

The pelvic floor support in operative hysteroscopy patients

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Abstract

Aim: Pelvic organ prolapse is a pelvic floor disorder in which advancing age, obesity, and parity are the main risk factors. Although it is known that the prevalence is around 10% in the whole population, approximately half of the cases are asymptomatic. Pelvic organ prolapse is not expected in the absence of risk factors such as obesity, age, and parity. The aim of this study was to evaluate the pelvic floor support -without these risk factors- in patients who underwent operative hysteroscopy for benign gynecological reasons in a university hospital.

Material and Methods: In this prospective study, the Pelvic Organ Prolapse Quantification System (POP-Q) examination was performed in patients undergoing operative hysteroscopy with benign gynecological indications. The relationship between pelvic organ prolapse and risk factors such as obesity, age, and parity was investigated in these patients who were asymptomatic for pelvic floor disorders.

Results: 1256 patients underwent operative hysteroscopy under general anesthesia with benign gynecological indications. The mean age of the patients was 29.8 years. The most common indication for operative hysteroscopy was the endometrial polyps (21.9%). None of the patients who underwent operative hysteroscopy had any symptoms of pelvic floor disorders. Pelvic organ prolapse was detected in 57.5% of the patients in Stage-0, 22.4% in Stage-1, 19.2% in Stage-2, and 0.9% in Stage-3. None of the patients had total uterine procidentia (Stage-4). Even though they were asymptomatic, stage-2 pelvic organ prolapse was detected in 20% of normal-weight nulliparous patients younger than 30 years.

Conclusion: Pelvic floor disorders can also be seen in non-obese and nulliparous patients at a young age. Although such patients are asymptomatic, they should be referred to urogynecology clinics for optimal pelvic floor support in the following years.

Keywords: Operative hysteroscopy; pelvic organ prolapse; pelvic floor

INTRODUCTION

Pelvic organ prolapse is when one or more of the pelvic organs in the pelvis slip down from their normal position and bulge into the vagina. It is a real hernia of the pelvic organs to or through the vaginal opening. Pelvic organ prolapse is a severe pelvic floor disorder that is gradually increasing since the fourth decade of the women life. Pelvic floor defects are accounted for approximately 25% of postmenopausal women who have been operated for benign gynecological reasons (1). In women older than sixty years, half of the gynecological operations consist of pelvic floor surgeries (2).

The major risk factors for pelvic organ prolapse include parity, advancing age, and obesity (3). Other risk factors include genetic predisposition, hysterectomy, and pathologies that increase intra-abdominal pressure, such as asthma and chronic obstructive pulmonary diseases. When all these risk factors are considered as a whole,

pelvic organ prolapse can be thought to be a complex pelvic floor disorder caused by increasing body mass index with increasing age and increasing parity due to a genetic cause (4).

The presentation of pelvic organ prolapse usually occurs after the age of forties or in the perimenopausal period. The patient, who has given birth several times until this time, starts to see that there is something hanging down in the vagina with the effect of weight gain and advancing age (5). Patients often notice pelvic organ prolapse with the effect of gravity in the toilet, bathroom, or during sexual intercourse. However, more than half of the patients do not seek medical attention in the first place. Patients are primarily looking for self-help with simple daily measures such as thick hygienic pads, tissues, and tight underwear. The fact that the present pathology is a cosmetic problem and not life-threatening might be delayed the search for medical support (6). The duration of seeking medical advice due to the pelvic organ prolapse varies between

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6-12 months from the onset of clinical symptoms.

Prevalence studies in patients admitted to general gynecology outpatient clinics for benign gynecological reasons revealed stage-1 or stage-2 pelvic organ prolapse in approximately 20% of patients, although they were asymptomatic (7). This situation can be explained by the general demographic characteristics of the population seeking medical treatment. Indeed, as the parity increases, it is inevitable to predict such a negative effect with advancing age and increasing body mass index (8). Many clinicians do not expect pelvic floor disorders to occur in the absence of such risk factors. In this study, we investigated preoperative the pelvic floor support in a group of patients who underwent operative hysteroscopy in a population in which parity, age, and obesity were partially eliminated, which are the essential risk factors of pelvic organ prolapse.

MATERIAL and METHODS

This study was planned prospectively, in Urogynecology and Pelvic Reconstructive Surgery Unit in the Department of Obstetrics and Gynecology in Uludag University Hospital, Bursa, Turkey. Premenopausal patients aged between 20-45 years who underwent operative hysteroscopy with benign gynecological indications between June 1st, 2013 and December 31st, 2018 were included in the study. Demographic characteristics of the patients such as age (years), body mass index (kg/m²), parity, symptoms, duration of operation, and operation indication were recorded. The body mass index of patients was calculated by dividing body mass (kg) by the square of the total length (meter) of the body according to the classification of the World Health Organization, and the definitions of underweight, normal, overweight and obese were used (9). The ages of the patients were stratified from 20 to 45 years old, with five-year intervals. Each patient underwent preoperative anesthesia evaluation before the procedure. Patients with metabolic and hemodynamic systemic diseases, patients with cardiac instability, patients with hematologic multisystem disorders, and patients with malignancy were excluded from the study. Pelvic Organ Prolapse Quantification System (POP-Q) was used to evaluate the pelvic floor before starting the procedure in the lithotomy position (10). POP-Q staging of all patients was recorded before the procedure. After operative hysteroscopy, patients who were observed in the clinic for 2-6 hours were discharged.

The Pelvic Organ Prolapse Quantifications System (POP-Q)

The Pelvic Organ Prolapse Quantifications System (POP-Q), is a system of assessing the degree of prolapse of pelvic organs to help standardize diagnosing, comparing, documenting, and sharing of clinical findings. The POP-Q system was developed in 1996, and it quantifies the descent of pelvic organs into the vagina. Since 1996, this staging system has been accepted by all institutions and organizations of urogynecology as the

basic quantitative pelvic organ prolapse classification system. In our department, measurements are made with a ruler in centimeters while the patient is in the lithotomy position. Aa (A point anterior), Ba (B point anterior) measurements are taken to evaluate the anterior compartment, C (Cervix) and D (Douglas) points are measured for the apical compartment and Ap (A point posterior), Bp (B point posterior) measurements are taken to evaluate the posterior compartment. Staging is done according to the lowest point. Stage-0 is the normal pelvic floor support. Stage-1 is that the leading point lies >1 cm above the hymen. Stage-2 is that the leading point lies from -1 cm to +1 points according to the hymen. Stage-3 is that the leading point lies >1 cm below the hymen to total procidentia of the uterus. Stage-4 is the complete uterine procidentia.

Ethical implications

Although this prospective study design did not involve any invasive procedure on patients, it was approved by the Medical Researches Ethics Committee of Uludağ University (UU-SUAM-MREC-2013-9/22) in accordance with the Helsinki Declaration.

Statistical Analyses

Statistical analysis of the results was performed using SPSS (Statistical Package for Social Sciences 23.0 for Windows) and Microsoft Office Excel. Shapiro Wilk test was used to evaluate whether the variables show normal distribution or not. Descriptive statistics such as age and body mass index were reported as median (minimum: maximum) and categorical variables as n (%). Pearson chi-square test was used to compare categorical variables. A p-value of less than 0.05 was considered statistically significant.

RESULTS

The baseline characteristics

We included 1277 patients aged between 20-45 years who underwent operative hysteroscopy for different benign gynecological reasons. 21 patients were excluded from the study due to hemodynamic instability, malignancy, or the patient's refusal to participate in the study (Figure-1/A).

Indications for operative hysteroscopy are shown in Table-1. While the most common indication for hysteroscopy was endometrial polyps with 21.9% (276 patients), the rarest indication for hysteroscopy were uterine anomalies with 10.6% (132 patients).

The staging of 1256 patients included in the study for pelvic organ prolapse according to POP-Q system classification is shown in Figure-1/B. 57.5% of patients had stage-0 pelvic organ prolapse (722 patients), 22.4% had stage-1 (281 patients), 19.2% had stage-2 (241 patients) and 0.9% had Stage-3 (12 patients) pelvic organ prolapse. Stage-4 pelvic organ prolapse was not observed in any of the patients.

Table 1. Indications for operative hysteroscopy	
Hysteroscopy indication	Number of patients n (%)
Endometrial polyp	276 (%21.9)
Abnormal uterine bleeding	258 (%20.6)
Submucous myoma	189 (%15.0)
Septum uteri	165 (%13.1)
Uterine anomalies	132 (%10.6)
Removal of Foreign Bodies (Intrauterine Device etc.)	236 (%18.8)
Total	1256 (%100)

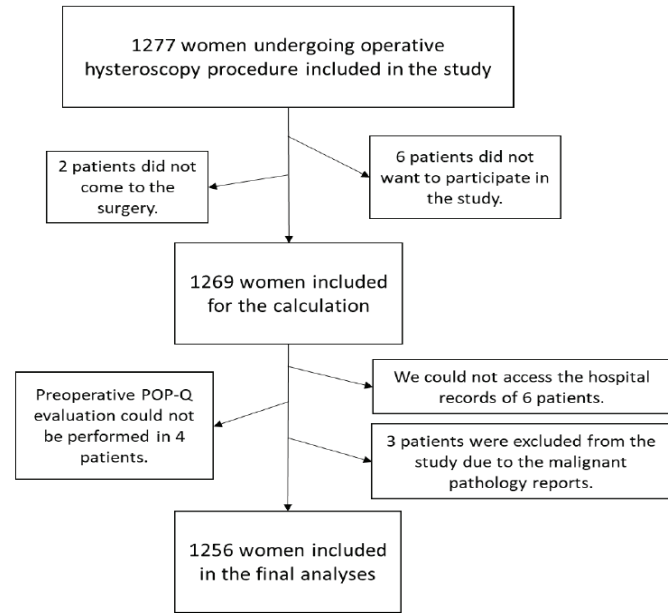
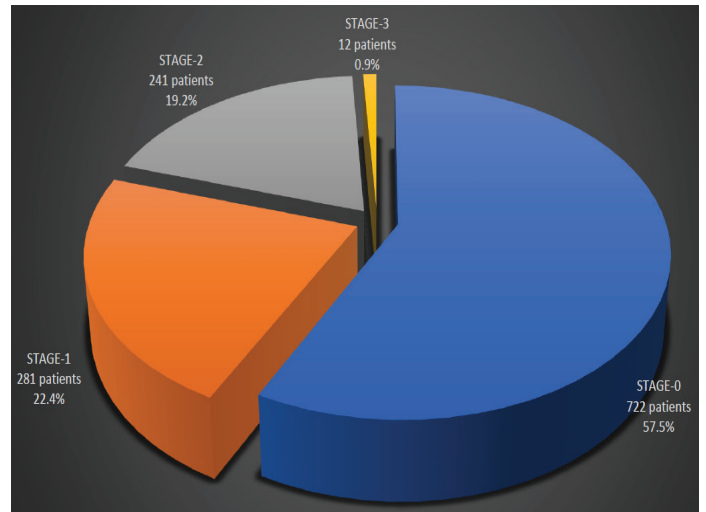


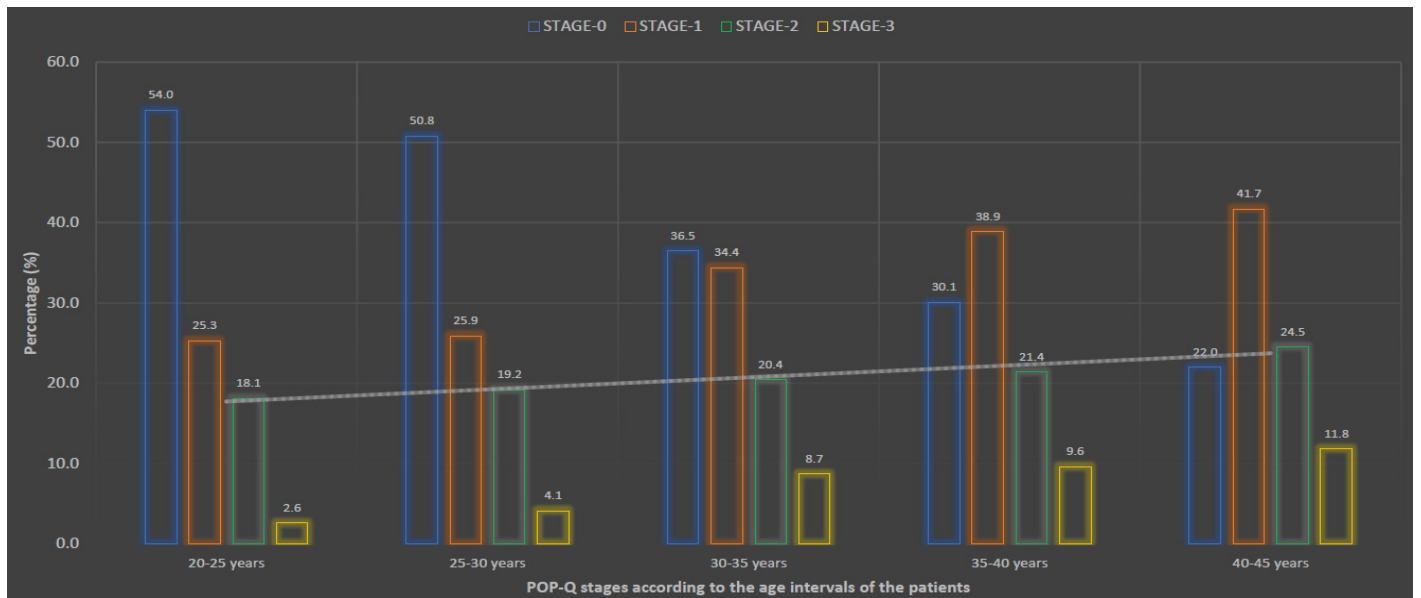
Figure1-A. Study Flowchart



Total number of patients: n=1256 patients
POP-Q: Pelvic Organ Prolapse Quantification System classification

Figure1-B. POP-Q classification of patients in pie chart graph. Note that there is no Stage-4 prolapse patient in the cohort

The mean age of the patients was 29.8 (20-45) years. The graphical relationship between the age of the patients and the POP-Q prolapse stages is given in Figure-2. Although there are no symptoms of pelvic floor disorders in patients, Stage-2 pelvic organ prolapse was detected in 18.1% of the patients in the 20-25 age group, 19.2% in the 25-30 age group, 20.4% in the 30-35 age group, 21.4% in the 35-40 age group, and 24.5% in the 40-45 age group. Stage-3 pelvic organ prolapse was 2.6%; 4.1%; 8.7%; 9.6% and 11.8%, in the age intervals respectively. There was no stage-4 pelvic organ prolapse at any age interval of the patients.

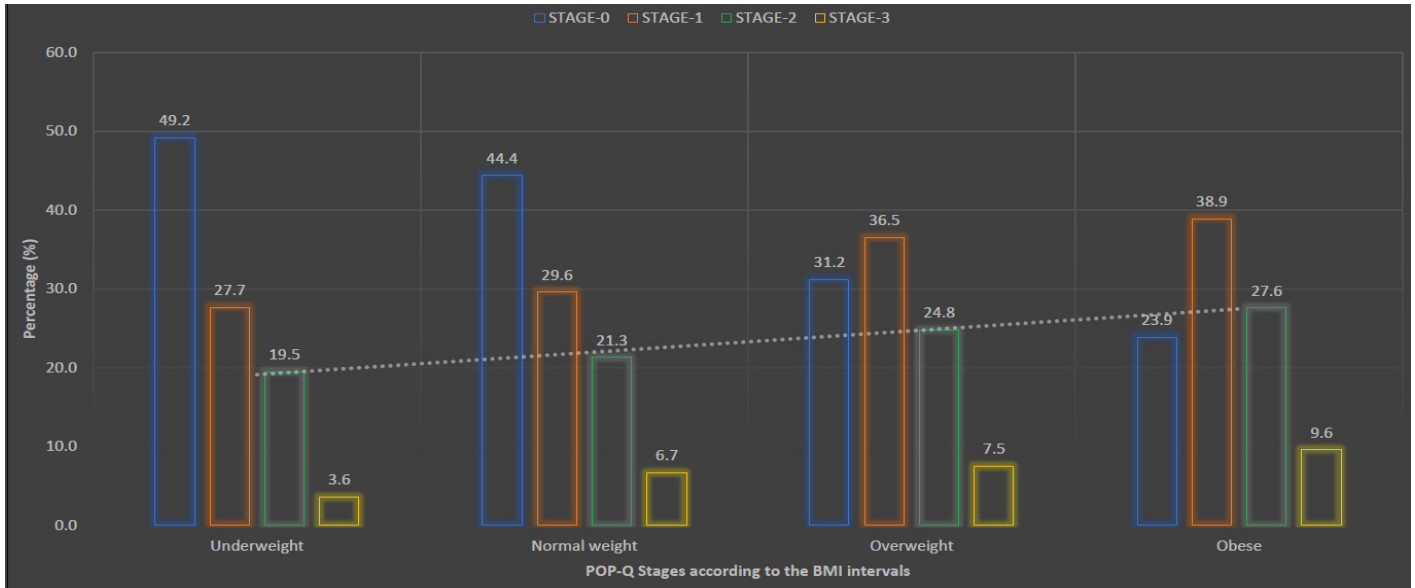


POP-Q: Pelvic Organ Prolapse Quantification system

Figure 2. Relationship between age of patients and POP-Q prolapse stages. Note that none of the patients had stage-4 pelvic organ prolapse

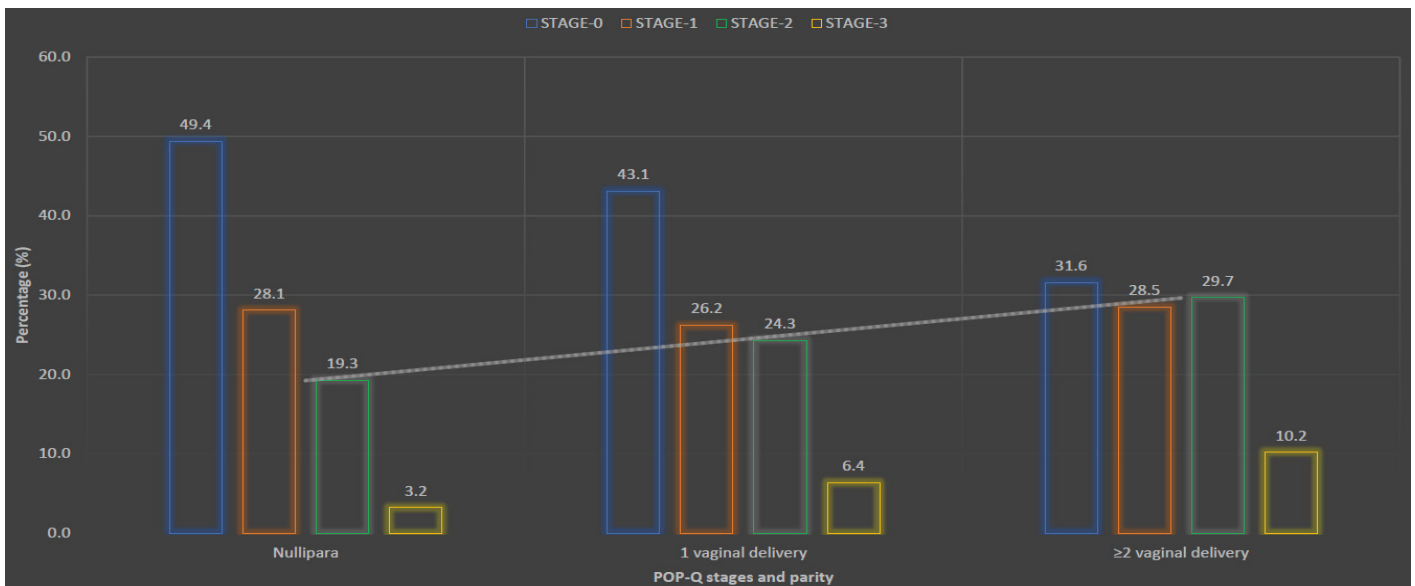
The mean body mass index of the patients was 28.7 (18.7-42.9) kg/m². The graphical relationship between the POP-Q stages according to the body mass index of the patients is given in Figure-3. Although the patients included in the study had no signs of pelvic floor disorders, 19.5% of underweight BMI patients, 21.3% of normal-weight BMI patients, 24.8% of overweight BMI patients, and 27.6% of obese patients had stage-2 pelvic organ prolapse. Stage-3 pelvic organ prolapse was detected 3.6%, 6.7%, 7.5%, and 9.6% according to the BMI intervals, respectively. Stage-4 pelvic organ prolapse was not observed in any BMI group.

The mean parity of the patients was 2.6 (0-5). The graphical relationship between the POP-Q stages according to parity characteristics of the patients included in the study is given in Figure-4. Stage-2 pelvic organ prolapse was detected in 19.3% of nulliparous patients, 24.3% of those with a history of one vaginal delivery, and 29.7% of those who had two or more births, although there were no signs of pelvic floor disorders. Stage-3 pelvic organ prolapse was 3.2%, 6.4% and 10.52% in the parity groups, respectively. Stage-4 pelvic organ prolapse was not observed in any parity group.



POP-Q: Pelvic Organ Prolapse Quantification system

Figure 3. Relationship between BMI and POP-Q stages of operative hysteroscopy patients. Note that Stage-4 pelvic organ prolapse was not observed in any BMI group



POP-Q: Pelvic Organ Prolapse Quantification system

Figure 4. Graphical relationship between parity and POP-Q prolapse stages of the patients

DISCUSSION

In this prospective study, we have performed POP-Q staging to operative hysteroscopy patients and detected Stage-2 pelvic organ prolapse in 20% of patients, although there were no signs of pelvic floor disorder in patients. The most important characteristic of this study was the detection of 20% of stage-2 pelvic organ prolapse, even in patients without risk factors such as multiparity, advancing age, and obesity, which are the most critical risk factors for pelvic organ prolapse.

Although it is not mortal, pelvic organ prolapse affects millions of women all over the world, especially in the perimenopausal and postmenopausal period. Many risk factors may worsen the pelvic organ prolapse (11). Multiparity, obesity, advancing age, and genetic predisposition are the most crucial risk factors for pelvic organ prolapse. Many physical, physiological, and pathological factors that are exposed throughout the life span and continuously increase intraabdominal pressure may also worsen the pelvic organ prolapse.

Advancing age and pelvic organ prolapse:

Many epidemiological studies conducted so far have shown that advancing age is a significant risk factor for pelvic organ prolapse (12-13). For instance, in a study by Tinelli et al., advanced age was found to be an independent risk factor for pelvic organ prolapse (14-15). In our study, we have observed that pelvic organ prolapse is more frequently as age progressed. But more interestingly, we found at least Stage-2 pelvic organ prolapse in approximately 20% of patients, even at an early age. We think that this condition is in other etiologic factors and multifactorial etiopathogenesis.

Increased parity and pelvic organ prolapse:

Pelvic organ prolapse is directly proportional to increased parity (16). Oxford family planning study gave the best example of this data (17). In this study where more than 17,000 women were followed for more the 17 years, the rate of hospitalization for pelvic organ prolapse increased quadruple with increasing parity. Even parity is thought to be related to 75% of pelvic organ prolapse cases (18-19). In our study, we observed that pelvic organ prolapse increased in direct proportion with increasing parity. However, we found that even 20% of nulliparous patients had stage-2 pelvic organ prolapse. This data suggests that pelvic organ prolapse is more common than thought.

Obesity and pelvic organ prolapse:

It has been documented many times that obese patients experience pelvic floor disorders more often than normal-weight patients (20). In a meta-analysis, it was reported that the rate of obese patients with pelvic floor disorders increased by 50% compared to normal-weight patients (21). In our study, increases in body mass index and pelvic organ prolapse were two related factors. However, we found 19.5% of pelvic organ prolapse even in normal-weight patients. This data suggests that there may be

many different mechanisms in the etiopathogenesis of pelvic organ prolapse.

Pelvic organ prolapse in an asymptomatic normal population:

Stage-1 and Stage-2 pelvic organ prolapse were detected in approximately half of the patients who applied to gynecology outpatient clinics for another reason without any symptoms of pelvic organ prolapse. For example, Nygard et al. found that stage-2 pelvic organ prolapse in the American population was 50% (16). In many different kinds of research, this ratio is shown between 30-50%. Indeed, studies conducted in our country show that there is stage-2 pelvic organ prolapse in the healthy and asymptomatic population of 25-30%. In our study, we investigated the pelvic organ prolapse in a more specific group of patients in the reproductive age under 45 years, and interestingly, we found that even 20% of patients with no risk factors such as parity, age, and body mass index could have Stage-2 pelvic organ prolapse. From this point of view, we anticipate that we may encounter more pelvic floor disorders at any time in women's lives than actually thought.

In a study conducted by Yıldız et al., it was shown that Stage-2 and above pelvic organ prolapse patients had much parity, were overweight and older compared to the patients without pelvic organ prolapse (22). Indeed, these risk factors are one of the most critical risk factors for pelvic organ prolapse. In our study, even when eliminating these risk factors, we still found Stage-2 pelvic organ prolapse in approximately 20% of patients. This situation suggests that the etiopathogenesis of pelvic organ prolapse is affected by many complex risk factors and that genetic predisposition may play a significant role as these risk factors.

In the POSST study conducted by Swift et al., patients who applied to the gynecology outpatient clinic for different reasons and who were asymptomatic for pelvic floor defects were evaluated (23). According to this study, there was a bell-shaped distribution of pelvic organ support in a gynecology population. Advancing age, increasing body mass index, and the increasing weight of the vaginally delivered fetus had the strongest correlations with prolapse (24). The main difference in our study from this study was that approximately 20% of pelvic organ prolapse was still seen even in the patients where these three risk factors were eliminated. Although these patients were asymptomatic, when the POP-Q staging was performed, the C point reached to the hymen level in these patients. These results can show that many different etiologic causes feed pelvic organ prolapse.

Previous studies of pelvic organ prolapse with many other gynecological pathologies, such as in our research, have attracted the attention of other researchers. For instance, Cinar et al. found that POP-Q measurement assessment should be a promising marker in predicting intrauterine device expulsion (25). In another study published by

Karasu et al., women who were older and who had advanced stage pelvic organ prolapse were more likely to have microscopic hematuria (26).

CONCLUSION

In conclusion, when we evaluate the asymptomatic gynecological population from a urogynecological perspective, we have demonstrated that the pelvic organ prolapse is much more common than assumed even in young, nullipara, and normal-weight women. In our study, we have found that Stage-2 pelvic organ prolapse is still around 20%, even when the main risk factors of pelvic organ prolapse such as multiparity, advanced age, and obesity are eliminated. We believe that daily routines such as Kegel exercises that will increase the importance of pelvic floor health and raise public awareness should be implemented in this context.

Competing interests: Written informed consent was obtained from each patient included in the study.

Financial Disclosure: This project is an investigator-driven non-commercial trial. All costs linked to the design and the daily conduct of the trial were paid by the investigator without any financial support from a pharmaceutical company or any other third party.

Ethical approval: This study was approved by the Medical Researches Ethics Committee of Uludağ University (UU-SUAM-MREC-2013-9/22) in accordance with the Helsinki Declaration.

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REFERENCES

1. Wu JM, Hundley AF, Fulton RG, et al. Forecasting the prevalence of pelvic floor disorders in U.S. Women: 2010 to 2050. *Obstet Gynecol* 2009;114:1278.
2. Oliphant SS, Jones KA, Wang L, et al. Trends over time with commonly performed obstetric and gynecologic inpatient procedures. *Obstet Gynecol* 2010;116:926.
3. Rortveit G, Brown JS, Thom DH, et al. Symptomatic pelvic organ prolapse: prevalence and risk factors in a population-based, racially diverse cohort. *Obstet Gynecol* 2007;109:1396.
4. Smith FJ, Holman CD, Moorin RE, et al. Lifetime risk of undergoing surgery for pelvic organ prolapse. *Obstet Gynecol* 2010; 116:1096.
5. Lowder JL, Ghetti C, Nikolajski C, et al. Body image perceptions in women with pelvic organ prolapse: a qualitative study. *Am J Obstet Gynecol* 2011;204:441. e1.
6. Barber MD, Maher C. Epidemiology and outcome assessment of pelvic organ prolapse. *Int Urogynecol J* 2013;24:1783.
7. Friedman T, Eslick GD, Dietz HP. Risk factors for prolapse recurrence: systematic review and meta-analysis. *Int Urogynecol J* 2018;29:13.
8. Jelovsek JE, Maher C, Barber MD. Pelvic organ prolapse. *Lancet* 2007;369:1027.
9. World Human Organization: Body mass index - BMI <http://www.euro.who.int/en/health-topics/disease-prevention/nutrition/a-healthy-lifestyle/body-mass-index-bmi>
10. Bump RC, Mattiasson A, Bø K, et al. The standardization of terminology of female pelvic organ prolapse and pelvic floor dysfunction. *Am J Obstet Gynecol* 1996;175:10-7.
11. Vergeldt TF, Weemhoff M, IntHout J, et al. Risk factors for pelvic organ prolapse and its recurrence: a systematic review. *Int Urogynecol J* 2015; 26:1559.
12. Olsen AL, Smith VJ, Bergstrom JO, et al. Epidemiology of surgically managed pelvic organ prolapse and urinary incontinence. *Obstet Gynecol* 1997;89:501
13. Hendrix SL, Clark A, Nygaard I, et al. Pelvic organ prolapse in the Women's Health Initiative: gravity and gravidity. *Am J Obstet Gynecol* 2002; 186:1160.
14. Tinelli A, Malvasi A, Rahimi S, et al. Age-related pelvic floor modifications and prolapse risk factors in postmenopausal women. *Menopause* 2010;17:204.
15. Swift S, Woodman P, O'Boyle A, et al. Pelvic Organ Support Study (POSST): the distribution, clinical definition, and epidemiologic condition of pelvic organ support defects. *Am J Obstet Gynecol* 2005; 192:795.
16. Nygaard I, Barber MD, Burgio KL, et al. Prevalence of symptomatic pelvic floor disorders in US women. *JAMA* 2008; 300:1311. Sze EH, Sherard GB 3rd, Dolezal JM. Pregnancy, labor, delivery, and pelvic organ prolapse. *Obstet Gynecol* 2002;100:981.
17. Mant J, Painter R, Vessey M. Epidemiology of genital prolapse: observations from the Oxford Family Planning Association Study. *Br J Obstet Gynaecol* 1997;104:579.
18. Patel DA, Xu X, Thomason AD, et al. Childbirth and pelvic floor dysfunction: an epidemiologic approach to the assessment of prevention opportunities at delivery. *Am J Obstet Gynecol* 2006;195:23.
19. DeLancey JO, Kearney R, Chou Q, et al. The appearance of levator ani muscle abnormalities in magnetic resonance images after vaginal delivery. *Obstet Gynecol* 2003;101:46
20. Kudish BI, Iglesia CB, Sokol RJ, et al. Effect of weight change on natural history of pelvic organ prolapse. *Obstet Gynecol* 2009;113:81.
21. Giri A, Hartmann KE, Hellwege JN, et al. Obesity and pelvic organ prolapse: a systematic review and meta-analysis of observational studies. *Am J Obstet Gynecol* 2017.
22. Yıldız E, Dinçgeç Çakmak B, Ketenci Gencer F, et al. Perimenopozal Kadınlarda Pelvik Organ Prolapsusu Sıklığı, Şiddeti ve Risk Faktörleri. *Okmeydanı Tıp Dergisi* 2018;34:148-53.
23. Swift S, Woodman P, O'Boyle A, et al. Pelvic Organ Support Study (POSST): the distribution, clinical definition, and epidemiologic condition of pelvic organ

- support defects. Am J Obstet Gynecol 2005;192:795.
24. Tegerstedt G, Maehle-Schmidt M, Nyrén O, et al. Prevalence of symptomatic pelvic organ prolapse in a Swedish population. Int Urogynecol J Pelvic Floor Dysfunct 2005;16:497.
25. Cinar M, Aksoy RT, Tokmak A, et al. Does pelvic organ prolapse relate with expulsion of intrauterine devices? Gynecol Obstet Reprod Med 2016;22:80-3.
26. Gokmen Karasu AF, Aydin S, Adanir I, et al. Age may be the only variable effecting microhematuria prevalence in pelvic organ prolapse. Gynecol Obstet Reprod Med 2018;24:143-6.