

# Frequency and Risk Factors of Urinary Incontinence After Hysterectomy

## Histerektomi Sonrası Üriner İnkontinansın Görülme Sıklığı ve Risk Faktörleri

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Ankara Yıldırım Beyazıt University, Faculty of Medicine Department of Obstetrics and Gynecology, Ankara, Turkey

### Abstract

**Objectives:** To determine the frequency of urinary incontinence developing after different types of hysterectomies performed for benign indications and the possible risk factors associated with this condition.

**Materials and Methods:** Data of women who undergone hysterectomies for benign indications during one-year period were analyzed retrospectively. Women who stated to have urinary incontinence in the twelve-month postoperative follow-up were defined as the case group. Women who did not have urinary incontinence were the control group. Risk factors associated with urinary incontinence developing after hysterectomy were determined by multiple regression analysis.

**Results:** After 300 total hysterectomies performed in a twelve-month period, urinary incontinence was detected in 44 (14.7%) women. Age over 60 years, menopause, obesity and presence of >2 grade pelvic organ prolapse were determined as significant independent factors for the development of urinary incontinence after hysterectomy. The type of hysterectomy (abdominal, vaginal, or laparoscopic) was not a risk factor.

**Conclusion:** Urinary incontinence after hysterectomy can be seen with considerable frequency. Regardless of the type of hysterectomy, it is more likely to be seen in the presence of age over 60 years, menopause, obesity, and severe prolapse.

**Key Words:** Hysterectomy, Urinary Incontinence, Risk Factor

### Öz

**Amaç:** Benign endikasyonlar için yapılan farklı histerektomi tiplerinden sonra gelişen üriner inkontinans sıklığını ve bu durumla ilişkili olası risk faktörlerini belirlemek.

**Gereç ve Yöntem:** Bir yıllık süre içinde benign endikasyon nedeni ile histerektomi uygulanan kadınların verileri retrospektif olarak incelendi. Olgu grubu olarak postoperatif on iki aylık takipte üriner inkontinansı olduğunu belirten kadınlar belirlendi. Üriner inkontinansı olmayan kadınlar kontrol grubu olarak belirlendi. Histerektomi sonrası gelişen üriner inkontinans ile ilişkili risk faktörleri çoklu regresyon analizi ile incelendi.

**Bulgular:** On iki aylık sürede yapılan 300 total histerektomi sonrası 44 (%14,7) kadında idrar kaçırma tespit edildi. Altmış yaş üstünde olmak, menapoz, obezite ve >2 derece pelvik organ prolapsusu varlığı histerektomi sonrası üriner inkontinans gelişimi için önemli bağımsız faktörler olarak belirlendi. Histerektomi tipi (abdominal, vajinal veya laparoskopik) bir risk faktörü değildi.

**Sonuç:** Histerektomi sonrası üriner inkontinans sıklığı dikkate değer oranlardadır. Histerektominin türü ne olursa olsun, 60 yaş üstü, menapoz, obezite ve şiddetli prolapsus varlığında görülme olasılığı daha yüksektir.

**Anahtar Kelimeler:** Histerektomi, Üriner İnkontinans, Risk Faktör

Address for Correspondence/Yazışma Adresi: Batuhan Turgay

Ankara Yıldırım Beyazıt University, Department of Obstetrics and Gynecology, Ankara, Turkey

Phone: +90 537 285 53 99 E-mail: batuhanturgay@hotmail.com ORCID ID: orcid.org/0000-0001-9927-181X

Received/Geliş Tarihi: 09.07.2021 Accepted/Kabul Tarihi: 12.07.2021

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Journal of Ankara University Faculty of Medicine is published by Galenos Publishing House.

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## Introduction

Hysterectomy is one of the most common gynecological operations all over the world. It is mostly performed for benign reasons and aims to increase the patient's quality of life and to prevent future morbidity and mortality. Basically, hysterectomies are performed via three approaches: Abdominal, vaginal or endoscopic way. Whichever way it is performed, theoretically, the anatomical integrity with the surrounding tissues is impaired after hysterectomy, and the neurological support may be damaged. After such negative effects, some health problems related to the pelvic floor may occur (1,2).

Urinary incontinence (UI) is a health problem that negatively affects quality of life. Its frequency increases with age and approximately one in two women over the age of 60 may face this problem (3). Disturbances in the anatomical integrity or neurological support of the pelvic floor are among the causes in pathophysiology (4). Therefore, hysterectomy may be a reason for the development of UI. However, there has not been a complete consensus in the studies on this subject (5-7). It is not clear which type of hysterectomy or which patients may develop UI after hysterectomy.

In our study, we aimed to determine the frequency of UI developing after different types of hysterectomy and the risk factors that may cause this condition.

## Materials and Methods

This retrospective study was approved by the Local Academic Board and Ethical Committee (number: 2021-07-01) and was designed in accordance with Helsinki Declaration. Women who underwent different types of hysterectomy for benign indications in our hospital between January 2018 - January 2019 within a twelve-month period were included in the study. Preoperative demographic and clinical characteristics, intraoperative findings, and postoperative follow-up notes up to 12 months were recorded by examining the hospital records of all women. Women who received medical or surgical treatment for UI before the operation, who underwent hysterectomy together with incontinence surgery and who had insufficient records were excluded from the study.

Women who were found to have received any surgical or medical treatment for UI during their 12-month postoperative follow-up were defined as the case group, while women without such a condition formed the control group.

### Statistical Analysis

SPSS 20.0 statistical software (SPSS, Inc., Chicago, IL, USA) program was used to analysis the collected data. Continuous data and categorical data were presented as mean  $\pm$  standard

deviation and number (%), respectively. Continuous variables were analyzed by Independent Student's t-test and chi-square tests were used for the analysis of categorical variables. Multivariable logistic regression model was performed to determine the significant independent factors for the development of UI after hysterectomy.  $P < 0.05$  was considered statistically significant.

## Results

Initially, we identified 343 records for our study. In the retrospective evaluation of these, we found that 7 women received treatment for UI before the operation, 20 had anti-incontinence surgery together with hysterectomy, and 16 had insufficient records and excluded all these women from the study. Ultimately, our study population consisted of 300 women. Considering their postoperative follow-ups, it was determined that 44 (14.7%) of them had additional treatment (18 surgery, 26 patients medical treatment) due to UI and constituted the case group. The remaining 256 women were defined as the control group.

Table 1 lists the characteristics of women with (case group) and without (control group) postoperative UI. Accordingly, the mean age of women and body mass index values, rate of  $>60$  years of age, vaginal delivery  $>1$ , obesity, menopause, and preoperative  $>$ grade 2 pelvic organ prolapse (POP) were higher in the case group than in the control group. However, there was no statistically significant difference between the two groups in terms of the type of hysterectomy performed ( $p=0.529$ ).

As a result of the multiple regression analysis of the factors that showed significant differences between the two groups, age  $>60$  years ( $p=0.001$ ), being obese ( $p<0.001$ ), presence of menopause ( $p=0.002$ ) and preoperative  $>$ grade 2 POP ( $p<0.001$ ) were found to be significant independent factors for the development of UI after hysterectomy (Table 2).

## Discussion

In our study, we detected the presence of UI developing after hysterectomy as 14.7%, regardless of the type. Although there is no clear rate on this subject in the literature, this frequency rate has been described in a wide range such as 8.5%-43.0% due to the heterogeneity of the design, descriptive features and follow-up periods of the publications (1,8,9). Since our rate is in this range, it can be seen as an acceptable value. Apart from this frequency uncertainty, another debate is whether the presence of hysterectomy is a possible cause for subsequent UI. In the Women's Health Initiative study, it was reported that the incidence of UI was higher in patients with a history of hysterectomy than in patients with an intact uterus (2). Similarly, a review of 11 epidemiological studies has shown that

**Table 1: Characteristics of the groups**

	Postoperative UI (Cases, n=44)	Postoperative No UI (Controls, n=256)	p-value
Age at surgery (years)	55.3±7.5	50.5±6.5	<0.001
Age >60 years	20 (45.5)	24 (9.4)	<0.001
Parity	3.3±1.6	3.6±1.3	0.193
Vaginal delivery>1	28 (63.6)	204 (79.7)	0.019
Cesarean delivery only	12 (27.3)	52 (20.3)	0.298
BMI (kg/m <sup>2</sup> ) at surgery	30.6±1.9	29.1±2.4	<0.001
Obesity (BMI≥30 kg/m <sup>2</sup> )	28 (63.6)	72 (28.1)	<0.001
Current smoking	12 (27.3)	92 (35.9)	0.265
Menopausal status	32 (72.7)	76 (29.7)	<0.001
Diabetes	8 (18.2)	76 (29.7)	0.116
Hypertension	19 (43.2)	80 (31.3)	0.152
Preoperative >Grade 2 POP	32 (72.7)	64 (25.0)	<0.001
<b>Indication for hysterectomy</b>			
AUB	16 (36.4)	64 (25.4)	0.072
Fibroids	12 (27.3)	104 (40.6)	
Prolapse	8 (18.2)	64 (25.0)	
Others	8 (18.2)	24 (9.4)	
<b>Type of hysterectomy</b>			
Abdominal	20 (45.5)	116 (45.3)	0.529
Vaginal	16 (36.4)	76 (29.7)	
Laparoscopic	8 (18.2)	64 (25.0)	
Concomitant BSO	24 (54.5)	140 (54.7)	0.986
Concomitant cytocelele repair	12 (27.3)	80 (31.3)	0.597
Concomitant rectocelele repair	14 (31.8)	76 (29.7)	0.404
Uterine weight >500g	18 (40.9)	116 (45.3)	0.358
Postoperative HRT use	8 (18.2)	65 (25.4)	0.129

Values were presented as mean±standard deviation and number (%).

BMI: Body mass index, POP: Pelvic organ prolapse, AUB: Abnormal uterine bleeding, UI: Urinary incontinence, BSO: Bilateral salpingo-oophorectomy, HRT: Hormone replacement therapy

p<0.05 was considered statistically significant

**Table 2: Logistic regression analysis of factors related to urinary incontinence after hysterectomy**

	Wald	S.E.	p-value	Exp (B) (95% CI)
Age>60 years	11.8	0.5	0.001	5.9 (2.1-16.2)
Vaginal delivery>1	1.6	0.5	0.210	0.5 (0.2-1.4)
Menopausal status	9.3	0.5	0.002	4.9 (1.8-13.8)
Obesity	29.4	0.5	<0.001	18.4 (6.4-52.5)
Preoperative >Grade 2 POP	25.4	0.5	<0.001	0.1 (0.0-0.2)

S.E.: Standard error, CI: Confidence interval, POP: Pelvic organ prolapse

p<0.05 was considered statistically significant

women who have undergone a hysterectomy have at least %40 higher risk of developing UI than those who have not operated (9). On the other hand, Altman et al. (10) and Gustafsson et al. (11) emphasized in their observational studies that abdominal or vaginal hysterectomy did not impair lower urinary system functions and was not associated with the development of UI.

In our study, no difference was found in the frequency of UI developing after three types of hysterectomy operations. These findings are similar to many studies in the literature (12-14). On the other hand, although there are studies that reported vaginal hysterectomy as a possible risk factor for UI, studies with long-term results also support our results (15,16). In a study of the Swedish population, in which more than 160000 hysterectomized women and 470000 non-hysterectomized women were compared and the results of a 30-year follow-up period were reported, no relationship was found between the incidence of UI and any type of hysterectomy (17). In another study examining the long-term effects of hysterectomy, Müller et al. (18) found no difference in the prevalence of UI after surgery, regardless of the type of hysterectomy. In fact, associating the hysterectomy type with the development of UI is difficult in theory and in practice and can be controversial. Because many additional factors accompanying the operation, such as the patient's age, background characteristics, physical and health status, daily habits, operation indication, may affect the development of incontinence after the operation. As a result of the findings in our study and other studies with similar results, it should be considered that such additional factors may be the main cause rather than the type of hysterectomy.

In our study, advanced age, obesity, menopause and the presence of >2 grade POP were determined as independent risk factors for the development of UI after hysterectomy. In fact, these are possible risk factors identified for pelvic floor dysfunction (8,19,20). With aging and menopause, the pelvic floor weakens. The presence of obesity can also lead to weakening of the pelvic floor by increasing the pressure on the pelvic floor. The presence of advanced prolapse also indicates weakened pelvic floor support. When hysterectomy is performed together with these factors, it is possible that the predisposition of women to additional pathologies related to the lower urinary system such as UI will increase as a result of further deterioration of the anatomical support in the pelvic floor.

### Study Limitations

There are some limitations in our study. The fact that it is a retrospective study may raise doubts about the reliability of the data. The fact that only the women who applied to the hospital for UI complaints constitute the case group during the postoperative follow-up and that all women were not evaluated

objectively in terms of UI symptoms in the postoperative follow-up may create controversy in terms of the frequency of incontinence and the accuracy of the results. In addition, our study needs additional data on long-term outcomes, as it includes a 12-month postoperative follow-up. On the other hand, our study is important in terms of emphasizing a health problem that may adversely affect the quality of life after hysterectomy and showing in which situations this possibility increases, and therefore guiding the implementation of preventive medicine such as lifestyle changes and pelvic floor exercises for patients in order to perform preventive medicine in the presence of these factors.

## Conclusion

In conclusion, the development of UI after hysterectomy is not uncommon and occurs regardless of the type of hysterectomy performed. The possibility of developing UI in the early postoperative period increases when hysterectomy is performed in elderly (>60 years), obese women, in the presence of menopause, and in cases of severe prolapse. Therefore, in the presence of these factors, it is important to provide information about the UI symptoms that may occur in the future in women who are scheduled for hysterectomy and to take the necessary precautions to increase patient satisfaction and the trust between patient and doctor. Nevertheless, randomized controlled studies with larger participation and longer follow-up are needed to reach clearer information on this topic.

## Ethics

**Ethics Committee Approval:** This study is approved by the Academic Board of Ankara Yıldırım Beyazıt University Faculty of Medicine, Department of Obstetrics and Gynecology (number: 2021-07-01).

**Informed Consent:** Retrospective study.

**Peer-reviewed:** Externally peer-reviewed.

## Authorship Contributions

Surgical and Medical Practices: A.F.Y., Concept: B.T., A.F.Y., Design: B.T., A.F.Y., Data Collection or Processing: B.T., Analysis or Interpretation: B.T., Literature Search: B.T., Writing: B.T., A.F.Y.

**Conflict of Interest:** There is no conflict of interest.

**Financial Disclosure:** There is no financial disclosure.

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