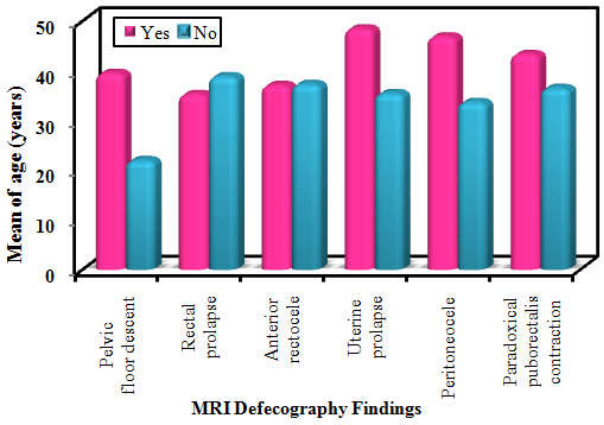

Figure 3. Relation between age (years) and MRI defecography findings

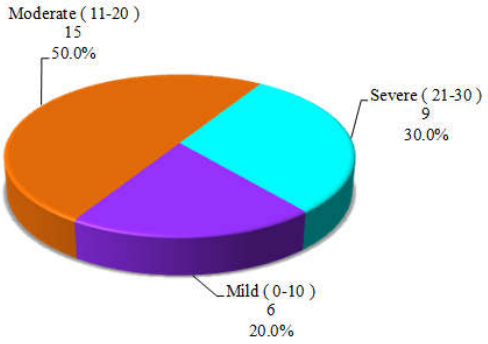

Figure 4. Distribution of the studied cases according to Total score

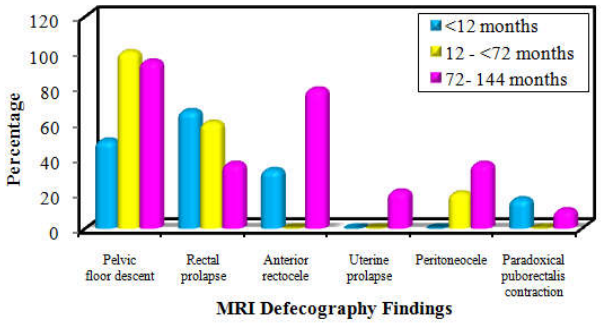

Figure 5. Relation between Duration of illness and MRI defecography findings

Pelvic floor descent mean age group (39.54±11.61) was significantly higher than mean age of non-affected group(22.0 ± 3.16), with (P=0.006) (Figure 3). Uterine prolapsed mean age group (48.50 ± 13.67) was significantly higher than mean age of non-affected group (35.46 ± 11.52), with (P=0.049) (Figure 3). Peritoneocele mean age group (46.88 ± 14.21) was significantly higher than mean age of non-affected group (33.68 ± 9.84), (P=0.008) (Figure 3). Anterior rectocele, rectal prolapsed and paradoxical puborectalis contraction showed no significant correlation to age. (Figure 3)

Table 3. Relation between Total score and MRI defecography findings

	Total score						χ^2	^{FE}p
	Mild (n = 6)		Moderate (n = 15)		Severe (n = 9)			
	No.	%	No.	%	No.	%		
Pelvic floor descent	4	66.7	14	93.3	8	88.9	2.555	0.292
Rectal prolapsed	3	50.0	6	40.0	5	55.6	0.700	0.888
Anterior rectocele	1	16.7	10	66.7	6	66.7	4.579	0.108
Uterine prolapse	1	16.7	1	6.7	2	22.2	1.615	0.508
Peritoneocele	1	16.7	5	33.3	2	22.2	0.692	0.759
Paradoxical puborectalis contraction	1	16.7	1	6.7	1	11.1	1.068	0.766

Regarding to duration of constipation it was found thatthe incidence of pelvic floor descent and anterior rectocele was significantly higher in patients with longer duration of constipation (P=0.031), (P=0.001), respectively. WhileRectal prolapsed, uterine prolapsed; enterocele and paradoxical puborectalis contraction didn't show any significant correlation to the duration of constipation, as Shown in (figure 5). Mean total Agachan score was 16, 6(20%) patients were mild with score ranged between 8-10 and mean ± SD 8.83 ± 0.98 while 15(50%) patients were moderate with score ranged between 12-19 and mean ± SD 15.47 ± 2.03 and 9(30%) patients were severe with score ranged between 21-22 and mean ± SD 21.33 ± 0.50. as shown in figure (4). There was no significant correlation between intensity of Agachanscore andMRI defecography findings, inspite of higher incidence of pelvic floor descent and anterior rectocele in moderate and severe patients, rectal prolapsed and uterine prolapse in severe patients. As shown in table (3). In addition, incidentally noted other findings by MRI defecography including cystocele (40%) and urethral hypermotility (33.3%) but these findings don't contribute to outlet constipation.

DISCUSSION

Constipation has plagued human beings since the beginning of time. Constipation is a problem for over 33 million adults in the United States and accounts for 2.5 million physician visits and 92,000 hospitalizations each year (Lembo and Camilleri 2003). Women are three times more likely than men to suffer from constipation and are more likely to have pelvic floor dysfunction (McCrea *et al.,* 2009).But inthis study there was a higher incidence in males than females. Studies showed that incidence of constipation increase by age (Pare *et al.,* 2001, Marfil *et al.,* 2005). The reason of this increase is probably the decrease in motility. But in this study the mean age of the patients was 36.9 years. Dynamic pelvic MRI defecography was first described by Yang *et al.,*.(Yang *et al.,* 1991) in 1991 who suggested dynamic MRI as a less invasive imaging modality that provided pelvic visceral and muscular anatomy at rest and with strain. Descending perineum syndrome was the most frequent problem in the present study.

The current study reported a higher incidence of the perineal descent in female than in male with no statistical significant difference, in agreement with the current study, Savoye *et al.,* (Savoye-Collet *et al.,* 2010)reported thatthere was no difference between men and women for the diagnosis of perineal descent at straining. On the other hand, Andrade *et al.,* reported that the distance between the PCL and the anorectal junction was significantly different between men and women. Other authors explained the higher incidence of PD in females than males that may be due to the injury of innervation of pelvic floor which can occur from a variety of insults such as multi-parity, childbirth, menopause, perineal trauma, and surgical procedures (Broekhuis *et al.,* 2010, Ryhammer *et al.,* 1996, Jorge *et al.,* 1993). The current study reported that mean age was significantly higher in perineal descent patients than the mean age of non affected group,in agreement with several studies, Andrade *et al.,* andAlves *et al.,* (Alves-Ferreira *et al.,* 2012).

This could be explained by the fact that in younger age the position of the pelvic floor is higher at rest with greater descent on evacuation, whereas the opposite applies in the elderly with more descent at rest already and less change on evacuation, therefore the results suggest that PD may be a consequence associated with aging or physiological phenomena rather than an independent disease(Pinho *et al.,* 1990).The current study reported a positive correlation between PD and duration of constipation. Tslaoussis *et al.,* 1998(Tslaoussis *et al.,* 1998)reported a significant correlation was found between the duration of symptoms and the length of PD at straining. Similar abnormalities in the control group were significantly less common and less severe. Also, Parks *et al.,* 1966(Parks *et al.,* 1966) andBoulay *et al.,* 1983(Du-Boulay *et al.,* 1983) reported the same results, and this could be explained by chronic straining during defecation has been attributed to injury of the sacral or pudendal nerves, damage to the intrinsic musculature leading to relaxation of pelvic floor.

In the present study, the incidence of anterior rectocele during dynamic MRIwas 17/30 patients (56.7%). Elshazly *et al.,* (Elshazly *et al.,*2010)observed it in 32/40 (80%) of their patients , Rentsch *et al.,*(Rentsch *et al.,* 2001)detected in 10/20(50%). The current study reported that anterior rectocele was significantly higher among females than males. Most of studies concerned with patients complaining of rectocele showed that this condition affects females mainly to the extent that many of those studies (Dietz and Clarke(Dietz and Clarke 2005) , Carter and Gabel(Carter and Gabel 2012)) included samples of patients that consisted only of females. This could be explained by laxity of the rectovaginal septum, usually caused by obstetrical trauma or surgical procedures. In fact, studies report that it is present in 78-99% of women who have given birth (Kenton *et al.,* 1999), while there was no significant correlation with the age.

The current study reported a significant positive correlation between recocele and duration of constipation. Dietz (Dietz 2009)who reported in his study that the more symptoms of obstructed defecation were reported by a patient, the more likely was a true rectocele, especially when chronicity of constipation was omitted from the analysis, the assumption is that chronicity of the constipation will create a firm stool and will require straining at stool, which will progressively enlarge

a rectocele and fill it with rectal contents, making the patient strain more in a vicious circle, leading to the sensation of incomplete emptying. In the present study, the incidence of rectal prolapse during dynamic MRI was 14/30 patients (46.7%). In general the rectal prolapse has a frequency of between 12% and 27% in patients with pelvic floor disorders. (Kelvin *et al.,* 1992), Elshazly *et al.,*(Elshazly *et al.,*2010)observed rectal prolapse in 18/40 (45%) of their patients, which is similar to our report.

As regard to demographic data and rectal prolapse, the present work showed that rectal prolapsed is significantly higher in men 14/17(82.4%) thanwomen, and no significant correlation between age and rectal prolapse. In concordance with the present study, an Egyptian studydone by Kosba *et al.,* (Kosba, 2007 #436) reported that rectal prolapse in male patients represented (88 %) and in female represented (12 %). R. Hausammann *et al.,* (Hausammann *et al.,* 2009)reported that there was no significant correlation between age and internal rectal prolapse grades (p=0.089), anotherstudy Savoye *et al.,* 2010 reported that internal rectal prolapse is very common in both sexes. MRDefecography in men showed 38 patients (57.6%), and in women showed 89 patients (44.9%), (approximately half of patients undergoing defecography) and did not observe any sex difference in prevalence.On the contrary, epidemiological aspects emphasize the low incidence of rectal prolapse in men(10%) vs women(90%), Boccasanta *et al.,* (Boccasanta *et al.,* 1999) reported that women represented more than 80% of their patients with complete rectal prolapse with a mean age of 68.9 years, also Zbar *et al.,* (Zbar *et al.,* 2002) reported a female incidence of 75% of their patients with a mean age of 69.3 years. Additionally, a Scandinavian studyDyrberg *et al.,* (Dyrberg *et al.,* 2015)reported that male: female ratio 4:77 with mean age 73 years, also, another Scandinavian study Kairaluoma and Kellokumpu(Kairaluoma and Kellokumpu 2005)reported ten men (10 percent) and 89 women (90 percent). Mean age of the patients was 69 (range, 21-91) years showing that rectal prolapse is largely confined to female patients. Previous studies also found rectal prolapse to be more common in patients over 50 years of age, 87% of patients being over fifty years old (Keighley *et al.,* 1992).

This discrepancy may be explained by the high incidence of schistosomiasis in young Egyptian male patients as a result of continual exposure to infection while cultivating the fields with Nile water which is infected with Schistosoma hematobium resulting in Schistosoma myopathy of pelvic floor muscle which contributes to rectal prolapse. The current study reported no significant correlation between rectal prolapsed and duration of constipation. Dvorkin *et al.,* (Dvorkin *et al.,* 2005) reported that in the symptomatic group there was no association between duration of symptoms and morphology of rectal prolapse. Peritoneocele is the herniation of the cul-de-sac that usually contains small bowel (enterocele).(Fenner 1996)The current study reported that peritoneocele was significantly higher in female than in male, and the mean age group of peritoneocele patients was significantly higher than the mean age of non-affected group. In various studies done by multiple authors which concerned with patients complaining of enterocele showed that this condition affects females mainly to the extent that many of those studies (Lapalus *et al.,* (Lapalus *et al.,* 2004),Oom *et al.,*(Oom *et al.,* 2007), Chou *et al.,*(Chou *et al.,* 2000)) included patient samples that consisted only of females. Similarly,Jarrett *et al.,*(Jarrett *et al.,* 2010)showed an enterocele was present in 125 ⁄ 322 women (39%) and 5 ⁄ 49 men (10%). The higher rate in women was statistically significant and there was a higher likelihood of having an enterocele with advancing age. In concordance with the current study, Savoye *et al.,* (Savoye-Collet *et al.,* 2010) showed enterocele in men 7 (10.6%), while in women 59 (29.8%), with a significant higher proportion of enterocele in women (Lapalus *et al.,* 2004), this could be explained by obstetrical anteriority (vaginal delivery or hysterectomy).

The consequences of obstetric damage on the perineum are well known (Sultan *et al.,* 1993, Kamm 1994). Additionally, Regadas *et al.,*(Murad-Regadas *et al.,* 2012) reported that the incidence of significant enterocele/sigmoidocele was found to increase with age (p/0.0431) and proved that by stratifying patients into decades (21-30, 31-40, 41-50, 51-60, 61-70, 71-80,and over 80 years). On the other hand, a French studyLapalus *et al.,*(Lapalus *et al.,* 2004)that aimed to study clinical risk factors of enterocele, reported that there were no significant differences in age, and that may be due to small patient sample included in the study compared with the large control sample (136 women with enterocele were compared to 408 women without enterocele). The current study reported no significant correlation between peritoneocele and duration of constipation. In agreement with this study, Gabel *et al.,*(Beer-Gabel *et al.,* 2008)showed that all symptoms were generally of the same duration in those patients with a concomitant cul-de-sac hernia (Cul-de-sac patients 6 vs 5 years in no cul-de-sac patients; P= 0.691) with no statistical difference in these subgroups between those with or without a cul-de-sac hernia.

In the present study, the incidence of paradoxical puborectalis contraction during defecography was 3/30 patients (10%) and all were males. Rentsch *et al.,*(Rentsch *et al.,* 2001)detected paradoxical puborectalis contraction in 3/20 (15%) of their patients and all were males like the current study and also Martin *et al.,*(Martín *et al.,* 2012)detected it in 3/30(10%) while Paetzel *et al.,*(Paetzel *et al.,* 2001) detectedit in 3/15(20%) which all are comparable to the present study results. The current study reported no significant correlation between gender, age and duration of constipation with the incidence of paradoxical puborectalis contraction. In concordance with the current study, Bouchoucha *et al.,*(Bouchoucha *et al.,* 2004)reported no significant correlation between anismus and no anismus groups regarding the gender ratio and age. Also, Regadas *et al.,*(Murad-Regadas *et al.,* 2011)' reported that age doesn't influence the incidence of non-relaxing puborectalis muscle in patients with ODS with (p=0.1340) between the two age groups, also Karlbom *et al.,*(Karlbom *et al.,* 2005) evaluated paradoxical puborectalis muscle activity by a strain/squeeze Index and reported there were no overall correlations between indices and age. On the other hand, Andrade *et al.,* (Andrade *et al.,* 2014) reported that dyskinetic puborectalis syndrome cases in men was (37.5%) with a significant higher incidence of this syndrome in men than in women (p = 0.01). the significant difference may be due to large patient sample included in this study (300 patients).

Additionally, Karlbom *et al.,*(Karlbom *et al.,* 2005) reported there were no overall correlations between indices and duration of symptoms.. In another study, Stewart *et al.,* found that anismus was more prevalent in younger patients and decreased over time (Stewart *et al.,* 1992) through evaluation the

relationship between anismus and age-related changes, by stratifying patients into decades (21-30, 31-40, 41-50, 51-60, 61-70, 71-80, and over 80 years) with (p/0.0048).This discrepancy may be due to differences in study population. The real prevalence of paradoxical puborectalis contraction is difficult to be assessed as it is known that false positive and false negative results are very common with different tests including anorectal manometry, balloon expulsion, and electromyography (D'Hoore and Penninckx 2003, Jones *et al.,* 1987), Also, voluntary contraction of the pelvic floor due to embarrassment or reluctance to evacuate in front of others, may simulate a functional disorder and cause false positive findings of dyskinetic puborectalis syndrome (Kuijpers and Bleijenberg 1985).

In the present study, the prevalence of uterine prolapse during defecography was 4/30 patients (13.3%). Other studies have reported a prevalence of uterine prolapseHendrix *et al.,*(Hendrix *et al.,* 2002) was (14.4%),Younis *et al.,*(Younis *et al.,* 1993) was (7.9%). The World Health Organization (WHO) has also reported a global prevalence range of 2-20% among women below age 45 years. These rates indicate that uterine prolapse is a significant public health problem all over the world that causes a considerable burden on women and the society (WHO 1990, Omran and Standley 1981). The current study reported that mean age of uterine prolapsed patients (48.50 ± 13.67) was significantly higher than mean age of the unaffected group (35.46 ± 11.52) (P=0.049) .In agreement with the current study, Hendrix *et al.,*(Hendrix *et al.,* 2002) observed the rate of uterine prolapse was 14.2% and reported that uterine prolapse was higher among older women (age compared with 50-59 (y), 60-69 was 1.03-1.30 and 70-79 was 1.19-1.56). Also, Dietz (Dietz 2008) found that uterine descent signifies the extent of descent of the leading edge of the cervix uteri, and reported a significant correlation between uterine descent and age.

The current study reported no significant correlation between uterine prolapse and duration of constipation. This could be explained by that excessive stretching, tearing and multiple deliveries which are common in our population seem to be the main independent predisposing obstetric risk factors for symptomatic uterine prolapse. Caesarean delivery appears to have a protective effect on the development of the descent (Garshasbi *et al.,* 2006, Zhu *et al.,* 2008). In agreement with the current study, Ellerkmann *et al.,*(Ellerkmann *et al.,* 2001) found that, the presence of symptoms and the severity of symptoms did not correlate well with advancing stages of site-specific pelvic organ prolapse and that many common symptoms did not differentiate between compartments The most important finding in this study is that very few correlations were encountered between symptoms of pelvic floor dysfunction and the presence of pelvic organ prolapse although there were weak to moderate correlations.

With respect to several symptoms that are typically thought to be compartment specific, it was not possible to determine a specific stage of prolapse at which these symptoms became more pronounced. Also, Alves *et al.,*(Alves-Ferreira *et al.,* 2012)demonstrated that abnormal perineal position is not related to the severity of symptoms using MRI defecography and Knowles Eccersley Scott Symptom Score (KESS) with (p=0.19) between normal and abnormal groups. In a recent studies, Carter and Gabel(Carter and Gabel 2012) and Hausammann *et al.,*(Hausammann *et al.,* 2009) reported that there was no significant correlation existed between the size of the rectocele or degree of intussusceptions and degree of constipation (Cleveland score). Broekhuis *et al.,*(Broekhuis *et al.,* 2009) reported poorer correlations between pelvic floor dysfunctions and cystocele, uterine descent/vaginal vault prolapse, or rectocele separately. In other words, there is no specific symptoms' degree related to the descent in the different compartments. Klingele *et al.,*(Klingele *et al.,* 2005) found no association between the severity of pelvic organ prolapse and symptom degree of obstructed defecation. Kahn *et al.,* (Kahn *et al.,* 2005) reported that most associations between bowel symptoms and vaginal or pelvic organ descent were weak. These findings are in accordance with those reported by Jelovsek *et al.,*(Jelovsek *et al.,* 2005) who found no relationship between constipation severity and the stage of pelvic organ prolapse.

Conclusions

Dynamic pelvic MRI defecography is reliable and reproducible techniques for demonstrating the abnormalities that may contribute to obstructed defecation. Dynamic MRI defecography is becoming increasingly popular in the assessment of obstructive defecation.

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