


Fecal Incontinence or Pelvic Organ Prolapse Among Women with Premature Ovarian Insufficiency

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Abstract

Objectives To assess the status of the pelvic floor muscle (PFM) of premature ovarian insufficiency women (POI women) and the incidence of fecal incontinence (FI) and pelvic organ prolapse (POP).

Methods A secondary analysis of a cross-sectional study with 150 women with POI was performed. Pelvic floor muscle assessment was performed with the PERFECT scale. The subscales POPDI-6 and CRADI-8 of the questionnaire Pelvic Floor Distress Inventory-20 (PFDI-20) were used for pelvic floor symptoms focused on FI and POP. Moreover, FI and POP were also assessed as dichotomous variables (yes/no).

Results Women with FI and POP did not present differences in the PFM assessment across P ($p = 0.61$), E ($p = 0.78$), R ($p = 0.22$), and F ($p = 0.79$) variables when compared with women with POI; no differences were also seen between women with and without POP according the pelvic muscles: P ($p = 0.91$), E ($p = 0.99$), R ($p = 0.62$), and F ($p = 0.10$). Women with FI and POP presented higher scores in all PFDI-20 subscales and total score when compared with the control group ($p < 0.05$).

Conclusions Pelvic floor muscle assessment within POI women with or without FI or POP did not differ. However, PF symptoms are more severe in the FI or POP groups.

Keywords

- fecal incontinence
- pelvic organ prolapse
- premature ovarian insufficiency
- PFDI-20
- pelvic floor muscles

Introduction

Premature ovarian insufficiency (POI) is defined as the reduction and/or loss of ovarian function under the age of 40 years old.¹ This hypoestrogenism state can lead to the multiple health risks, since estrogen receptors are found in the female squamous epithelium of the proximal and distal urethra, vagina, bladder trigone, in the squamous epithelium of the anal canal, as well as in the urethral sphincter, uterosacral ligaments and pelvic floor musculature.²

Fecal incontinence (FI), defined as involuntary loss of feces and/or flatus,³ is more common in the postmenopausal period and older age; however, the evidence is scarce regarding estrogen treatment to reduce FI symptoms.⁴ Age is another risk factor⁵ for pelvic organ prolapse (POP), defined as the bulging of pelvic organs by the vaginal canal.⁶

Hormone therapy (HT) containing estrogen is considered the best and most important treatment for POI-women to reduce the risk of impairment due to hypoestrogenism, with

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some evidence in repercussions on bone health, cardiovascular system, and general symptoms.¹ However, the use of HT was not associated with a change in the frequency of FI in a previous cross-sectional study.⁷ The frequency of FI was 4% higher in the POI group (8% prevalence versus 4% non-POI group), but this was not statistically significant.⁸

It is still unknown whether the hypoestrogenic state would modify the assessment of the pelvic floor muscles (PFMs) in POI women with FI; the present study aimed to investigate if women with POI present different PFM assessment by physical examination, and symptoms according to the presence of FI or POP.

Materials and Methods

The present cross-sectional study was performed in 150 women that presented the diagnosis of POI according to the ESHRE criteria at the Outpatient Clinic of Gynecological Endocrinology, Womens Hospital, Universidade de Campinas, Campinas, state of São Paulo, Brazil. Detailed methodology was previously published elsewhere.^{7,8} The institutional Review Board has approved the present study (CAAE 73266217.9.0000.5404). Women were enrolled after signing an informed consent.

The exclusion criteria for POI-women was the presence or previous history of inferior genital tract cancer, previous treatment with pelvic radiotherapy, current pregnancy, previous urogynecological surgery (for example, sling, anterior/posterior colporrhaphy, Burch colposuspension). In the present study, we performed a secondary analysis to assess the association between PFM and FI/POP.

Fecal incontinence was defined as involuntary loss of liquid or solid stools.³ Flatus incontinence was incorporated into this concept. Pelvic organ prolapse was defined as the presence of bulging symptoms and pelvic pressure; POP-Q classification was performed in women that agreed to participate.⁶

A physical exam was performed for PFM assessment. All POI-women were invited to perform PFM assessment, which was performed by the Laycock power. Power (P), is maximum voluntary contraction graduated/assessed by the Oxford modified scale (0 to 5); Endurance (E), duration of contraction (seconds) sustained with the assessed power; Repetitions (R) is the capacity to repeat the sustained voluntary

contraction with the reached contraction in power; Fast contractions (F), as the number of fast contractions that women can present; and, finally, every contraction timed (ECT), not performed in the present study; according to the PERFECT scale,⁹ and always by the same physiotherapist (Fante J. F.). They were positioned in the lithotomy position and the examiner performed the assessment using vaginal digital palpation. Gloves and lubricant were used. Digital palpation was performed after a request for voluntary contraction of the pelvic floor muscles and was preceded by a mean pressure of the PFM so that women would understand the place that they should be contracting.

The Pelvic Floor Distress Inventory-20 (PFDI-20) questionnaire validated for Brazilian Portuguese language was used for general pelvic floor symptoms (vaginal, fecal, and urinary subscales). It presents three subscales: Pelvic Organ Prolapse Distress Inventory (POPDI-6), Colorectal-Anal Distress Inventory (CRADI-8), and Urinary Distress Inventory (UDI-6). Each question started with a yes/no answer. Each subscale presented a mean score multiplied by 25 (0 to 100) and the total sum would vary from 0 to 300. The higher the score, the greater the symptomatology.¹⁰ Two subscales (POPDI-6 and CRADI-8) were used to assess POP and IF.

The chi-squared and t-Student tests were performed for, respectively, categorical, and continuous variables. A significance level of 5% was considered. Statistical analysis was performed at SAS version 9.3 (SAS Institute; Cary, North Carolina, USA).

Results

A total of 150 women with POI using HT were included, of which 12 (8%) had FI and 14 (9.3%) had POP. Among those with FI or POP, ~ 60 and 40%, respectively, were nulliparous. Most women with FI were young, with normal BMI, self-reported to be white, nonsmokers, with sexual activity, in addition to presenting comorbidities. These variables did not differ when compared with POI women without FI. Premature ovarian insufficiency women with POP were also young, obese compared with those without POP ($p = 0.004$), nonsmokers, with sexual activity (– **Table 1**).

► **Table 2** displays POI clinical variables and PERF and PFDI-20 scores for women with and without POP or FI. There

Table 1 Baseline variables from POI women with and without FI or POP

Variables	FI	wFI	Total	<i>p-value</i> ^a	POP	wPOP	Total	<i>p-value</i> ^a
Age (mean/SD)	37.17/8.29	35.26/8.62	–	0.42	35.14/7.56	35.44/8.70	–	0.70
BMI (mean/SD)	24.53/5.14	26.57/5.45	–	0.20	30.80/7.59	25.95/4.99	–	0.01
Age (years old)								
< 20	0	6.52 (9)	9	0.96	0	6.62 (9)	9	0.72
20–29	25 (3)	19.57 (27)	30		21.43 (3)	19.85 (27)	30	
30–39	41.67 (5)	36.96 (51)	56		50 (7)	36.03 (49)	56	
40–48	33.33 (4)	36.96 (51)	55		29.57 (4)	37.50 (51)	55	

Table 1 (Continued)

Variables	FI	wFI	Total	p-value ^a	POP	wPOP	Total	p-value ^a
Education level (years)								
< 8	0	15.22 (21)	21	0.44	21.43 (3)	13.24 (18)	21	0.33
9–11	75 (9)	65.94 (91)	100		78.57 (11)	65.44 (89)	100	
11–15	16.67 (2)	12.32 (17)	19		0	13.97 (19)	19	
> 15	8.33 (1)	6.52 (9)	10		0	7.35 (10)	10	
Race								
White	50 (6)	52.17 (72)	78	0.56	28.57 (4)	54.41 (74)	78	0.11
Black	25 (3)	9.42 (13)	16		21.43 (3)	9.56 (13)	16	
Yellow	0	2.17 (3)	3		7.14 (1)	1.47 (2)	3	
Brown	25 (3)	33.33 (46)	49		42.86 (6)	31.62 (43)	49	
Other	0	2.90 (4)	4		0	2.94 (4)	4	
Tobacco use								
Yes	8.33 (1)	5.80 (8)	9	0.53	7.14 (1)	5.88 (8)	9	0.59
No	91.67 (11)	94.20 (130)	141		92.86 (13)	94.12 (128)	141	
Gravidity								
0	58.33 (7)	68.12 (94)	101	0.07	42.86 (6)	69.85 (95)	101	0.07
1	0	15.22 (21)	21		28.57 (4)	12.50 (17)	21	
≥ 2	41.67 (5)	16.67 (23)	28		28.57 (4)	17.65 (24)	28	
Presence of comorbidities								
Yes	75 (9)	60.14(83)	92	0.37	100 (14)	57.35 (78)	92	0.00 ^a
No	25 (3)	38.86 (55)	58		0	42.65 (58)	58	
Any endocrinopathies								
Yes	25 (3)	12.32 (17)	20	0.20	14.29 (2)	13.24 (18)	20	1.0
No	75 (9)	87.68 (121)	130		85.71 (12)	86.76 (118)	130	
Obesity								
Yes	8.33 (1)	18.84 (26)	27	0.09	35.71 (5)	16.18 (22)	27	0.13
No	91.67 (11)	81.16 (112)	123		64.29 (9)	83.82 (114)	123	
Diabetes								
Yes	0	5.80 (8)	12	1.0	7.14 (1)	5.15 (7)	8	0.55
No	100 (12)	94.20 (130)	142		92.86 (13)	94.85 (129)	142	
Other comorbidities								
Yes	50 (6)	44.93 (62)	68	0.73	71.43 (10)	42.65 (58)	68	0.03 ^a
No	50 (6)	55.07 (76)	82		28.57 (4)	57.35 (78)	82	
Standing position during work								
Yes	58.33 (7)	69.57 (96)	103	0.51	64.29 (9)	69.12 (94)	103	0.76
No	41.67 (5)	30.43 (42)	47		35.71 (5)	30.88 (42)	47	
Sitting position during work								
Yes	41.67 (5)	52.90 (73)	78	0.45	50 (7)	52.21 (71)	78	0.87
No	58.33 (7)	47.10 (65)	72		50 (7)	47.79 (65)	72	
Carry weight during activities								
Yes	16.67 (2)	18.12 (25)	27	1.0	35.71(5)	16.18 (22)	27	0.13
No	83.33 (10)	81.88 (113)	123		64.29 (9)	83.82 (114)	123	

Abbreviations: FI, fecal incontinence; POP, pelvic organ prolapse; wFI, without fecal incontinence; wPOP, without pelvic organ prolapse.

^aMann-Whitney for continuous variables and chi-squared test; Values in % in parenthesis.

Table 2 POI clinical variables, PERF and PFDI-20 subscales and total score from POI women with and without FI or POP

Variables	FI (n = 12)				wFI				POP (n = 14)				wPOP			
	n	Mean	SD	p-value*	n	Mean	SD	p-value*	n	Mean	SD	p-value*	n	Mean	SD	p-value*
Duration of gonadal failure	9	41.56	36.16		86	124.84	100.39	< 0.05	12	100.83	119.80		83	119.28	96.41	0.23
Age at diagnosis	12	28.75	8.28		138	25.25	8.79	0.18	14	27.57	7.51		136	25.32	8.90	0.39
Total duration using hormone therapy	10	109.60	121.46		127	116.13	103.03	0.73	12	70.25	74.86		125	120.02	105.56	0.11
P	10	2.50	1.08		60	2.25	0.86	0.61	14	2.29	0.91		56	2.29	0.89	0.91
E	10	5.00	5.58		60	4.40	3.43	0.78	14	4.57	3.84		56	4.46	3.78	0.99
R	10	2.90	2.02		60	2.13	1.91	0.22	14	1.93	1.54		56	2.32	2.02	0.64
F	10	4.10	2.96		59	4.22	3.15	0.79	14	3.14	2.77		55	4.47	3.15	0.10
POPDI6	12	17.71	16.58		138	3.93	7.75	< 0.05	14	17.56	9.27		136	3.74	8.52	< 0.05
CRADI8	12	32.03	19.86		138	7.38	10.60	< 0.05	14	19.87	15.53		136	8.27	12.65	< 0.05
UDI6	12	40.97	32.94		138	9.42	16.41	< 0.05	14	30.95	25.67		136	9.99	18.39	< 0.05
Total score	12	90.71	60.91		138	20.73	28.52	< 0.05	14	68.38	35.07		136	22.00	34.75	< 0.05

Abbreviations: FI fecal incontinence; PFDI-20, pelvic floor distress inventory-20; POI, premature ovarian insufficiency; POP, pelvic organ prolapse; wFI, without fecal incontinence; wPOP, without pelvic organ prolapse.

*Mann-Whitney test; n in parenthesis.

was no difference between groups regarding duration of gonadal failure, age at POI diagnosis, and total duration using HT; however, the symptomatology of pelvic dysfunctions can be verified by the presence of worse scores for the subscales POPDI-6 and CRADI-8 in the presence of POP and IF.

Among POI-women, PFM assessed by PERFECT, did not present differences among those with or without FI regarding P ($p = 0.61$), E ($p = 0.78$), R ($p = 0.22$), and F ($p = 0.79$). No statistically significant differences were seen between women with and without POP regarding the same variables: P ($p = 0.91$), E ($p = 0.99$), R ($p = 0.64$), and F ($p = 10$). However, POI women, regardless of the presence of pelvic floor disorders (PFDs), presented low PERF scores.

Regarding the PFDI-20, women with FI and POP presented higher scores in all subscales and total score ($p < 0.05$), especially in the following scales: Pelvic Organ Prolapse Distress Inventory (POPDI-6, scores for with and without POP 17.56 ± 9.27 and 3.74 ± 8.52 , respectively; $p < 0.05$) and Colorectal-Anal Distress Inventory (CRADI-8, scores respectively 32.03 ± 19.86 and 7.38 ± 10.60 , respectively; $p < 0.05$ for those with or without FI).

Discussion

The present study with POI-women using HT containing estrogen has shown that ~ 8 and 9% presented FI and POP, respectively; however, it is noteworthy that, among these, most of them were nulliparous, using HT, and their PFM presented low PERF scores; maybe strengthening the pelvic floor will not solely depend on the hormonal levels or the influence of parity in these patients. Moreover, it indicates the need to reinforce the prevention of the weakening of the perineal muscles, especially focusing with physical therapy. But further studies are needed to confirm these findings.

Pelvic floor disorders are highly prevalent conditions in women, affecting almost 25% of women in the United States.¹¹ In Brazil, the prevalence rate of FI was 15% and 22.22% for POP, considering postmenopausal women.^{12,13} Many risk factors are associated to PFDs. In a recent published study, older age is associated with anal incontinence, and POP was significantly associated with parity and higher BMI.¹⁴

It is known that FI and POP present similar risk factors as for UI (urinary incontinence).^{15,16} Furthermore, women with higher odds to developing FI are those with stress UI, and this reinforces how these disorders are intimately related.

Another interesting result from the present investigation is that we did not find significant differences on the PFM assessment between groups about the presence of FI or POP, when the PERFECT scale was used. It seems that PFM function may not correlate with the presence of symptoms. However, women with or without FI or POP presented, in general, weaker PFMs according to the modified Oxford scale. In a previous study from our group, we did not find an association between the presence of UI and PFM assessment within POI women.⁸

To our knowledge, this is the first study that evaluated the PFM assessment of FI and POP in women with POI. The

weaknesses of the present study are the recall bias, not being able to establish causality due to the cross-sectional study design, the small sample size of women with FI or POP, and a possibility of type 2 error as this was a secondary analysis from a study that was studying urinary incontinence. Moreover, our group of patients not using HT for POI was small; however, this is due to the fact that most of the patients were already being followed-up in our service. It would be unethical not to offer HT for these women to follow the natural history of their symptoms. Moreover, we believe that the frequency of FI or POP within this group using HT was high, given the younger age and the rate of nulliparity among this group, and perhaps data can be worse for women without using HT in a larger sample. Given that, a prospective, long-term follow-up of these patients as soon as they get to the outpatient clinic would be necessary. Furthermore, a more specific study addressing bowel function and using specific exams for FI among these women would be paramount to explore this variable.

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Conflict of Interests

The authors have no conflict of interests to declare.

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