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Risk Factors Associated With Pelvic Organ Prolapse In Women Of Reproductive And Perimenopausal Age

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Abstract: Pelvic organ prolapse (POP) is a common condition that significantly affects women's quality of life. This study aimed to identify the main risk factors associated with POP through clinical and anamnestic analysis. A total of 130 women were examined, including 90 patients with prolapse symptoms and 40 healthy controls. The analysis demonstrated that heavy physical labor, obesity, high parity, short interpregnancy intervals, early age at first delivery, complicated vaginal deliveries, and increased fetal birth weight were significantly associated with POP development. Chronic respiratory diseases, connective tissue disorders, varicose veins, and hernia were also more prevalent among women with prolapse. Logistic regression analysis indicated that fetal birth weight greater than 3500 g was an important predictor of prolapse. Early identification of these risk factors may contribute to improved prevention, timely diagnosis, and reduction of disease progression.

Keywords: pelvic organ prolapse, risk factors, obesity, parity, childbirth complications, fetal birth weight, pelvic floor dysfunction.

Introduction

Pelvic organ prolapse (POP) is a common gynecological disorder characterized by the descent of one or more pelvic organs, including the uterus, bladder, rectum, or vaginal apex, due to weakening of the pelvic floor support structures [1]. The condition is considered one of the most significant health problems affecting women worldwide because of its high prevalence and substantial impact on physical, psychological, social, and sexual well-being [2]. Women with pelvic organ prolapse frequently experience symptoms such as a sensation of vaginal bulging, pelvic pressure, urinary dysfunction, bowel disorders, dyspareunia, and reduced quality of life [3].

The prevalence of pelvic organ prolapse varies depending on diagnostic criteria and study population. Epidemiological studies indicate that up to 50% of parous women demonstrate some degree of pelvic organ support defects during clinical examination, while symptomatic prolapse occurs in approximately 3–12% of women [4], [5]. The incidence of the disease increases with age, particularly during the perimenopausal and postmenopausal periods, owing to hormonal changes and progressive weakening of connective tissue structures [6]. According to international reports, the lifetime risk of undergoing surgical treatment for pelvic organ prolapse or urinary incontinence reaches 11–20%, highlighting the considerable burden of pelvic floor disorders on healthcare systems worldwide [7].

The pathogenesis of pelvic organ prolapse is multifactorial and involves complex interactions between genetic predisposition, connective tissue integrity, neuromuscular function, and environmental factors [8]. Damage to the pelvic floor muscles, ligaments, and fascial structures may occur during pregnancy and childbirth, leading to a gradual loss of pelvic organ support [9]. In addition, age-related degenerative changes, alterations in collagen metabolism, and estrogen deficiency contribute to the progression of pelvic floor dysfunction [10].

Among the numerous risk factors identified in previous studies, vaginal childbirth remains the most consistently reported determinant of pelvic organ prolapse development [11]. Repeated pregnancies and deliveries may cause stretching, denervation, and injury of the levator ani muscle

complex, resulting in long-term impairment of pelvic floor support [12]. Several investigators have demonstrated that women with multiple vaginal deliveries are at significantly greater risk of developing prolapse than nulliparous women or those delivered exclusively by cesarean section [13].

Obstetric factors such as prolonged labor, operative vaginal delivery, episiotomy, perineal trauma, cervical lacerations, and fetal macrosomia have also been associated with increased rates of pelvic floor dysfunction [14]. The delivery of a large fetus may substantially increase mechanical stress on the pelvic floor muscles and connective tissues, leading to irreversible structural damage [15]. Furthermore, early age at first childbirth and short interpregnancy intervals may prevent complete recovery of pelvic support structures between pregnancies and therefore increase the likelihood of prolapse development [16].

A growing body of evidence suggests that obesity is another important modifiable risk factor for pelvic organ prolapse [17]. Increased body mass index contributes to chronically elevated intra-abdominal pressure, which exerts continuous stress on the pelvic floor and accelerates the weakening of supporting tissues [18]. Several large population-based studies have reported a significantly higher prevalence of prolapse among overweight and obese women compared with women of normal weight [19].

In addition to reproductive and anthropometric factors, chronic medical conditions may also contribute to the development of pelvic organ prolapse. Chronic respiratory diseases accompanied by persistent coughing, constipation, heavy lifting, and occupations involving strenuous physical activity can increase intra-abdominal pressure and thereby promote pelvic floor weakening [20]. Connective tissue disorders, varicose veins, hernia diseases, and other manifestations of collagen deficiency have been increasingly recognized as important contributors to pelvic floor dysfunction [21]. These findings support the hypothesis that systemic connective tissue abnormalities may play a fundamental role in the pathophysiology of prolapse [22].

Although numerous studies have investigated the epidemiology and risk factors of pelvic organ prolapse, considerable differences remain between populations due to variations in reproductive behavior, lifestyle characteristics, socioeconomic conditions, and access to healthcare services [23]. Therefore, the identification of population-specific risk factors is essential for improving prevention programs, early diagnosis, and individualized management strategies.

The present study aimed to evaluate the clinical and anamnestic characteristics of women with pelvic organ prolapse and to determine the most significant risk factors associated with the development of the disease through comparative analysis of somatic, obstetric, gynecological, and anthropometric parameters.

Materials and Methods

A comparative clinical study was conducted at the Department of Obstetrics and Gynecology of Tashkent State Medical University. The study included 130 women aged 25–65 years who underwent clinical examination and assessment of pelvic floor disorders. The participants were divided into three groups. The main group consisted of 45 women diagnosed with pelvic organ prolapse accompanied by pronounced clinical symptoms. The comparison group included 45 women with pelvic organ prolapse manifestations of lesser severity. The control group comprised 40 practically healthy women without clinical signs of pelvic floor dysfunction. All participants underwent comprehensive clinical and anamnestic evaluation. Data collection included demographic characteristics, occupational history, somatic diseases, gynecological and obstetric history, reproductive characteristics, body mass index (BMI), parity, birth outcomes, and current complaints associated with pelvic floor dysfunction. Special attention was paid to the assessment of occupational factors, particularly heavy physical labor and activities associated with repetitive lifting of heavy loads. Somatic history included evaluation of obesity, anemia, hypertension, urinary tract diseases, chronic respiratory disorders, varicose veins, connective tissue diseases, and hernia. Gynecological history included menstrual and reproductive characteristics, inflammatory diseases of the genital tract, uterine fibroids, infertility, endometriosis, previous uterine curettage procedures, and other gynecological conditions. Obstetric characteristics analyzed during the study included age at first delivery, number of pregnancies and births, interpregnancy interval, mode of delivery, birth complications, and fetal birth weight. Particular attention was given to obstetric trauma, including episiotomy, perineal tears, cervical tears, vacuum

extraction, and labor abnormalities. Body mass index was calculated using the standard formula: BMI = Weight (kg) / Height² (m²)

Based on the obtained values, participants were categorized according to the World Health Organization classification of nutritional status. The frequency and severity of pelvic floor dysfunction symptoms were assessed through clinical interviews. The most frequently reported symptoms included vaginal discomfort, urinary frequency, stress urinary incontinence, pelvic pressure, and bowel dysfunction. Statistical analysis was performed using standard biomedical statistical methods. Quantitative variables were expressed as mean values with standard errors (M±m), while qualitative variables were presented as absolute numbers and percentages. The significance of differences between groups was assessed using Student's t-test and Pearson's chi-square (χ^2) test. The strength of association between potential risk factors and pelvic organ prolapse was evaluated by calculating odds ratios (OR) and relative risks (RR) with corresponding confidence intervals. Logistic regression analysis was performed to determine the predictive value of selected obstetric factors for the development of pelvic organ prolapse. Differences were considered statistically significant at $p<0.05$.

Results and discussions

A total of 130 women were enrolled in the study, including 45 patients in the main group, 45 patients in the comparison group, and 40 healthy women in the control group. The mean age of all participants was 43.2±0.96 years. The highest mean age was observed in the comparison group (43.7±1.58 years), followed by the main group (43.5±1.51 years) and the control group (42.1±1.57 years).

To evaluate the contribution of occupational activity to pelvic organ prolapse (POP), participants' employment histories were analyzed. Heavy physical labor was significantly more common among women with prolapse than among controls.

Table 1. Occupational Characteristics of the Examined Women (n, %)

Occupational Activity	Main Group (n=45)	Comparison Group (n=45)	Control Group (n=40)
Heavy physical labor	24 (53.3%)*	20 (44.4%)*	5 (12.5%)
No heavy physical labor	21 (46.7%)	25 (55.6%)	35 (87.5%)

*Differences compared with the control group were statistically significant ($p<0.001$).

OR (Main group vs Control group) = 6.15; RR = 4.9

OR (Comparison group vs Control group) = 4.75; RR = 4.0

The odds ratio analysis demonstrated that heavy physical labor was strongly associated with POP development. Compared with the control group, the risk was significantly higher in both the main group (OR=6.15; RR=4.9) and comparison group (OR=4.75; RR=4.0), indicating that chronic exposure to increased intra-abdominal pressure caused by strenuous physical activity may contribute substantially to pelvic floor dysfunction. The prevalence of somatic diseases is presented in Figure 1.

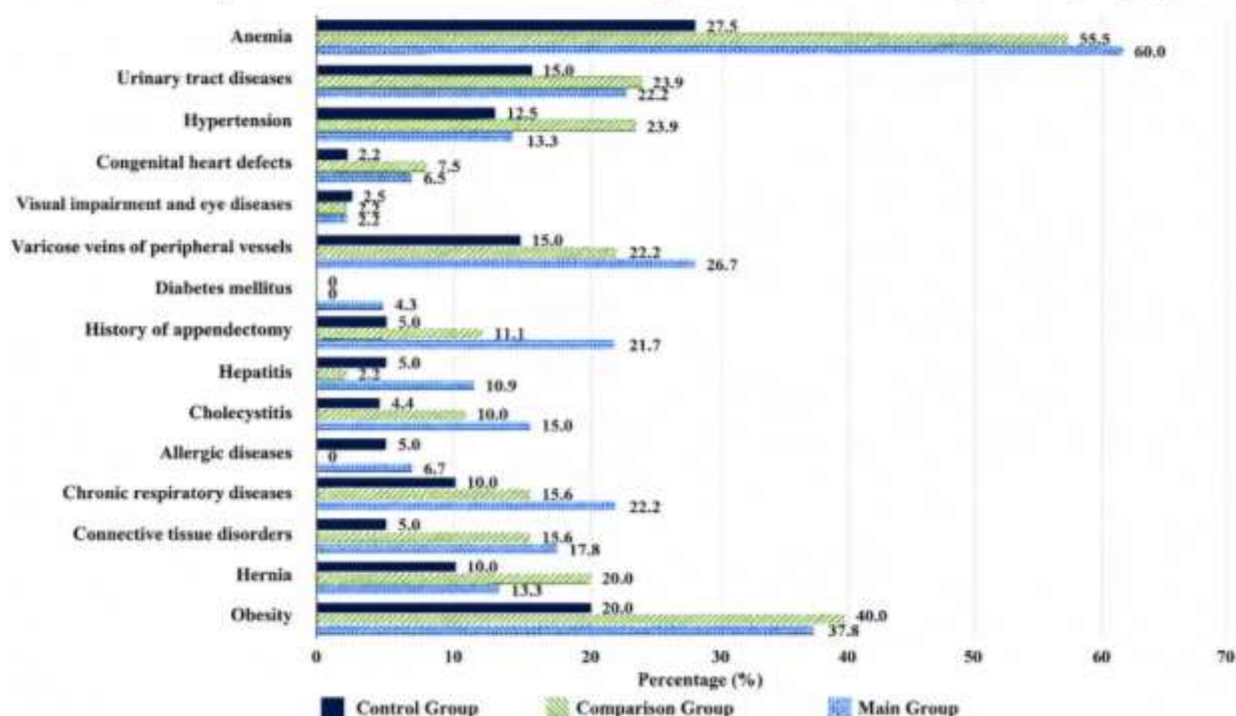

Figure 1. Analysis of somatic diseases

Anemia was the most frequently reported condition and was identified in 60.0% of women in the main group, 55.5% in the comparison group, and 27.5% in the control group. Obesity was detected in 37.8%, 40.0%, and 20.0% of women, respectively. Chronic respiratory diseases, connective tissue disorders, hernia, and varicose veins were significantly more common among women with prolapse ($p \leq 0.001$).

These findings support previous reports suggesting that connective tissue abnormalities and collagen metabolism disorders play an important role in the pathogenesis of POP. Women with a history of chronic respiratory diseases, varicose veins, hernia, and connective tissue disorders should therefore be considered a high-risk population.

Analysis of gynecological history revealed no statistically significant differences in age at menarche or age at sexual debut between the groups. However, uterine curettage procedures and uterine fibroids were more frequently observed among women with prolapse.

Table 2. Analysis of Gynecological History Among the Examined Women

Indicators	Main Group (n=45)	Comparison Group (n=45)	Control Group (n=40)
Age at menarche (years)	13.20±0.20	13.07±0.14	12.43±0.32
Age at sexual debut (years)	21.0±0.23	21.53±0.57	20.45±0.27
Manual vacuum aspiration, n (%)	12 (28.9)	13 (28.9)	16 (40.0)
Uterine curettage, n (%)	16 (20.0)	9 (20.0)	5 (12.5)
Miscarriage, n (%)	8 (22.2)	10 (22.2)	15 (37.5)
Ectopic pregnancy, n (%)	4 (2.2)	1 (2.2)	2 (5.0)
Ovarian cyst, n (%)	0	2 (4.4)	4 (10.0)
CIN (Cervical Intraepithelial Neoplasia), n (%)	0	1 (2.2)	1 (2.5)
Uterine fibroids, n (%)	6 (6.6)	3 (6.7)	3 (7.5)
Infertility, n (%)	3 (5.5)	2 (4.4)	2 (5.0)
Endometriosis, n (%)	1 (2.2)	1 (2.2)	0
Cervical and endometrial polyps, n (%)	0	0	2 (5.0)

Indicators	Main Group (n=45)	Comparison Group (n=45)	Control Group (n=40)
Bartholin gland cyst, n (%)	0	0	2 (5.0)
Inflammatory diseases of genital organs, n (%)	28 (51.0)	24 (53.3)	16 (40.0)
History of hysterectomy, n (%)	0	2 (4.4)	0

*Statistically significant differences compared with controls: p<0.05.

Inflammatory diseases of the genital tract were identified in 51.0% of women in the main group and 53.3% of women in the comparison group, compared with 40.0% in the control group. Body mass index analysis demonstrated significant differences among the groups. The highest BMI was observed in the comparison group (29.21±0.74 kg/m²), followed by the main group (28.99±0.55 kg/m²), whereas the control group showed significantly lower values (26.8±0.53 kg/m²; p<0.05).

Table 3. Body Mass Index Indicators in the Study Groups (kg/m²)

Groups	Mean ± SE	SD	Maximum/Minimum	p-value vs Control
Main Group	28.99±0.55	3.67	36/22	0.01
Comparison Group	29.21±0.74	4.97	41/21	0.005
Control Group	26.80±0.53	3.35	35/21	—

The distribution of obesity grades is shown in Figure 2.

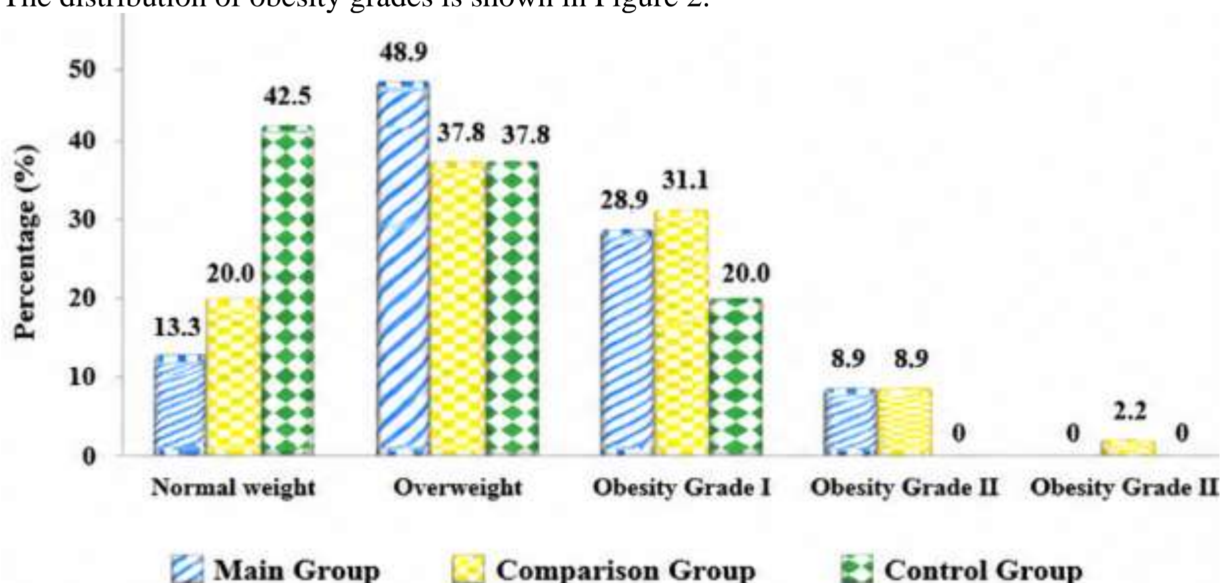

Figure 2. Distribution of overweight and obesity grades among the study gropus

Overweight and obesity (BMI ≥25 kg/m²) were present in 86.7% of women in the main group, 80.0% in the comparison group, and 57.5% of controls. Odds ratio analysis confirmed obesity as a significant risk factor for POP development (Table 4).

Table 4. Odds Ratio of Pelvic Organ Prolapse in Women with BMI ≥25 kg/m²

Variable	Main Group	Comparison Group	Control Group
BMI ≥25 kg/m²	39	36	23
Normal BMI	6	9	17
Odds Ratio (OR)	4.81	2.96	—

OR (Main group vs Control) = 4.81

OR (Comparison group vs Control) = 2.96

Parity analysis demonstrated that women with prolapse had significantly higher numbers of vaginal deliveries than controls.

Table 5. Parity Characteristics of Women Included in the Study

Variable	Main Group	χ^2	p	Comparison Group	χ^2	p	Control Group

	n (%)			n (%)			n (%)
1–2 deliveries	3 (6.67)	10.6	0.001	6 (13.3)	5.52	0.01	14 (35.0)
3–4 deliveries	20 (44.4)	3.60	0.05	27 (60.0)	0.23	0.63	26 (65.0)
≥5 deliveries	22 (48.9)	26.38	<0.001	12 (26.7)	12.42	<0.001	0
History of cesarean section	5 (11.1)	0	1.0	7 (15.6)	0.38	0.53	5 (12.5)
Obstetric complications	29 (64.4)	7.51	0.006	31 (68.9)	10.0	0.002	11 (27.5)

Five or more deliveries were observed in 48.9% of women in the main group and 26.7% in the comparison group, while no such cases were recorded in the control group. Women with three or more deliveries demonstrated a markedly increased risk of prolapse (OR=7.5 and OR=3.5, respectively). The frequency of obstetric complications is presented in Figure 3.

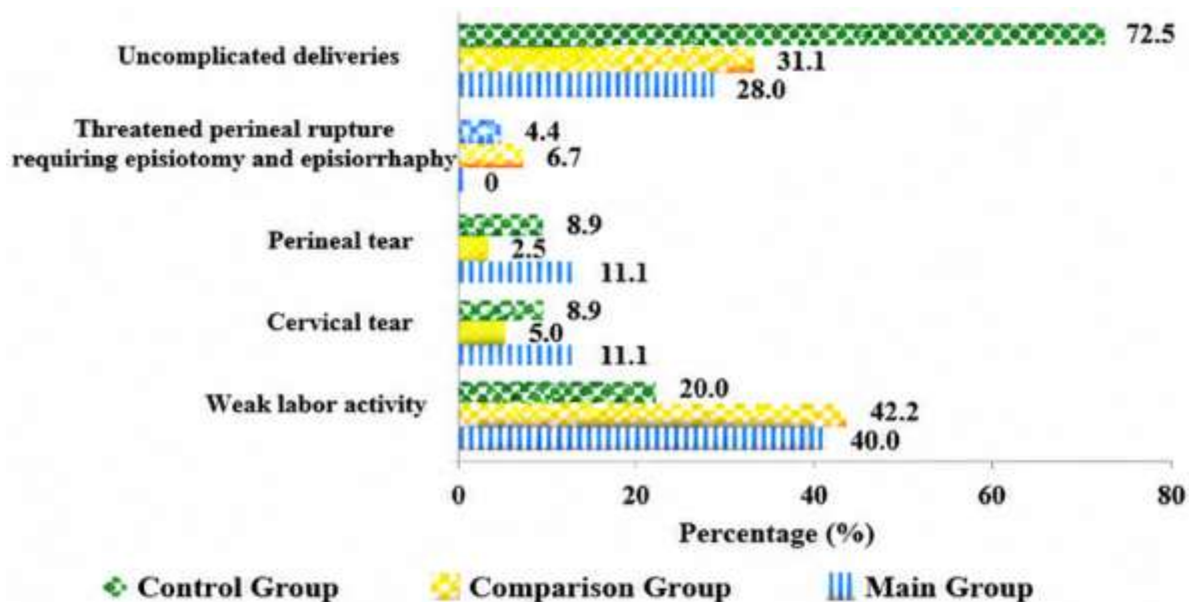

Figure 3. Analysis of obstetric complications during previous deliveries (%).

Episiotomy and episiorrhaphy performed because of threatened perineal rupture represented the most common complications. Women with a history of complicated deliveries had a 4–6-fold higher risk of developing pelvic organ prolapse than women whose deliveries were uncomplicated.
The mean age at first childbirth was significantly lower in women with prolapse than in controls.

Table 6. Age at First Childbirth

Group	n	Mean ± SE	SD	t	p
Main Group	45	20.4±0.18	1.18	4.91	0.001
Comparison Group	45	20.8±0.24	1.60	3.37	0.001
Control Group	40	22.1±0.31	1.96	—	—

The average age at first childbirth was 20.4±0.18 years in the main group, 20.8±0.24 years in the comparison group, and 22.1±0.31 years in controls (p≤0.001). Similarly, the interval between deliveries was significantly shorter among women with prolapse.

Table 7. Interpregnancy Interval Characteristics (years)

Group	n	Mean ± SE	SD	t	p	95% CI
Main Group	45	1.9±0.12	0.79	4.23	0.001	0.46–1.27
Comparison Group	45	2.1±0.12	0.81	3.27	0.002	0.27–1.09
Control Group	40	2.8±0.17	1.09	—	—	—

The average interpregnancy interval was 1.9±0.12 years in the main group and 2.1±0.12 years in the comparison group, compared with 2.8±0.17 years in the control group. The mean birth weight of newborns was significantly higher among women with prolapse. The distribution of neonatal birth weight is presented in Figure 4.

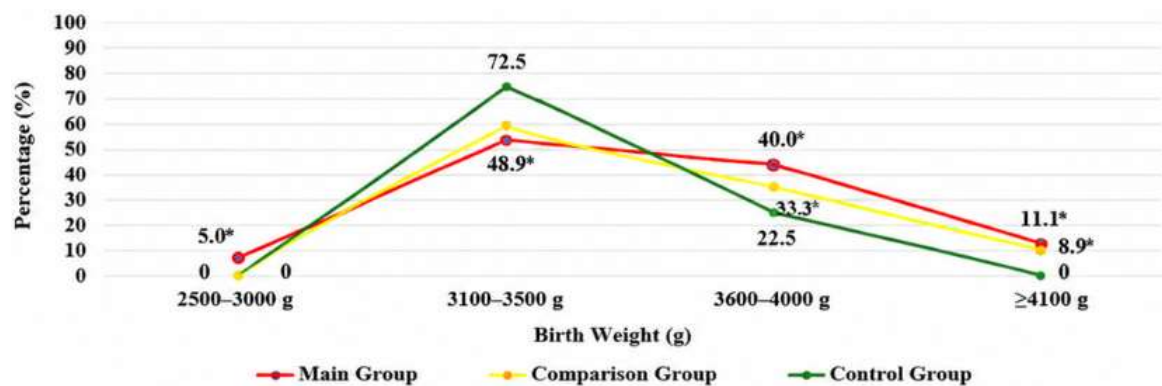

Figure 4. Neonatal birth weight distribution among study groups (%).

Women with prolapse more frequently delivered infants weighing over 3500 g. Logistic regression analysis demonstrated a sensitivity of 70.0% and specificity of 96.4% for fetal birth weight greater than 3500 g as a predictor of prolapse development.

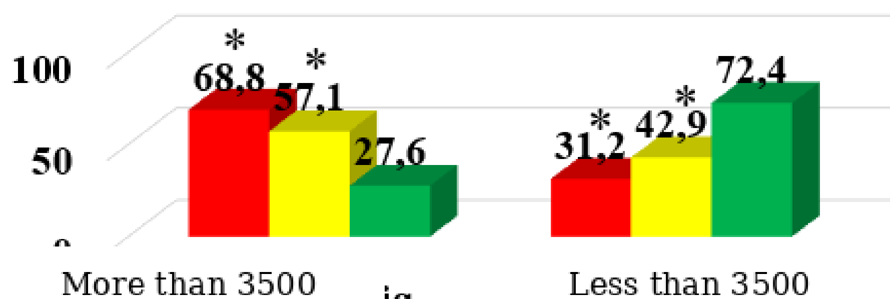

Figure 5. Logistic regression model predicting pelvic organ prolapse according to fetal birth weight.

Clinical symptom analysis demonstrated that dyspareunia, urinary frequency, stress urinary incontinence, and meteorism were the most prevalent complaints among women with prolapse.

Overall, the findings indicate that pelvic organ prolapse is a multifactorial disorder associated with obesity, heavy physical labor, connective tissue abnormalities, high parity, complicated deliveries, short interpregnancy intervals, younger age at first delivery, and increased fetal birth weight.

Conclusions

Pelvic organ prolapse is associated with multiple risk factors, including heavy physical labor, obesity, high parity, obstetric trauma, short interpregnancy intervals, and increased fetal birth weight. Women with connective tissue disorders, chronic respiratory diseases, varicose veins, and hernia also demonstrated a higher risk of prolapse development.

The study showed that fetal birth weight greater than 3500 g, repeated vaginal deliveries, and obesity were among the most significant predictors of pelvic organ prolapse. Early identification of these risk factors may improve preventive measures, facilitate timely diagnosis, and reduce disease progression.

References

[1] B. T. Haylen, C. F. Maher, M. D. Barber, S. Camargo, V. Dandolu, A. Digesu, et al., "An International Urogynecological Association (IUGA)/International Continence Society (ICS) joint report on the terminology for female pelvic floor dysfunction," *Neurourol. Urodyn.*, vol. 29, no. 1, pp. 4–20, 2010.

[2] M. D. Barber, "Pelvic organ prolapse," *BMJ*, vol. 354, p. i3853, 2016.

[3] J. E. Jelovsek, C. Maher, and M. D. Barber, "Pelvic organ prolapse," *Lancet*, vol. 369, no. 9566, pp. 1027–1038, 2007.
[4] S. L. Hendrix, A. Clark, I. Nygaard, A. Aragaki, V. Barnabei, and A. McTiernan, "Pelvic organ prolapse in the Women's Health Initiative: gravity and gravidity," *Am. J. Obstet. Gynecol.*, vol. 186, no. 6, pp. 1160–1166, 2002.
[5] I. Nygaard, M. D. Barber, K. L. Burgio, K. Kenton, S. Meikle, J. Schaffer, et al., "Prevalence of symptomatic pelvic floor disorders in US women," *JAMA*, vol. 300, no. 11, pp. 1311–1316, 2008.
[6] S. E. Swift, S. B. Tate, and J. Nichols, "Correlation of symptoms with degree of pelvic organ support in a general population of women," *Obstet. Gynecol.*, vol. 102, no. 4, pp. 731–738, 2003.
[7] A. L. Olsen, V. J. Smith, J. O. Bergstrom, J. C. Colling, and A. L. Clark, "Epidemiology of surgically managed pelvic organ prolapse and urinary incontinence," *Obstet. Gynecol.*, vol. 89, no. 4, pp. 501–506, 1997.
[8] T. F. M. Vergeldt, M. Weemhoff, J. IntHout, and K. B. Kluivers, "Risk factors for pelvic organ prolapse and its recurrence: a systematic review," *Int. Urogynecol. J.*, vol. 26, no. 11, pp. 1559–1573, 2015.
[9] J. O. L. DeLancey, "Anatomy and biomechanics of genital prolapse," *Clin. Obstet. Gynecol.*, vol. 36, no. 4, pp. 897–909, 1993.
[10] H. P. Dietz, "Pelvic floor trauma following vaginal delivery," *Curr. Opin. Obstet. Gynecol.*, vol. 18, no. 5, pp. 528–537, 2006.
[11] V. L. Handa, J. L. Blomquist, L. R. Knoepp, K. A. Hoskey, K. C. McDermott, and A. Muñoz, "Pelvic floor disorders 5–10 years after vaginal or cesarean childbirth," *Obstet. Gynecol.*, vol. 118, no. 4, pp. 777–784, 2011.
[12] J. O. L. DeLancey, D. M. Morgan, D. E. Fenner, R. Kearney, K. Guire, J. M. Miller, et al., "Comparison of levator ani muscle defects and function in women with and without pelvic organ prolapse," *Obstet. Gynecol.*, vol. 109, no. 2, pp. 295–302, 2007.
[13] J. Mant, R. Painter, and M. Vessey, "Epidemiology of genital prolapse: observations from the Oxford Family Planning Association Study," *Br. J. Obstet. Gynaecol.*, vol. 104, no. 5, pp. 579–585, 1997.
[14] A. H. MacLennan, A. W. Taylor, D. H. Wilson, and D. Wilson, "The prevalence of pelvic floor disorders and their relationship to gender, age, parity and mode of delivery," *BJOG*, vol. 107, no. 12, pp. 1460–1470, 2000.
[15] H. P. Dietz and V. Lanzarone, "Levator trauma after vaginal delivery," *Obstet. Gynecol.*, vol. 106, no. 4, pp. 707–712, 2005.
[16] M. Gyhagen, M. Bullarbo, T. F. Nielsen, and I. Milsom, "Prevalence and risk factors for pelvic organ prolapse 20 years after childbirth," *BJOG*, vol. 120, no. 2, pp. 152–160, 2013.
[17] B. I. Kudish, C. B. Iglesia, R. J. Sokol, B. Cochrane, H. E. Richter, J. Larson, et al., "Effect of weight change on natural history of pelvic organ prolapse," *Obstet. Gynecol.*, vol. 113, no. 1, pp. 81–88, 2009.
[18] E. L. Whitcomb, G. Rortveit, J. S. Brown, J. M. Creasman, D. H. Thom, S. K. Van Den Eeden, et al., "Racial differences in pelvic organ prolapse," *Obstet. Gynecol.*, vol. 114, no. 6, pp. 1271–1277, 2009.
[19] B. B. Washington, E. A. Erekson, and D. L. Myers, "The effect of obesity on pelvic floor disorders," *Curr. Opin. Obstet. Gynecol.*, vol. 22, no. 5, pp. 372–377, 2010.
[20] M. C. P. Slieker-ten Hove, A. L. Pool-Goudzwaard, M. J. C. Eijkemans, R. P. M. Steegers-Theunissen, C. W. Burger, and M. E. Vierhout, "Symptomatic pelvic organ prolapse and possible risk factors in a general population," *Am. J. Obstet. Gynecol.*, vol. 200, no. 2, pp. 184.e1–184.e7, 2009.
[21] P. A. Norton, J. E. Baker, H. C. Sharp, and J. C. Warenski, "Genitourinary prolapse and joint hypermobility in women," *Obstet. Gynecol.*, vol. 85, no. 2, pp. 225–228, 1995.
[22] R. Cartwright, A. C. Kirby, K. A. O. Tikkinen, A. Mangera, G. Thiagamoorthy, P. Rajan, et al., "Systematic review and metaanalysis of genetic association studies of urinary symptoms and prolapse," *Eur. Urol.*, vol. 68, no. 6, pp. 1020–1029, 2015.

[23] A. Miedel, G. Tegerstedt, M. Maehle-Schmidt, O. Nyrén, and M. Hammarström, "Nonobstetric risk factors for symptomatic pelvic organ prolapse," *Obstet. Gynecol.*, vol. 113, no. 5, pp. 1089–1097, 2009.