The Frequency of Pelvic Floor Dysfunctions and their Risk Factors in Women aged 40-55

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Abstract

Objective: The aims of this study were to determine the frequency of urinary and fecal incontinence and their determinants in pre-menopausal and menopausal women in Iran.

Materials and methods: This one-year cross-sectional study was performed on 304 women aged 40-55 who were admitted to women's clinic at Imam Khomeini Hospital. Symptoms of urinary, gas, and fecal incontinence and pelvic organs prolapse were diagnosed by a specialist through examination and a questionnaire. Patients were divided into two groups of with and without (urinary, gas, and fecal) incontinence symptoms. The probable risk factors of these disorders were studied and registered in the questionnaire and compared using t-test, chi-squared test, and regression of quantitative and qualitative variables.

Results: Generally, 129 (42%) out of 304 women had pelvic floor dysfunction (urinary and fecal incontinence, and pelvic organs prolapse). Risk factors including menopause, hormone therapy, history of hysterectomy, inactivity, age, BMI, and first child's birth weight were compared between the two groups using chi-squared and t tests. There was a statistically significant difference between the two groups (P=0.000) as risk factors were more frequently observed in women with incontinence symptoms..

Conclusion: Some risk factors of pelvic floor dysfunction are menopause, hormone therapy, history of hysterectomy, inactivity, age, BMI, and first child's birth weight. Therefore, some strategies should be included in women's health education programs to prevent the above-mentioned risk factors.

Keywords: Urinary stress incontinence, Menopause, POP-Q system

Introduction

Pelvic dysfunction includes pelvic organs prolapse, and urinary and fecal incontinence. Pelvic organs prolapse is defined as shift of organs such as bladder, uterus, and small intestine into or out of vagina. Urinary and fecal incontinence refer to involuntary discharge of urine or feces (1, 2).

The direct effects of the dysfunction on urinary and gastrointestinal tracts and sexual activity can affect women's daily activities and cause them trouble. Therefore, precise identification of this problem and its risk factors is the first step in helping women who suffer from this problem.

Problems related to pelvic organs support cause thousands of gynecologic surgeries annually. However, there is neither sufficient nor exact information regarding the degree of prolapse in

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women who have received surgery, yet. Therefore, reference to the number of pelvic organs prolapse surgeries does not correctly reflect the prevalence of this problem (3).

Factors that may cause pelvic floor dysfunction include congenital factors like Spina-bifida, acquired factors like pregnancy and delivery, stroke, menopause, increase in intra-abdominal pressure, ascites, and history of pelvic surgery (4).

Jelovsek also reported a significant relationship between urinary and fecal incontinence with female gender and old age. In addition, increased body mass index and limited physical activities are associated with an increase in the prevalence of urinary incontinence; however, the relationship between physical activity and fecal incontinence is less investigated (5).

Urinary incontinence can be seen in 17% to 45% of the female adults (5, 6). Also, fecal incontinence is observed in 4% to 17% of them and increases by aging (6).

Several epidemiological studies in different populations have reported various factors in the development of pelvic floor dysfunction, especially urinary incontinence. These problems are the reason for 20% of women's surgeries (7). Hence, regarding the importance of these problems, it is necessary to recognize their possible risk factors in order to prevent or at least decrease their incidence. The aims of this study were to determine the frequency and risk factors of pelvic floor dysfunction including urinary and fecal incontinence and pelvic organs prolapse in pre-menopausal and menopausal women who were admitted to the women's clinic at Vali-e-Asr Hospital.

Materials and methods

This cross-sectional study was performed on women aged 40-55 years who were admitted to the women's clinic at Vali-e-Asr Hospital during one year, from Jan 2007 to Jan 2008. Participants were evaluated for the symptoms of urinary incontinence (urinary leakage in any amount at least once a month), gas and fecal incontinence (unwanted and spontaneous passage of gas and solid or liquid feces), and pelvic organs prolapse (sensation of protrusion and pressure or vaginal prolapse by the patient) based on a standard questionnaire, medical examination and diagnosis of incontinence and the findings were documented.

A gynecologist examined the patients in the lithotomy position for any mass, pelvic infection or urine leakage during increased intra-abdominal pressure. Pelvic organs prolapse was examined based on the POP-Q test and stage≥III was considered as pelvic organs prolapse (pelvic organs protrusion more than 1cm below hymen).

Spells of urinary incontinence with cough, laugh, and sneeze (stress incontinence) or feeling a sudden need or urge to urinate and involuntary leakage of urine before a toilet can be reached (urge incontinence) were asked. A history of urinary and fecal incontinence and prolapse surgery, underlying diseases such as diabetes, bronchitis, hypertension, urinary tract infection, and a history of cesarean or vaginal delivery (both in one patient) were regarded as exclusion criteria of our study. Individuals were then divided into two groups of with and without urinary incontinence (stress, urge, stress and urge, gas and fecal incontinence), and the risk factors (age, body mass index, first child birth weight, rate of physical activities, smoking, history of hysterectomy, level of education, menopause status, and hormone administration were investigated and compared between the two groups.

Data were analyzed with SPSS software using chi-squared and t tests. Logistic regression was applied to determine the association between the variables and incontinence (urinary stress, urge, gas, and fecal incontinence together). P-values less than 0.05 were considered statistically significant.

Results

In this research, 304 women aged 40-55 years were studied and symptoms of urinary and fecal incontinence and pelvic prolapse were determined based on a standard questionnaire and diagnosis of a specialist.

Patients were divided into two groups of with (n=129, 42%) and without (n=175, 58%) pelvic floor dysfunction (urinary and fecal incontinence and pelvic organs prolapse). Moreover, 98 (32%) individuals had both urinary stress and urge incontinence while no one was found to only have urinary urge incontinence. Eighteen (5.9%) participants had gas and fecal incontinence and 13 (4.3%) had pelvic organs prolapse.

Comparison of risk factors including menopause, hormone administration, history of hysterectomy, inactivity, age, BMI, and first child's birth weight with chi-squared and t tests showed a statistically significant difference between the two groups (P=0.000) as the risk factors were observed in a higher percentage of women with incontinence symptoms, meaning that incontinence was observed

more in menopausal, older and inactive women who had a higher BMI and more parity on the average, received no hormone therapy, and gave birth to heavier first children.

Regression also showed that menopause, no hormone administration, history of hysterectomy, inactivity, age, BMI, last child's weight, and parity were also the risk factors of incontinence in 40- to 55-year-old women.

Table 1: Frequency of (urinary, fecal) incontinence and pelvic prolapse in women admitted to the women's clinic at Vali-e-Asr Hospital

	Frequency n (%)
Urinary stress incontinence	73 (24%)
Stress and urge incontinence	25 (8%)
Fecal incontinence	18 (5.9)
Pelvic organs prolapse	13 (4.3)

Table 2: Comparison of underlying risk factors in both groups of with and without (urinary and fecal) incontinence in women admitted to the women's clinic at Vali-e-Asr Hospital

	No	Yes	P-value
Menopause status- n (%)			
- Yes	95 (60.1)	63 (39.9)	0.0001
- No	131 (89.7)	15(10.3)	
Level of education- n (%)			
- Less than high school diploma	116 (56)	59 (33)	0.0001
- More than high school diploma	90 (43)	39 (40)	
Hormone therapy- n (%)			
- No	108 (65.5)	57 (34.5)	0.0001
- Yes	118 (84.9)	21 (15.1)	
Hysterectomy history- n (%)			
- No	210 (77.5)	61 (22.5)	0.0001
- Yes	16 (48.5)	17 (51.5)	
Smoking status- n (%)			
- No	210 (74.5)	72 (25.5)	0.85
- Yes	16 (72.7)	6 (27.3)	
Level of activity- n (%)			
- None	11 (30.6)	25 (69.4)	0.0001
- Moderate	109 (75.2)	36 (24.8)	
- High	106 (86.2)	17 (13.8)	
Age (mean ± SD)	47.38 ± 4.50	51.55 ± 3.65	0.0001
BMI (mean ± SD)	20.73 ± 1.69	23.02 ± 1.77	0.0001
First child birth weight (mean ± SD)	2437.17 ± 1.08	2919.23 ± 1.06	0.001
Parity- n (%)	1.52 ± 0.95	2.05 ± 1.08	0.0001
Type of delivery- n (%)			
- None	33 (16)	8 (19.5)	0.08
- Cesarean	98 (47)	44 (31)	
- Vaginal	75 (37)	40 (38)	

Table 3: Relationship between risk factors and (urinary, fecal) incontinence

		With incontinence	Without incontinence	P-value	CI	Exp(β)
Menopause- n (%)		61%	40%	0.0001	2.515-9.543	4.899
No hormone therapy- n(%)		73%	48%	0.001	0.174-0.628	0.331
Hysterectomy- n (%)		22%	7%	0.057	0.974-5.784	2.374
Physical inactivity- n (%)		32%	5%	0.0001	0.334-0.597	0.374
BMI (mean± SD)		23 ± 1.7	20.7 ± 1.69	0.0001	0.082-0.123	
Age (mean± SD)		51.55 ± 3.15	47.38 ± 4.50	0.0001	0.015-0.032	
Birth weight of the child (mean± SD)		2919.23 ± 1.06	2437.17 ± 1.08	0.0001	0.000-0.000	
Parity (mean± SD)		1.52 ± 0.95	2.05 ± 1.08	0.0001	0.01-0.05	0.02
Type of delivery n (%)	None	33 (16)	8 (19.5)	0.05	0.97-5.78	2.37
	Cesarean	98 (47)	44 (31)			
	Vaginal	75 (37)	40 (38)			

Discussion

Findings of the present study revealed urinary stress incontinence in 24%, stress and urge incontinence in 8%, fecal incontinence in 5.9%, and pelvic organs prolapse in 4.3% of women aged 40-55 years.

Numerous epidemiologic studies in different populations have evaluated many factors in the development of pelvic floor dysfunction, especially urinary incontinence. Moreover, vaginal flaccidity is prevalent and the reason for about 20% of women's surgeries in developed countries (6). Walker (2011) reported the mean global prevalence of pelvic organs prolapse (POP), urinary incontinence, and fecal incontinence as 19.7% (3.4-56.4), 28.7% (5.2-70.8), and 7% (5.3-41), respectively (7, 8).

Sobhgol (2008) performed a study in Iran on 330 women aged 15-49 years and reported 31.8%, 25.5%, and 19.4% of the participants had stress, urge, and the combination of both types of urinary incontinence, respectively (9). Also, Sadeghi-Hassanabad conducted a study in Iran on 1010 women of Fars Province with a mean age of 37.4 years and reported the prevalence of 53.6% and 27% for POP and UI, respectively (10). Besides, Garshasbi (2002) has reported the POP rate of 53% in 3730 Iranian females (11). Younis in China has reported the rate of 18.9% for urinary stress incontinence, 2.6% for urge incontinence, and 9.4% for both stress and urge incontinences in 19024 women of 20-99 years old (12).

Rizvi has studied 186 Pakistani women above 15 years and reported 44.4% urinary and separately 17.2% stress and 9.7% urge incontinences (13). Wasu-Anask has reported the POP of 12.1% in 174 women of age 15-81 (14).

It is worth mentioning that in this study we have just considered prolapse as prolapse in stage≥ III. The difference between the POP and incontinence prevalence in different countries may be due to the type of study, age group of the patients, differences in the symptoms of these disorders, stage of pelvic organs prolapse, and race. Also, different prevalence is reported around the world considering the role of malnutrition and anemia in weakening the pelvic floor muscles tension and effective factors in the incidence of incontinence. Walker GJ recommends more precise studies with attention to the type of nutrition in affected women (14).

Pelvic floor dysfunction and incontinence affect females of all ages and some of their risk factors include parity, age, BMI, and hysterectomy (15).

Our study results that aging, parity, and gaining weight are associated with the (urinary and fecal) incontinence. In a review study, the quantitative and qualitative defects of collagen issue and levator muscle of anus were regarded as important predisposing factors of pelvic floor dysfunction. Based on this study, parity, vaginal delivery, menopause, and age are the proved risk factors of collagen issue defects and dysfunction in levator muscle of anus. Racial difference was also considered in the dysfunction of these issues (16).

In 2004, Walter study showed that African and American women had the least probability for pelvic prolapse while Spanish were more at risk (17).

Besides, increase in parity (more than 5) and body mass index severely increase the chance of pelvic muscles flaccidity (16). This relation was strongly confirmed in Sobhgol study in Iran (9). A study in Zambia confirmed the relationship between multiparity (more than 8 deliveries) and the risk of POP (17). Also, women in the age group 45-55 were almost 2 times at risk of POP as compared to others.

It seems that muscle tension, repeated perineal tearing, pelvic floor neuropathy in subsequent deliveries, aging, and decrease in sex hormones are the main reasons for pelvic dysfunction.

Increased intravesical pressure due to increased BMI leads to a decrease in the slope of urinary continence between the bladder and the urinary tract; in this situation, since the static intravesical pressure is high, urine leaks even at low intra-abdominal pressures (18, 19). Moreover, evidence suggests that women with a high BMI have mutations in the adrenergic receptor which results in the weakness of detrusor muscles and causes urinary incontinence (20, 21).

Another finding of the present study was a significant relationship between hormone therapy and a reduction in incontinence. A study by Lachowsky M showed an increase in pelvic floor dysfunction due to decreased levels of estrogen hormones during menopause and atrophy of the genitourinary system which subsided following hormone therapy (22) while no relationship was found between pelvic floor prolapse and hormone therapy in a study performed by Nygard (23). Goldstein noted different results of hormone therapy in decreasing pelvic floor dysfunction and concluded that these differences were due to the effects of the hormones on pelvic floor estrogen receptors that consequently reduced these disorders (24). Hendrix also reported a relationship between hormone therapy and uterine prolapse (25).

Results of the present study revealed that physical inactivity was related to pelvic organs prolapse. Ali-Ross NS and Bracken IH noted that pelvic organs prolapse was more frequent in individuals with more physical activity (26, 27). Immobility in our study and increased physical activity in other studies have been shown to result in these complications. Pelvic floor muscles play an important role in controlling pelvic organs and their weakness results in prolapse in women. Therefore, it seems that the role of average physical exercise and activity in strengthening these muscles should not be ignored. Hence, immobility can be regarded as a risk factor in weakening these muscles and causing prolapse and the resultant incontinence among pre-menopause and menopause women although further studies are recommended in this regard.

Different findings of the studies can be due to differences in individuals' age, tools and systems of measuring pelvic floor dysfunction. A more precise study with a larger sample size and a standard method for assessing pelvic floor dysfunction and comparing effective factors is necessary to better elucidate the possible role of some factors.

Conclusion:

Pelvic organs prolapse and incontinence are prevalent in older women and are associated with body mass index, age, menopause, no hormone therapy, and low activity. Larger case-control studies are required to assess the relationship of risk factors with anatomic findings and symptoms of these disorders.

In addition, it is recommended to reduce pelvic floor dysfunction and incontinence by implementing some measures such as weight control, education, and inclusion of pelvic floor muscles exercise in women's daily life schedule.

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