

Pelvic Floor Dysfunction among Primiparous Woman After Vaginal Delivery and Cesarean Section: A Prospective Cohort Study

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Abstract

Background: Pelvic floor disorders include urinary incontinence, fecal incontinence, pelvic visceral prolapse, and sexual dysfunction, which are more common in women after childbirth. In the present study, we aimed to investigate and compare pelvic floor disorders in primiparous women 2 and 6 months after vaginal delivery and cesarean section by using a questionnaire, clinical examination, and perineometer at the same time.

Methods: This Prospective cohort study was performed on 76 primiparous mothers under normal delivery and cesarean section. All participants were examined after 2 to 6 months after delivery by perineometer pelvic organ prolapse quantification test (POPQ), pelvic floor distress questionnaire (PFDI-20), and female sexual function index (FSFI).

Results: The mean of perineometer power and FSFI in the cesarean section group was significantly higher than in the vaginal delivery group ($P < 0.001$). Otherwise, the mean of Anterior and posterior wall prolapse severity and mean of PFDI in the vaginal delivery group were significantly higher than cesarean section patients ($P < 0.05$ and < 0.001 , respectively).

Conclusion: Although the symptoms of pelvic floor muscle weakness, pelvic floor disorder, and the severity of prolapse in the vaginal delivery group was greater than the cesarean section, the improvement in sexual function and prolapse symptoms over time in the vaginal delivery group and obtaining the same results in questionnaires after 6 months, shows that most of these symptoms are temporary in the women who had an uncomplicated vaginal delivery, and passing of time, environmental factors and lifestyle are effective in improving most of the pelvic symptoms after delivery.

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Introduction

Pelvic floor disorders include urinary incontinence, fecal incontinence, and pelvic visceral prolapse, which are more common in women after childbirth. The prevalence of this disorder in the United States is reported to be 24%.¹ A study of 240 Iranian mothers aged 34-56 years showed

that 89% of patients have at least one of the pelvic floor disorders, which indicates a very high prevalence of this disorder among Iranian mothers.² Pelvic floor disorder causes physical and emotional problems for the patient and imposes a high cost to her.³ Risk factors for pelvic floor disorders include obesity, maternal age, hormonal imbalance during menopause, chronic bronchitis,

positive family history, vaginal delivery, episiotomy during childbirth, chronic constipation, smoking, multiple vaginal deliveries, and vascular collagen diseases.⁴ The prevalence of pelvic floor disorders after vaginal delivery has been reported twice compared to cesarean section.⁵ The prevalence of cesarean section among Iranian women has been reported from 16.2% to 66.5%.⁶ One of the reasons for the high prevalence of cesarean section among Iranian women, according to a study by Faisal et al.⁷ in 2014, was reported mothers' fear of complications after vaginal delivery like vaginal prolapse, urinary incontinence, sexual dysfunction.

Another study in 2015⁸ found that the prevalence of incontinence in mothers up to 12 years after vaginal delivery was 37.9%, and three-quarters of mothers experienced some degree of urinary incontinence forever.

As mentioned, vaginal delivery is a strong predictor of pelvic floor disorders, although some studies have not found a significant association between the two factors. On the other hand, in the studies conducted in Iran, the prevalence of this type of disorder has been reported differently and according to the best results of our search, no study has been done in this field in Isfahan so far.

The study aimed to investigate and comparing pelvic floor disorders in primiparous women in 2 groups of vaginal delivery and cesarean section 2 and 6 months after the end of pregnancy.

Methods

This Prospective cohort study was performed on 76 primiparous women who were referred to Isfahan educational Hospitals for delivery. The entrance criteria of the study were obtaining a written consent to participate in the study, being primiparous, delivering in term or near-term pregnancy, and being 20 to 45 years old. And The exclusion criteria were multiple vaginal deliveries, a history of any previous pregnancies, hysterectomy, employment with high physical activity, smoking, spinal disorders, coughs, and chronic constipation, the muscles and collagen-related diseases, history of pelvic and spine fractures, and pelvic and spine surgery and primiparous women who had gone under cesarean section after the start of the active phase of labor. And the criteria for leaving the study include not referring to continue examinations 2 and 6 months after delivery (for any reason), the occurrence of postoperative complications in the cesarean section including metritis and site infections, or infection and extensive hematoma followed by episiotomy in vaginal delivery. For all of the women in the vaginal delivery group, the episiotomy incision was done. None of them had experienced vaginal delivery with vacuum or forceps and none of them had a laceration greater than 2 degrees during delivery. Women who did not return for their second

visit after 6 months are considered as the dropout group (exclusion from the study).

We randomly selected 76 patients, half of whom had a vaginal delivery and half of whom had a cesarean section. Therefore, patients were divided into two groups. Patients with vaginal delivery and cesarean section patients.

First, the basic information of all participants was recorded, including age, body mass index, baby weight at birth, type of delivery (vaginal delivery with or without the use of episiotomy or operative vaginal delivery). After collecting the above information, all patients were examined 2 to 6 months after delivery for pelvic floor disorders with a perineometer to assess pelvic floor muscle strength, pelvic organ prolapse quantification test (POPQ), pelvic floor distress questionnaire (PFDI-20), and female sexual function index (FSFI).

The Pelvic Organ Prolapse Quantification test was designed in 2002 to assess the size, location, and severity of pelvic organ prolapse.⁹ For this purpose, patients are first asked to be in the lithotomy position after emptying the bladder and rectum, and the vagina and prineal body are measured in both muscular relaxation and valsalva maneuvers. So, by using the vaginal valve, the posterior edge of the vagina is pushed down and Aa, Ba, and C points are measured and recorded. the normal values of the indicators are below:¹⁰

Aa is equal to -3 when there is no prolapse and is up to +3.

Ba is equal to -3 when there is no prolapse and the maximum is equal to the total length of the vagina.

C is used when the patient has a hysterectomy and is not used in the present study.

Ap is equal to -3 when there is no prolapse and up to +3.

Bp is equal to -3 When there is no prolapse and the maximum is equal to the total length of the vagina.

The Pelvic Floor Distress Questionnaire (PFDI-20) evaluates the impact of pelvic floor muscle dysfunction on women's quality of life, including pelvic organ prolapse, urine and fecal incontinence. This questionnaire contains 20 questions and shows the patient's symptoms during the last three months, which are classified into three subgroups:

1. Colorectal-anal distress inventory 8 (CRADI-8)
2. Urinary distress inventory 6 (UDI-6)
3. Pelvic organ prolapsed distress inventory 6 (POPDI-6)

Each of these subgroups can be considered as an independent scale or all together as a single tool. This questionnaire is self-explanatory. The symptoms of pelvic organ prolapse include 6 questions about the pressure in the lower abdomen, the feeling of heaviness and fullness in the pelvic areas, the feeling or sight of a round object protruding from the vagina, the pressure on the vagina and rectum to move Proper

bowel movement and the feeling of incomplete emptying of the bladder and pressure on the vaginal areas to start or complete urination.

The urinary tract contains 6 questions about urinary frequency, urinary incontinence with emergency evacuation, incontinence with coughing, sneezing and laughing, urinary incontinence in the form of urine droplet leakage, difficulty in emptying the bladder, feeling pain, and discomfort around the genital area, and lower abdomen.¹¹

This questionnaire was translated and credited to Persian in a study in 2017 at Tabriz University of Medical Sciences.¹²

Each question is answered on 0 to 4 points Likert scale, with the patient considering the severity of their symptoms from zero as no symptoms and 4 as the most severe. The scores of the questions in each of the three domains are added together and multiplied by 25 to make them numerically from 0 to 100. Finally, the final score of each of the 3 scales is added together and a value of 0 to 300 is obtained.

The Female Sexual Function Index (FSFI) questionnaire is a women’s sexual performance index developed in 2000.¹³ This questionnaire has been translated and validated in Persian in the study in 2008.¹⁴

After collecting the above information, all the data entered the SPSS v.25 software. In the analytical statistics section, statistical t-test of paired tests, independent tests, chi-square, and Kolmogorov-Smirnov, and the Mann-Whitney statistical test were used as needed. The significance level in all tests was considered to be $P < 0.05$.

Results

In this study, 38 patients of vaginal delivery and 38 of

cesarean section were enrolled into study. There was no significant difference between groups based on age, BMI, and NBW ($P > 0.05$) (Table 1).

For all of the women in the vaginal delivery group, the episiotomy incision was done. None of them had experienced vaginal delivery with vacuum or forceps and none of them had a laceration greater than 2 degrees during delivery.

The mean of perineometer power in the cesarean section group was significantly higher than the vaginal delivery group after 2 and 6 months ($P < 0.001$) but changing of perineometer power after 6 months compared to 2 months after treatment was not significant in each group ($P > 0.05$).

The mean of PFDI in the vaginal delivery group was significantly higher than the cesarean section group after 2 months ($P < 0.001$) and the highest scores were related to the urinary tract questions in the vaginal delivery group. But there was no significant difference between groups based on PFDI after 6 months ($P = 0.07$). After 2 months, the delivery group’s mean FSFI was considerably lower than the cesarean section group. ($P < 0.001$). (Of course, given that some women did not have any intercourse during these 2 months after delivery the result is not very judgmental). However, after 6 months, there was no significant difference among the groups based on FSFI. ($P = 0.12$). Changing of PFDI and FSFI after 6 months compared to 2 months was significant in both groups ($P < 0.001$) (Table 2).

There was no significant difference between groups based on the frequency of having prolapse and prolapse condition after 2 and 6 months ($P > 0.05$). After 2 and 6 months, the mean severity of anterior and posterior wall prolapse in the vaginal delivery group was considerably higher in the cesarean section group ($P < 0.05$). But there was no significant difference

Table 1: Demographics of patients in both groups

Variables	Vaginal delivery	Cesarean section	P value*
Age	26.63±3.78	26.21±5.46	0.69
BMI	25.92±1.99	26.71±3.30	0.21
NBW	3135.10±235.62	3126.31±335.65	0.89

*Independent t-test; BMI: Body Mass Index; NBW: New Born Weight

Table 2: Variable of study between two groups after 2 and 6 months

Variables		Vaginal delivery	Cesarean section	P value
Perineometry power	2 m	8.39±1.77	11.15±1.76	0.001>*
	6 m	8.97±1.46	11.13±1.27	0.001>*
	P**	0.05	0.06	
PFDI-20	2 m	7.89±1.39	5.13±2.90	0.001>*
	6 m	3.39±1.26	2.89±1.13	0.07*
	P**	0.001>	0.001>	
FSFI	2 m	11.55±1.96	23.84±3.88	0.001>*
	6 m	28.92±2.22	29.89±3.21	0.12*
	P**	0.001>	0.001>	

*Independent t-test, **Paired samples test, PFDI-20: pelvic floor distress questionnaire, FSFI: female sexual function index

Table 3: Comparison of types of prolapse between two groups after 2 and 6 months

Variables			Vaginal delivery	Cesarean section	P value	
Having Prolapse	2 m		35 (92.1%)	33 (86.8%)	0.35***	
	6 m		35 (92.1%)	34 (89.5%)	0.50***	
Prolapse condition	2 m	Posterior wall prolapse	2 (5.7%)	1 (2.9%)	0.67***	
		Anterior+ posterior prolapse	4 (11.4%)	6 (17.6%)		
		All types of prolapse	29 (82.9%)	27 (79.4%)		
	6 m	Posterior wall prolapse	2 (5.7%)	1 (3%)	0.71***	
		Anterior and posterior prolapse	10 (28.6%)	12 (36.4%)		
		All types of prolapse	23 (65.7%)	20 (60.6%)		
Prolapse intensity of Ant. wall (distance from hymen the zero point)	2 m	Grade2	-0.40±0.55	-1.22±0.75	Grade1	0.001>*
			6 m	Grade2		
		p**			0.20	0.10
	2 m	Grade2	-0.27±0.51	-1.25±0.76	Grade1	0.001>*
			6 m	Grade2		
		p**			0.33	0.34
Prolapse intensity of uterus (Apex)	2 m	Grade1	-4.71±2.26	-5.64±1.79	Grade1	0.07*
	6 m	Grade1	-5.21±2.01	5.34±2.43	Grade1	0.82*
		p**	0.25	0.40		

*Independent t-test, **Paired samples test, ***Chi Square

between groups based on prolapse severity of uterus after 2 and 6 months ($P>0.05$). Also, changing of prolapse intensity of the Anterior and posterior wall and uterus after 6 months compared to 2 months was not significant in both groups ($P>0.05$) (Table 3).

Discussion

According to our study, there was no significant difference between prolapse prevalence and its types in two groups of vaginal delivery and cesarean section, but the rate of perineometer power in the cesarean section was significantly higher than normal delivery. Grade of Anterior and posterior wall prolapse were also significantly higher in patients undergoing vaginal delivery than in cesarean section.

Also, based on the PFDI, pelvic floor muscle disorder was worsened in the vaginal group than in the cesarean section group for up to two months. In a similar study in Iran after examining 341 women, it was observed that pelvic floor muscle strength was highest in non-pregnant women and women with vaginal delivery with episiotomy as its lowest.¹⁵

In our study, most of the symptoms of pelvic floor disorder were related to urinary tract disorder. This finding is compatible with a study that showed the prevalence of urinary incontinence in 1, 6, and 12 months after vaginal delivery was significantly higher than in cesarean section and Operative vaginal delivery and episiotomy were determined as the risk factors of postpartum SUI in vaginal delivery.¹⁶ In contrast, another study in Lahore showed the prevalence of pelvic visceral prolapse was higher than urinary and fecal incontinence.¹⁷ Also in another study, the prevalence of urinary incontinence was equal in both cesarean section and vaginal delivery groups and did not differ significantly that was not matched in our study.¹⁸

In addition, based on the FSFI score female sexual function in patients undergoing cesarean section group was better than the vaginal patient group for up to two months. But there was no difference between the two groups in symptoms of pelvic floor dysfunction and female sexual function after 6 months. In the previous study they were matched, there was no significant difference between the sexual performance and postpartum problems of women in two groups: vaginal delivery and cesarean section¹⁹⁻²¹ and it was in contrast with another study, which they found the rate of sexual satisfaction of mothers' spouses was significantly different between the vaginal delivery and cesarean section group, and the rate of sexual satisfaction of spouses in the cesarean section group was higher.²²

Conclusion

In conclusion of the information of this study, because prolapse of pelvic organs was found in both vaginal and cesarean delivery groups with a high percentage and without significant differences, pelvic organ prolapses and some of its complications can be attributed to the general role of pregnancy and pelvic anatomy changes during pregnancy.

However, the results of this study showed that the vaginal delivery group had a higher prolapse severity, the pelvic floor muscle power was lower than the cesarean section group, and the symptoms of prolapse, especially urinary symptoms, and sexual dysfunction in vaginal delivery was more prevalent than the cesarean section in the second month after delivery. The results of the study showed that symptoms of prolapse and sexual function improved significantly after 6 months, and the results were the same in both groups after 6 months.

From this study, it can be concluded that similar to other studies vaginal delivery can be more effective in pelvic floor disorders than cesarean section. But the main concern of most women for avoiding vaginal delivery was sexual dysfunction and disorders in urination and defecation, considering the result of this study, we can reassure these primiparous women of society, that if they have a complication-free vaginal delivery, overtime their quality of life will return to normal and there is no need to have an elective cesarean section for preventing these disorders.

However, the limitation of this study was the low sample size, short research time and we could not evaluate many influential factors such as exercise and physical activity, diets, and lifestyle of people in this study, so there is still a need for further researches on this issue.

Conflict of Interest: None declared.

References

- Nygaard I, Barber MD, Burgio KL, Kenton K, Meikle S, Schaffer J, et al. Prevalence of symptomatic pelvic floor disorders in US women. *Jama*. 2008;300(11):1311-6. doi: 10.1001/jama.300.11.1311.
- Akhlaghi F. The prevalence of pelvic floor disorders in women that referred to the clinic of gynecology in Zeinab hospital, Mashhad, Iran, 2003. 2004. doi: 10.1016/j.ajog.2017.11.604
- Sung VW, Washington B, Raker CA. Costs of ambulatory care related to female pelvic floor disorders in the United States. *American journal of obstetrics and gynecology*. 2010;202(5):483. e1- e4. doi: 10.1016/j.ajog.2010.01.015
- Fornell EU, Wingren G, KjØlhede P. Factors associated with pelvic floor dysfunction with emphasis on urinary and fecal incontinence and genital prolapse: an epidemiological study. *Acta obstetrica et gynecologica Scandinavica*. 2004;83(4):383-9. doi: 10.1080/j.0001-6349.2004.00367.x
- Gyhagen M, Åkervall S, Milsom I. Clustering of pelvic floor disorders 20 years after one vaginal or one cesarean birth. *International urogynecology journal*. 2015;26(8):1115-21. doi: 10.1007/s00192-015-2663-3. doi: 10.1007/s00192-015-2663-3
- Azami-Aghdash S, Ghojazadeh M, Dehdilani N, Mohammadi M. Prevalence and causes of cesarean section in Iran: systematic review and meta-analysis. *Iranian journal of public health*. 2014;43(5):545. PMID: 26060756; PMCID: PMC4449402.
- Faisal I, Matinnia N, Hejar A, Khodakarami Z. Why do primigravidae request caesarean section in a normal pregnancy? A qualitative study in Iran. *Midwifery*. 2014;30(2):227-33. doi: 10.1016/j.midw.2013.08.011
- MacArthur C, Wilson D, Herbison P, Lancashire R, Hagen S, Toozs-Hobson P, et al. Urinary incontinence persisting after childbirth: extent, delivery history, and effects in a 12-year longitudinal cohort study. *BJOG: An International Journal of Obstetrics & Gynaecology*. 2016;123(6):1022-9. doi: 10.1111/1471-0528.13395
- Persu C, Chapple C, Cauni V, Gutue S, Geavlete P. Pelvic Organ Prolapse Quantification System (POP-Q)—a new era in pelvic prolapse staging. *Journal of medicine and life*. 2011;4(1):75. PMID: 21505577; PMCID: PMC3056425
- Weber A, Abrams P, Brubaker L, Cundiff G, Davis G, Dmochowski R, et al. The standardization of terminology for researchers in female pelvic floor disorders. *International urogynecology journal*. 2001;12(3):178-86. doi: https://doi.org/10.1007/PL00004033
- Pourmomeny A, Alebouyeh S, Torkzadeh A. Quantitative and Qualitative Tools in Studies on Pelvic Floor Muscle Rehabilitation. *Journal of Research in Rehabilitation Sciences*. 2017;12(5):306-17. doi: 10.1016/j.clinbiomech.2016.11.003. PMID: 27886590.
- Hakimi S, Hajebrahimi S, Bastani P, Aminian E, Ghana S, Mohammadi M. 208: translation and validation of the pelvic floor distress inventory short form (PFDI-20), Iranian version. *BMJ open*. 2017;7(Suppl 1):bmjopen-2016-015415.208. doi: 10.1136/bmjopen-2016-015415.208
- Rosen CB, J. Heiman, S. Leiblum, C. Meston, R. Shabsigh, D. Ferguson, R. D'Agostino, R. The Female Sexual Function Index (FSFI): a multidimensional self-report instrument for the assessment of female sexual function. *Journal of sex & marital therapy*. 2000;26(2):191-208. doi: 10.1080/009262300278597. PMID: 10782451.
- Mohammadi K, HEYDARI M, Faghihzadeh S. The female sexual function index (FSFI): validation of the Iranian version. 2008. doi:10.1186/s12905-019-0755-9. PMID: 31039769.
- Afshari P, Dabagh F, Irvani M, Abedi P. Comparison of pelvic floor muscle strength in nulliparous women and those with normal vaginal delivery and cesarean section. *International urogynecology journal*. 2017;28(8):1171-5. doi: 10.1007/s00192-016-3239-6
- Kokabi R, Yazdanpanah D. Effects of delivery mode and sociodemographic factors on postpartum stress urinary incontinency in primipara women: A prospective cohort study. *Journal of the Chinese Medical Association*. 2017;80(8):498-502. doi: 10.1016/j.jcma.2016.06.008
- Noor R, Neelam H, Bashir MS. Mode of delivery and pelvic floor disorder. *Rawal Medical Journal*. 2017;42(4):503-6. doi: 10.1016/j.tjog.2014.08.001. PMID: 25510682.
- Basirat Z, Bakhtiari A, Payandeh P. Postpartum stress urinary incontinence and some related factors. *Journal of Babol University of Medical Sciences*. 2008;10(5):41-7. doi: 10.1016/j.ejogrb.2019.10.020
- El-Sayed HAE, Ramadan S, Ibrahim H, Moursi HAA.

