

# IS HYSTERECTOMY A RISK FACTOR FOR URINARY INCONTINENCE?

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## Abstract

**Background:** Urinary incontinence has a significant and substantial impact on physical, psychological, social, and sexual health-related quality of life of a woman. The impact of hysterectomy on urinary incontinence remains controversial. Aim of this study was to evaluate an association between hysterectomy and urinary incontinence in women aged 45 years and above.

**Methods:** Women (aged 45- 70 years )with uteri(n=160) and without uteri(n=160) who enrolled in this cross sectional comparative study between October 2020 and April 2022, were included for analysis. Socio-demographic, gynaecological details and Urogenital Distress Inventory (UDI)-6 questionnaire were used. Chi square test was used for analysis and p value <0.05 was considered statistically significant.

**Results:** Mean age of hysterectomy and non hysterectomy group was 51.3±6.21years and 54.4±5.23 years respectively. The prevalence of urinary incontinence in group A and Group B was found to be 44.4% and 41.9% respectively. There was no statistically significant difference between the two groups with respect to prevalence of urinary incontinence (p value =0.652). Patients of post hysterectomy group had statistically significant higher urogenital distress inventory (UDI) scores (p=0.003).

**Conclusions:** Hysterectomy is not associated with higher risk of urinary incontinence. However, post hysterectomy women face higher distress due to urinary symptoms.

**Key words:** Hysterectomy, Urinary Incontinence, Urogenital Distress Inventory

**Abbreviations:** UDI: Urogenital Distress Inventory

**Introduction:** Urinary incontinence(UI) is defined as “the complaint of any involuntary leakage of urine” by International continence society.<sup>1</sup>It can be either urge urinary incontinence, stress urinary incontinence or the mixed type.

Urinary incontinence is a worldwide problem, the median prevalence of female urinary incontinence being 27.6% (range: 4.8–58.4%)<sup>2</sup>.The prevalence of urinary incontinence has been reported to be 21.87% in Indian women by Singh U et al<sup>3</sup>, stress, mixed, and urge incontinence being 16.13%, 3.67%, and 2.07%, respectively.

Urinary incontinence has a significant and substantial impact on physical, psychological, social, and sexual health-related quality of life (HRQOL)<sup>4</sup>. Women avoid social gatherings and lose self-confidence, which has a proportional impact on their social interactions and sexual and psychological health. Apart from the emotional and social repercussions, urinary incontinence is also a risk factor for other physical conditions and diseases, while simultaneously being afflicted with financial burden. Frequency, nocturia, urgency, and urge incontinence have also been shown to increase the risk of falls, which may lead to fractures and other morbidities<sup>3,5</sup>.

There are various risk factors for urinary incontinence including age, parity, obesity, menopause, gait speed and hysterectomy. The association between hysterectomy and incontinence has been studied, with conflicting results<sup>3,6-10</sup>. The most biologically plausible rationale for this association is surgical trauma caused when uterus and cervix are severed from pelvic floor supportive tissues at the time of hysterectomy. Hysterectomy could interfere with intricate urethral sphincter mechanism by damaging distal branches of pudendal nerves and inferior hypogastric plexus but it might also result in changes in bladder and urethral neck support.

Studies show conflicting results regarding association between hysterectomy and urinary incontinence<sup>3,6-12</sup>. Moreover, most of the literature is from the western countries. There is limited data available from India. Each population is different constitutionally and behavior wise. Thus, it is of great importance to try to find out possible etiological factors

in our population. This study was aimed to find out the association between hysterectomy and urinary incontinence.

**Aim:** To study the association between hysterectomy and urinary incontinence

**Material and methods:** Between October 2020 and April 2022, 320 consecutive women presenting to various Outpatient Departments of KCGMC, Karnal and meeting the inclusion criteria were enrolled in a cross sectional comparative study.

**Inclusion criteria**

Group A: Women aged 45 years and above, who underwent hysterectomy, for a benign condition, at least 12 months prior .

Group B :Women aged 45 years and above, with uterus in situ

Women with history of hysterectomy for a malignancy or genito-urinary fistulae were excluded from the study.

Ethical committee approval was obtained via letter no KCGMC/IEC/2020/34

**Sample size calculation:**

The study of Anderson et al, observed that urinary incontinence was seen in 29.8% post hysterectomy women. Taking these values as reference and assuming the difference of 15% between post hysterectomy and non-hysterectomy women, the minimum required sample size with 80% power of study and 5% level of significance is 153 patients in each study group. To reduce margin of error, total sample size taken is 320 (160 patients per group).

Formula used is:-

$$n \geq \frac{((pc*(1-pc)+pe*(1-pe))*(Z\alpha + Z\beta)^2)}{(pc-pe)^2}$$

pc= urinary incontinence in post hysterectomy

pe=urinary incontinence in non-hysterectomy women

Where  $Z\alpha$  is value of Z at two sided alpha error of 5% and  $Z\beta$  is value of Z at power of

80%.

Calculations:-

$$n \geq ((.298*(1-.298)+.448*(1-.448))*(1.96+.84)^2)/(.298-.448)^2$$

$$\geq 159.06 = 160 (\text{approx.})$$

All the participants were explained about the study by the principal investigator, in the language best understood to them and written informed consent was obtained. The socio-demographic and obstetric details of all women were recorded. Details regarding smoking status and co morbidities like diabetes, bronchial asthma and COPD were noted down. If the woman had undergone hysterectomy, the details of the same, as to the route of hysterectomy, indication, whether the ovaries were retained or not and if she was on any hormone therapy, were noted down. If the woman had not undergone hysterectomy, details regarding menopausal status, years of menopause, whether any surgery for removal of both ovaries done or not and if she was on any hormone therapy was recorded. In case the women was not certain about bilateral oophorectomy and hormone therapy, she was asked to send details of her surgical and medical records telephonically.

All women were then subjected to the urogenital distress inventory (UDI)-6 questionnaire which is a standard questionnaire recording urinary frequency, urgency, incomplete voiding, painful micturition, urge incontinence and stress incontinence. The questionnaire also records the severity of the symptoms assessed by its effect on the quality of life. When the answer to any of the above symptoms are in the affirmative, the effect on the quality of life was scored from 1-4, with 1 being not affecting at all and 4 being the quality of life being affected quite a bit. The scale score was calculated and the severity was determined, with

higher scores depicting severe symptoms. Body mass index (BMI) of all the participants was calculated. All these details were recorded on the working proforma.

Using the information provided by the participants by answering UDI-6 questionnaire, the prevalence of urinary incontinence and its severity for each group was calculated. The women were further classified to the type of urinary incontinence that they suffered from as either, stress urinary incontinence, urge urinary incontinence or mixed urinary incontinence, by standard ICS definitions. The prevalence and severity of each type of urinary incontinence was calculated for post-hysterectomy and non-hysterectomy group.

#### Statistical analysis

Categorical variables were presented in number and percentage (%) and continuous variables were presented as mean  $\pm$  SD and median.

Categorical variables were then compared using Chi-Square test. A p value of  $<0.05$  was considered statistically significant.

The data was entered in MS EXCEL spreadsheet and analysis was done using Statistical Package for Social Sciences (SPSS) version 21.0.

#### Results:

A total of 360 women aged 45 years and above were enrolled in the study, out of which 160 women had undergone hysterectomy (Group A) and 160 had uterus in situ (Group B). The two groups were matched with respect to age, socio-economic status, parity, smoking habits and body mass index (Table 1). 71.3% women in the hysterectomy group had undergone hysterectomy under 45 years of age. 40 women in the hysterectomy group and none in the hysterectomy group had undergone bilateral oophorectomy. None of the women was on hormone treatment. Mean age of Group A and Group B was  $51.3 \pm 6.21$  years and  $54.4 \pm 5.23$  years respectively.

Table 1: Socio demographic details of population

Variable	Group A	Group B	p value
<b>Age</b>			
45 to 55 years	88 (55.0%)	76 (47.5%)	0.402
56 to 65 years	53 (33.1%)	61 (38.1%)	
Above 65 years	19 (11.9%)	23 (14.4%)	
<b>Parity</b>			
Nulliparous	5(3.12%)	4(2.5%)	0.735
Parous	155(96.87%)	156(97.5%)	
<b>Literacy status</b>			
Illiterate	103 (64.4.0%)	97 (60.6%)	0.488
Literate	57 (35.6%)	63 (39.4%)	
<b>Residence</b>			
Urban	49 (30.6%)	54 (33.7%)	0.550
Rural	111 (69.4%)	106 (66.3%)	
<b>Socioeconomic status</b>			
I (Upper)	5 (3.12%)	4 (2.5%)	0.945
II (Upper middle)	64 (40.00%)	61 (38.12%)	
III (Lower middle)	74 (46.25%)	79 (49.37)	
IV (Upper lower)	17 (10.62%)	16 (10.0%)	

<b>BMI</b>			
<b>Underweight (Below18.5)</b>	13(8.12%)	6(3.75%)	.247
<b>Normal (18.5to24.9)</b>	26(16.25%)	26(16.25%)	
<b>Overweight (25to29.9)</b>	75(46.8%)	70(43.75%)	
<b>Obese (Above30)</b>	46(28.7%)	58(36.25%)	
<b>Smoking status</b>			
<b>Smoker</b>	79(49.4%)	71(44.4%)	0.370
<b>Non-Smoker</b>	81(50.6%)	89(55.6%)	

The prevalence of urinary incontinence in group A and Group B was found to be 44.4% and 41.9% respectively ( $p=0.652$ ). There was no statistically significant difference between the two groups with respect to prevalence of urinary incontinence ( $p$  value =0.652) (Table 2).

**Table 2. Prevalence of urinary incontinence in group A and group B**

<b>Urinary Incontinence</b>	<b>Group A</b>	<b>Group B</b>	<b>p value</b>
Yes	71 (44.4%)	67 (41.9%)	0.652
No	89 (56.6%)	93 (58.1%)	
<b>Total</b>	<b>160</b>	<b>160</b>	-

Among the women who experienced urinary incontinence, the type of urinary incontinence was studied. In the hysterectomy group, 37% of women experienced stress urinary incontinence, 35.2% mixed urinary incontinence and 26.8% had urge urinary incontinence. The prevalence of stress urinary incontinence, mixed urinary incontinence and urge urinary incontinence in the non hysterectomy group was found to be 32.8%, 25.3% and 41.8% respectively. No significant difference was found in the two groups with respect to the type of urinary incontinence (Table 3).

**Table 3: Type of urinary incontinence in group A and group B**

Urinary Incontinence	Group A	Group B	p value
Stress urinary incontinence	27 (37.0%)	22 (83.8%)	.713
Urge urinary incontinence	19 (26.8)	17 (25.4%)	
Mixed urinary incontinence	25 (35.2%)	28 (41.8%)	
Total	71 (100%)	67 (100%)	-

UDI scoring was done in the participants to study the impact of urinary symptoms on their quality of life. 96(60%) patients of group A and 103(64.5%) patients of group B had UDI score ranging 0-25, these patients were either asymptomatic or minimally disabled. 21(13.12%) patients of group A and 35(21.87%) patients of group B had UDI scoring 26-50. 31(31.12%) patients of group A and 20(12.5%) patients of group B had UDI scoring ranging 50-75. 12(7.5%) patients of group A and 2(1.25%) patients of group B had UDI scoring ranging 75-100 and were severely disabled (Table 4).



**Table 4: Urogenital distress inventory (UDI)-6 score in group A and group B**

UDI-6 Score points	UDI 6 Score (on 0-100scale)	Group A	Group B	p value
0 to 6	0-25	96 (60%)	103 (64.5%)	.003**
7 to 12	26-50	21 (13.12%)	35 (21.87%)	
13 to 18	51-75	31 (19.3%)	20 (12.5%)	
19 to 24	76-100	12 (7.5%)	2 (1.25%)	
<b>Total</b>		160	160	

Most of the patients of non hysterectomy group had smaller UDI scoring (i.e. mostly faced no or minimal disability). Patients of post hysterectomy group had larger UDI scoring and faced more distress due to urinary symptoms. The difference was statistically significant ( $p=0.003$ ) (Table 4).

### Discussion:

Among 160 women who had undergone hysterectomy, 71(44.4%) women had urinary incontinence and 89 (56.6%) did not face any such problem. While among women who had not undergone hysterectomy, 67 (41.9%) had urinary incontinence and 93(58.1%) did not have urinary incontinence. The difference was insignificant ( $p$  value =0.652). Maria C. et. al.<sup>11</sup> performed a prospective cohort study in Christian Medical College and Hospital, Vellore, Tamil Nadu and reported the prevalence of urinary incontinence among post-menopausal women as 46.24%. The prevalence of urinary incontinence amongst the women with natural menopause and those with surgical menopause was 47.3% and 45% respectively. The difference was not statistically significant ( $p = 0.566$ ). KA Skorupska et al<sup>12</sup> reported that urinary incontinence developed within 12 months after hysterectomy in 38% of 392 women. None had symptoms prior to surgery.

In a meta-analysis, Brown et al<sup>9</sup> found a significant increase in the odds of incontinence after hysterectomy. As per studies of Uma et. al.<sup>3</sup> and Danforrh et al<sup>13</sup> hysterectomy found to be significantly associated with overall incontinence. They concluded that this association is due to surgical trauma caused when uterus and cervix are severed from pelvic floor supportive tissues at the time of hysterectomy. Hysterectomy could interfere with the urethral sphincter mechanism by damaging distal branches of pudendal nerves and inferior hypogastric plexus.

In the present study, there was no statistically significant difference in the prevalence of urinary incontinence in the hysterectomy and uterus in situ group. In a recent study by K Skorupska et al<sup>14</sup>, no statistically significant difference in urinary incontinence symptoms was reported in the patients before and twelve months after hysterectomy. Before surgery, 137 out of 399 (34.3%) patients had urinary incontinence symptoms; afterwards, 139 (34.8%) indicated the same ( $p > 0.05$ ).

In the present study, there was statistically significant difference in the two groups with respect to UDI-6 scores. Most of the patients of non hysterectomy group had smaller UDI scoring (i.e. mostly faced no or minimal disability), Patients of post hysterectomy group had larger UDI scoring. Our results showed that distress due to urinary symptoms is higher in post hysterectomy group. S. Selcuk Et al<sup>15</sup> also reported significantly higher irritative and obstructive scores in the simple hysterectomy group compared to the control group. In a study done by Tan C et al<sup>16</sup>, total hysterectomy was found to remarkably improve lower urinary tract symptoms in uterine adenomyosis patients in the short period but did not improve the long-term outcome. One year UDI score was comparable to baseline score in these patients.

## References

1. Abrams P, Cardozo L, Fall M, Griffiths D, Rosier P, Ulmsten U, et al. The standardisation of terminology in lower urinary tract function: report from the standardisation sub-committee of the International Continence Society. *Urology*. 2003;61(1):37–49.
2. Hunskar S, Arnold EP, Burgio K, Diokno AC, Herzog AR, Mallett VT. Epidemiology and natural history of urinary incontinence. *Int Urogynecol J Pelvic Floor Dysfunct*. 2000;11(5):301-19. doi: 10.1007/s001920070021. PMID: 11052566.

3. Singh U, Agarwal P, Verma ML, Dalela D, Singh N, Shankhwar P. Prevalence and risk factors of urinary incontinence in Indian women: A hospital-based survey. *Indian J Urol IJU J Urol Soc India.* 2013;29(1):31–6.
4. Bushnell DM, Martin ML, Summers KH, Svihra J, Lionis C, Patrick DL, et al. Quality of life of women with urinary incontinence: Cross-cultural performance of 15 language versions of the I-QOL. *Qual Life Res* 2005;14:1901-13
5. Bodhare TN, Valsangkar S, Bele SD. An epidemiological study of urinary incontinence and its impact on quality of life among women aged 35 years and above in a rural area. *Indian J Urol*2010;26:353-8.
6. Andersen LL, Alling Moller LM, Gimbel H. Comparison of subtotal vs. total abdominal hysterectomy regarding pelvic organ prolapse and urinary incontinence; a randomized control trial with 14 year follow up. *Eur J ObstetGynecolReprod Biol.*2015;193:40-45
7. Burgio KL, Matthews KA, Engel BT. Prevalence, incidence and correlates of urinary incontinence in healthy, middle-aged women. *J Urol.* 1991;146:1255–9.
- 8 Samuelsson E, Victor A, Tibblin G. A population study of urinary incontinence and nocturia among women aged 20-59 years. Prevalence, well-being and wish for treatment. *ActaObstetGynecol Scand.* 1997;76:74–80.
9. Brown JS, Sawaya G, Thom DH, Grady D. Hysterectomy and urinary incontinence: A systematic review. *Lancet.* 2000;356:535–9.
10. Kudish BI, Shveiky D, Gutman RE, Jacoby V, Sokol AI, Rodabough R, et al. Hysterectomy and urinary incontinence in postmenopausal women. *IntUrogynecology J.* 2014 Nov;25(11):1523–31.
11. Maria C. Alexander, Vaibhav Londhe, Emily D. Ebenezer, Aruna N. Kekre, Visalakshi Jeyaseelan. Is hysterectomy a risk factor for urinary incontinence? *Int J Reprod Contracept Obstet Gynecol.* 2019 Apr;8(4):1260-1265

12. Skorupska, K.; Miotła, P.; Kubik-Komar, A.; Rechberger, E.; Adamiak-Godlewska, A.; Rechberger, T. Urinary incontinence after hysterectomy- does type of surgery matter? *Ginekol. Polska* 2016, 87, 94–97. [Google Scholar] [CrossRef]

13. Skorupska, K.; Wawrysiuk, S.; Bogusiewicz, M.; Miotła, P.; Winkler, I.; Kwiatkowska, A.; Rechberger, T. Impact of Hysterectomy on Quality of Life, Urinary Incontinence, Sexual Functions and Urethral Length. *J. Clin. Med.* 2021, 10, 3608. <https://doi.org/10.3390/jcm10163608>

13. Danforth KN, Townsend MK, Lifford K, Curhan GC, Resnick NM, Grodstein F. Risk factors for urinary incontinence among middle-aged women. *Am J Obstet Gynecol.* 2006 Feb;194(2):339-45. doi: 10.1016/j.ajog.2005.07.051. PMID: 16458626; PMCID: PMC1363686.

14. Skorupska, K.; Wawrysiuk, S.; Bogusiewicz, M.; Miotła, P.; Winkler, I.; Kwiatkowska, A.; Rechberger, T. Impact of Hysterectomy on Quality of Life, Urinary Incontinence, Sexual Functions and Urethral Length. *J. Clin. Med.* 2021, 10, 3608. <https://doi.org/10.3390/jcm10163608>

15. S. Selcuk, C. Cam, M.R. Asoglu, M. Kucukbas, A. Arinkan, M.S. Cikman, *et al.* Effect of simple and radical hysterectomy on quality of life - analysis of all aspects of pelvic floor dysfunction. *Eur J Obstet Gynecol Reprod Biol.* 2016; 19884-19888

16. Tan C, Yang X, Wang Y, Qian S. Change in Lower Urinary Tract Symptoms after Hysterectomy in Uterine Adenomyosis and Uterine Myoma Patients- A Prospective and Comparative Study with 1-year Followup. *Clin Surg.* 2019; 4: 2617.

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