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Risk factors of pelvic organ prolapse in Iranian women: a cross-sectional study

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ABSTRACT

Background and aims: Pelvic organ prolapse (POP) is a common condition which affects on a large proportion of women. The objective of this study was to determine the risk factors of POP in Iranian women.

Methods: This cross-sectional study was carried out to examine the role of demographic, anthropometric and clinical characteristics in POP disease in a sample of 365 females in Ilam, Iran. Examinations were performed according to Pelvic Organ Prolapse Quantification (POPQ) technique in dorsal lithotomic position. Then, the sample divided into two groups as with and without prolapse. Then, unilabiate and multivariate analyses were performed.

Results: Totally, 365 women participated in this study. The prevalence of POP was 80.8%. Univariate logistic regression analysis showed a significant differences between groups with and without POP based on age, maximum birth weight, BMI, pregnancy, delivery mode, delivery operative and delivery position. But after multivariate analysis, the most significant factors identified as risk factors for POP were age (OR= 1.12, 95% CI= 1.02-1.23, P= 0.02), normal vaginal delivery (NVD; OR= 6.18, 95% CI= 1.43-26.75, P= 0.01) and episiotomy (OR= 30, 95% CI= 5.69-158.11, P= 0.000).

Conclusion: Findings of the study showed that several risk factors could collaborate in creating of POP. However; body mass index and number of pregnancies are modifiable factors. So, maternal care providers should educate women for maintaining the ideal weight and decreasing the number of pregnancy in order to prevent POP.

Keywords: Ilam, Multivariate analysis, Pelvic organ prolapse, Univariate analysis.

INTRODUCTION

Pelvic organ prolapse (POP) is a common condition which can affect on a large proportion of women; in fact, its prevalence has been reported about 39.8% [1] and 49%.[2] Another study in China, reported the percentage of POP as 25% in female participants aged more than 60 years.[3]

The POP risk factors include aging, vaginal delivery, trauma during delivery, increasing chronic intra-abdominal pressure conditions such as obesity, chronic constipation, chronic coughing, and repetitive heavy lifting, menopause, estrogen deficiency, genetic factors, smoking, prior

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surgery, myopathy and collagen abnormalities.[4] POP is more common after the childbirth and menopause.[5]

The previous studies recognized parity as an important risk factor for development of POP.[6] However, it is not known whether POP is attributed to parity or pregnancy itself. Some studies reported an associate prolapse with pelvic floor injury sustained during vaginal delivery and suggested cesarean delivery as a preventive factor decreasing the risk of POP.[7] In a study, it has been shown that promoted life expectancy and the aging could increase the rate of urogenital prolapse, especially since the majority of women may spend one third of their lives in the postmenopausal state.[8]

Based on our knowledge, there is no adequate research to determine the prevalence and predisposing factors of the POP in Iran. So, this study was conducted to determine the risk factors of POP and the relationship between these risk factors and POP. Determining the factors can help to maternal care providers in order to prevent POP.

METHODS

This cross-sectional study was performed to examine the role of demographic, anthropometric and clinical variables in POP among women attending two public centres in Ilam province, Iran. All women participated in the research except for single, pregnant, lactate and women receiving hormone replacement therapy. Totally, in this study, 365 women participated. Data were collected and examinations were carried out in face to face interviews. The information had three parts:

1. Demographic information: Data on age, education, and occupation included.

2. Anthropometrics data: Information on weight and height were collected. Personnel measured the height and weight by a Seca 220 (made by Germany), while the participants were minimally clothed and not worn shoes. The body mass index was computed via this formula [BMI = weight (kg)/ height $(m)^2$]. Based on the BMI, as recommended by the National Centre for Education in Maternal and Child Health, women were grouped into different categories.[9]

3. Clinical measures: The summary of the patient's obstetrical included data on pregnancy, delivery mode, delivery operative, delivery position, maximum birth weight (MBW), medical and surgical histories and POP type and stage collected with observation, interview, and examination.

According to the Pelvic Organ Prolapse Quantification (POP-Q) technique, dorsal lithotomy position was evaluated in all subjects after emptying their bladders. Stages and position of prolapse were detected using the standardized system of the International Continence Society.[10] In this system, sizes are made at different vaginal sites, providing eligible for prolapse affecting different vaginal segments (anterior and posterior vagina, vaginal apex or cervix) as well as a whole stage of prolapse. Sizes are measured in centimetres compared to the hymen as the reference point. In this system, negative numbers represent positions above the hymen, and positive numbers represent points beyond or past the hymen. A rigid marked hysterometer, calibrated in centimeteres was used for measurements. In addition, the small vaginal dilator was used to measure Aa, Ba, Ap, Bp. The apical points of C, D and the Total Vaginal Length (TVL) points were measured relative to the hymen. All points except for TVL were recorded in maximal valsalva effort. The external measurements of Genital Hiatus (GH) and Barometric Pressure (PB) created at the time of rest and with strain. Then, bimanual examination for determine abdominal and

pelvic mass were performed. Patients were divided into two groups for comparison: (1) with prolapse (2) without prolapse. To indicate the association between dependent (with prolapse vs. without prolapse) and independent variables, both univariate and multiple logistic regression analyses were used. Independent variables tested for an association were age, education, occupation, body mass index, pregnancy, delivery mode, delivery operative, delivery position, and maximum birth weight. In this study, the Ethics Committee of Ilam University of Medical Sciences approved the study plan. After comprehensive explanation of the procedures involved, written informed consent was obtained from the participants.

RESULTS

Totally, 365 women participated in the vaginal examination. Since this study developed for assessing the pregnancy-related variables, 23 women excluded from analysis. Those women had not pregnancy yet. The mean age of participants was 36±9 years.

The results obtained from univariate logistic regression analysis indicated that there were significant differences in age, occupation, maximum birth weight, BMI, pregnancy, delivery mode, delivery operative and delivery position between women with and without prolapse. The results are shown in Table 1.

Table 1: The results obtained from univariate logistic regression analysis for Prolapse

Variables	With prolapse (Number=279)	Without prolapse (Number=63)	OR (95% CI)	P-value
Age (Year)	37.82 (8.94)**	32.76 (7.29)**	1.08 (1.04-1.13)	<0.001
Education				
College	20 (7.2)*	12 (19)*	1.0 (ref.)	
High school	70 (25.1)*	19 (30.2)*	2.21 (0.92-5.31)	0.076
Primary school	90 (32.3)*	11 (17.5)*	4.91 (1.90-12.70)	0.001
Illiterate	99 (35.5)*	21 (33.3)*	2.83 (1.20-6.66)	0.017
Occupation				
Official	20 (7.2)*	10 (15.9)*	1.0 (ref.)	
Unofficial	105 (37.6)*	7 (11.1)*	7.5 (2.55-22.04)	<0.001
Home worker	154 (55.2)*	46 (73)*	1.67 (0.73-3.83)	0.222
MBW (g)	3491 (2100-6000)	3444 (2800-5000)	1.001 (1-1.001)	0.05
BMI (kg/m^2)				
<=19.79	4(1.4)*	5(7.9)*	1.0 (ref.)	
19.8-24.99	51(18.3)*	17(27)*	3.75(0.90-15.59)	0.07
25-28.99	108(38.7)*	24(38.1)*	5.62(1.40-22.52)	0.01
29-34.99	78(28)*	12(19)*	8.12(1.91-34.58)	0.00
>=35	38(13.6)*	5(7.9)*	9.50(1.89-47.61)	0.01
Pregnancy				
1	26(9.3)*	17(27)*	1.0 (ref.)	
2-5	126(45.2)*	33(52.4)*	2.50(1.21-5.14)	0.01
>5	127(45.5)*	13(20.6)*	6.39(2.77-14.74)	<0.001
Delivery mode				
Cesarean	18(6.5)*	23(37.1)*	1.0 (ref.)	
NVD	150(53.8)*	18(29)*	10.65(4.85-23.39)	<0.001
Episiotomy	35(12.5)*	2(3.2)*	22.36(4.73-105.64)	<0.001
NVD+Epi	40(14.3)*	9(14.5)*	5.68(2.19-4.69)	<0.001
Mix	36(12.9)*	10(16.1)*	4.60(1.81-11.70)	<0.001
Delivery operative				
Midwife	117(41.9)*	16(25.4)*	1.0 (ref.)	
Obstetrician	20(7.2)**	24(38.1)*	0.11(0.05-0.25)	<0.001
Traditional midwife	102(36.6)	7(11.1)*	1.99(0.79-5.03)	0.14
Mix	40(14.3)*	16(25.4)*	0.34(0.16-0.75)	0.01
Place of delivery				
Hospital	131(47)*	51(81)*	1.0 (ref.)	
Home	102(36.6)*	7(11.1)*	5.67(2.47-13.03)	<0.001
Both	46(16.5)*	5(7.9)*	3.58(1.35-9.52)	0.01

*CI: Confidence Interval; *Number (%);***Mean (SD).*

However, when forward conditional based on multiple logistic regression analysis was performed, the results showed that age, normal vaginal delivery and Episiotomy emerged as significant factors for increased risk of prolapse (Table 2).

Table 2: Logistic regression analysis of factors associated with having prolapse

Variable	Adjusted OR* (95% CI)	P-value
Age (Year)	1.12 (1.02-1.23)**	0.02
Delivery mode		<0.001
Cesarean	1(Ref.)	
NVD	6.18 (1.43-26.75)	0.01
Episiotomy	30.00 (5.69-158.11)	<0.001
NVD +Epi	2.44 (0.70-8.53)	0.16
Mix	1.25 (0.33-4.69)	0.74

*CI: Confidence Interval;*Adjusted for Occupation, Maximum Birth Weight, Body Mass Index, Pregnancy and Delivery operative;* **Mean (SD).

DISCUSSION

This study carried out to examine the association between POP and demographic, anthropometric and clinical measures. The association between age and POP is well-known.[11] In this study, age increased the risk of pelvic organ prolapse to 1.1 times after adjustment for maximum birth weight, body mass index, pregnancy and delivery operative.

A study on 27342 women showed that all sites of POP had a higher rate among older women.[12] Kim et al in another study, concluded that age more than 70 years is a predicting factor for the POP[1]. This issue was also supported by other studies.[13-15] However, Nygaard et al in a study has shown that the adverse result (OR= 0.50, 95% CI= 0.27-0.92). [16]

Pregnancy and vaginal delivery are other risk factors for the development of pelvic organ prolapse. This study showed that the risk of POP in women with 5 pregnancies or more had increased 6 times in comparison with women who had only 1 pregnancy. This result was supported by the study conducted in Britain.[17] After adjustment for maximum birth weight, body mass index, pregnancy and delivery operative, the risk of POP increased to 6 times in normal vaginal delivery and 30 times in Episiotomy versus caesarean section, in our study. This finding was supported by other studies demonstrated that normal vaginal delivery caused by the damage to the nerves, fascia, and muscles of the pelvic floor and developed the pelvic organ prolapse.[15]

There is a controversy about this idea which delivery or pregnancy is a contributor factor for pelvic organ prolapse. [15, 17] During pregnancy the weight of the fetus and the gravid uterus produce anatomical changes to the bladder and urethra. Previous research using ultrasound imaging techniques has shown that the angle between the bladder neck and the urethra increases. This and the increased mobility of the bladder due to the hormonal changes cause the urinary incontinence as seen during pregnancy. In addition, due to the changes in collagen and other connective tissues during pregnancy, anal incontinence can occur regardless of delivery mode.[18] On the other hand, several studies have shown that the main factor in the causation of prolapse is vaginal childbirth.[19] Dietz purposed that up to one third of women following vaginal delivery experienced descent of the fascia supporting

the pelvic floor muscles. The descent was associated with postpartum stress urinary incontinence three months following delivery.[20]

Present study showed that the risk of POP could increase in deliveries performed at home. This supported by other studies too.[15, 21] Moreover, in this study, deliveries conducted by traditional midwife equal to the deliveries performed at home and the risk of POP in this population was more in comparison with the reference category. Considering to the role of traditional midwives in Iran and the obtained result relating to the more risk of POP in deliveries conducted by traditional midwife, it seems that training traditional midwives in this regard is necessary.

CONCLUSION

Finding of the study showed several effective factors in creation of POP. However, it seems that among those, body mass index and number of pregnancies are modifiable factors. So, maternal care providers can educate the women for maintenance ideal weight and decrease the number of pregnancy in order to preventing POP.

CONFLICT OF INTEREST

The authors declare that they have no conflict of interests.

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REFERENCES

1. Kim CM, Jeon MJ, Chung DJ, Kim SK, Kim JW, Bai SW. Risk factors for pelvic organ prolapse. Int J Gynaecol Obstet. 2007; 98(3):248–51.
2. Norton P, Brubaker L, Nager CW, Lemack GE, Zyczynski HM, Sirls L, et al. Pelvic organ prolapse in a cohort of women treated for stress urinary incontinence. Am J Obstet Gynecol. Jul 31.
3. Zhou Y, Ling O, Bo L. Expression and significance of lysyl oxidase-like 1 and fibulin-5 in the cardinal ligament tissue of patients with pelvic floor dysfunction. J Biomed Res. 2013; 27(1):23-8.
4. Schaffer JI, Wai CY, Boreham MK. Etiology of pelvic organ prolapse. Clin Obstet Gynecol. 2005; 48(3):639-47.
5. Ismail SI, Bain C, Hagen S. Oestrogens for treatment or prevention of pelvic organ prolapse in postmenopausal women. Cochrane Database Syst Rev. 2010; (9): CD007063.
6. Handa VL, Garrett E, Hendrix S, Gold E, Robbins J. Progression and remission of pelvic organ prolapse: a longitudinal study of menopausal women. Am J Obstet Gynecol. 2004; 190(1):27-32.
7. Hodroff MA, Stolpen AH, Denson MA, Bolinger L, Kreder KJ. Dynamic magnetic resonance imaging of the female pelvis: the relationship with the Pelvic Organ Prolapse quantification staging system. J Urol. 2002; 167(3): 1353-5.
8. Srikrishna S, Robinson D, Cardozo L, Cartwright R. Experiences and expectations of women with urogenital prolapse: a quantitative and qualitative exploration. BJOG. 2008; 115(11):1362-8.
9. Suitor C. Maternal weight gain: A report of an expert work group. 1997 ed. Arlington, VA: National Center for Education in Maternal and Child Health; 1997.
10. Bump RC, Norton PA. Epidemiology and natural history of pelvic floor

dysfunction. Obstet Gynaecol Clin North Am. 1998; 25(4):723–46.
11. Dietz HP. The aetiology of prolapse. Int Urogynaecol J Pelvic Floor Dysfunct. 2008; 19(10):1323–9.
12. Hendrix SL, Clark A, Nygaard I, Aragaki A, Barnabei V, McTiernan A. Pelvic organ prolapse in the Women's Health Initiative: gravity and gravidity. Am J Obstet Gynecol. 2002 Jun; 186(6):1160-6.
13. Lemack GE, Xu Y, Brubaker L, Nager C, Chai T, Moalli P, et al. Clinical and demographic factors associated with valsalva leak point pressure among women undergoing burch bladder neck suspension or autologous rectus fascial sling procedures. Neurourol Urodyn. 2007; 26(3):392-6.
14. Swift S, Woodman P, O'Boyle A, Kahn M, Valley M, Bland D, et al. Pelvic Organ Support Study (POSST): the distribution, clinical definition, and epidemiologic condition of pelvic organ support defects. Am J Obstet Gynecol. 2005; 192(3):795-806.
15. Garshasbi A, Faghih-Zadeh S, Falah N. The status of pelvic supporting organs in a population of Iranian women 18 - 68 years of age and possible related factors. Arch Iran Med. 2006; 9(2):124–8.
16. Nygaard I, Bradley C, Brandt D. Pelvic organ prolapses in older women: prevalence and risk factors. Obstet Gynaecol. 2004; 104(3):489–97.
17. Mant J, Painter R, Vessey M. Epidemiology of genital prolapse: observations from the Oxford Family Planning Association Study. Br J Obstet Gynaecol. 1997; 104(5):579-85.
18. Herbert J. Pregnancy and childbirth: the effects on pelvic floor muscles. Nurs Times. 2009; 105(7):38-41.
19. Patel DA, Xu X, Thomason AD, Ransom SB, Ivy JS, DeLancey JO. Childbirth and pelvic floor dysfunction: an epidemiologic approach to the assessment of prevention opportunities at delivery. Am J Obstet Gynaecol. 2006; 195(1):23-8.
20. Dietz HP, Lanzarone V. Levator trauma after vaginal delivery. Obstet Gynecol. 2005; 106(4):707-12.
21. Gurel H, Gurel SA. Pelvic relaxation and associated risk factors: the results of logistic regression analysis. Acta Obstet Gynecol Scand. 1999; 78(4):290-3.

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