

Urinary incontinence after hysterectomy – does the type of surgery matter?

Nietrzymanie moczu po histerektomii – czy typ zabiegu ma znaczenie?

Katarzyna Skorupska¹, Paweł Miotła¹, Agnieszka Kubik-Komar², Ewa Rechberger¹,
Aneta Adamiak-Godlewska¹, Tomasz Rechberger¹

¹ 2nd Department of Gynecology, Medical University of Lublin, Poland

² Department of Applied Mathematics and Computer Science, University of Life Science, Poland

Abstract

Objectives: The aim of the study was to assess the effect of different types of hysterectomy on the development of postoperative urinary incontinence (UI).

Material and methods: the study group consisted of 392 women who underwent supracervical laparoscopic hysterectomy (SLH), total abdominal hysterectomy (TAH), supracervical abdominal hysterectomy (SH), or vaginal hysterectomy (VH) for benign indications between 2010 and 2013. The patients reported no UI-related complaints before surgery. UI status was assessed 12 months postoperatively using the cough test and the 24-hour pad test.

Results: UI developed within 12 months after surgery in 149 (38%) out of 392 women. No statistically significant correlation between the type of treatment and UI incidence was detected. The percentage of patients affected by UI did not differ between the study groups.

Conclusions: Hysterectomy constitutes a risk factor for the development of urinary incontinence but the occurrence of postoperative UI does not depend on the type of surgery.

Key words: **urinary incontinence / abdominal hysterectomy /
/ laparoscopic hysterectomy / vaginal hysterectomy /**

Autor do korespondencji:

Katarzyna Skorupska
II Klinika Ginekologii SPSK 4
20-954 Lublin, Poland
tel: +48 604418512
e-mail: kasiaperzylo@hotmail.com

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Streszczenie

Cel pracy: Ocena wpływu różnych typów histerektomii na występowanie nietrzymania moczu (UI - ang. urinary incontinence) po operacji.

Metody: Grupa badana składała się z 392 pacjentek, u których wykonano nadszyjkową histerektomię laparoskopową (SLH- ang. supracervical laparoscopic hysterectomy), całkowitą brzuszną histerektomię (TAH- ang. total abdominal hysterectomy), nadszyjkową histerektomię brzuszną (SH - ang. supracervical abdominal hysterectomy) lub histerektomię pochwową (VH - vaginal hysterectomy) z powodu zmian łagodnych w latach 2010- 2013. Pacjentki przed operacją nie zgłaszały objawów nietrzymania moczu. Występowanie UI oceniono 12 miesięcy po operacji przy pomocy testu kaszlowego i 24-godzinnego testu podpaskowego.

Wyniki: U 149 z 392 pacjentek (38%) stwierdzono występowanie nietrzymania moczu 12 miesięcy po operacji. Nie stwierdzono istotnej statystycznie różnicy pomiędzy typem zabiegu a występowaniem nietrzymania moczu. Odsetek pacjentów dotkniętych UI nie różnił się pomiędzy badanymi grupami.

Wnioski: Histerektomia jest czynnikiem ryzyka występowania UI, jednak występowanie pooperacyjnego nietrzymania moczu nie zależy od typu wykonanego zabiegu.

Słowa kluczowe: **nietrzymanie moczu / histerektomia pochwoowa /
/ histerektomia laparoskopowa / histerektomia brzuszna /**

Introduction

Hysterectomy is the second most common gynecological surgery in the world. There are various methods of conducting this operation – traditional, with abdominal and vaginal approach, as well as laparoscopic. Most of hysterectomies are performed due to non-oncologic causes, which improves the quality of life (QoL) of the affected individuals, but does not contribute to prolonging their lives. Hysterectomy, due to the violation of the integrity of the muscle and the connective tissue of the pelvic floor, as well as possible partial denervation of the bladder (documented for total abdominal hysterectomy), constitutes a risk factor for postoperative functional symptoms in the lower urinary tract (stress urinary incontinence – SUI/overactive bladder – OAB) [1, 2, 3, 4]. Theoretically, differences in the extent of the damage can be explained by the fact that hysterectomies are performed via different surgical routes, i.e. abdominal, vaginal, laparoscopic, and combined.

The aim of the study was to investigate possible differences in the development of UI after various types of hysterectomies.

Material and methods

The study group included 392 otherwise healthy women who underwent various types of hysterectomy: SLH (n=100), TAH (n=97), SH (n=98), or VH (n=97) for benign indications (leiomyomata, adenomyosis), between January 2010 and June 2013 at the Second Department of Gynecology, Medical University of Lublin. Patient age ranged from 40 to 65 years. The patients had no history of UI-related complaints and anti-incontinence surgery. During the follow-up visit, 12 months postoperatively, all women answered the following question: ‘Do you suffer from urinary incontinence?’. In order to objectively confirm incontinence, the cough test in supine position, with comfortably full bladder (250ml), was performed in all patients who gave the affirmative answer. We did not identify different kinds of urinary incontinence. Moreover, all patients suffering from UI completed the King’s Health Questionnaire (KHQ). Local Ethics Committee approved the study protocol.

Main outcome measures

UI status was assessed 12 months postoperatively using patient medical history, and confirmed objectively with the cough test. Additionally, all UI patients were asked to complete the standardized, validated KHQ questionnaire (the Polish version) in order to evaluate the impact of symptoms from the lower urinary tract on their quality of life (QoL). KHQ is composed of 21 questions which are grouped into two parts: GH (General Health) and II (Incontinence impact), with several sub-domains: RE (Role Emotional), RP (Role Physical), SL (Social Limitations), PR (Personal Relationships), E (Emotions), S/E (Sleep/Energy), and SM (Severity of Symptoms).

Statistical analysis

Statistical analysis was performed using Statistica 10 software. The normality of data distribution was assessed using Shapiro-Wilk test. Due to the significant deviation from normal distribution, the non-parametric Kruskal-Wallis test was applied to explore the significant differences in the responses of the KHQ test among the SLH, SH, TAH and VH groups. In the case of rejection of the null hypothesis, the post-hoc test (two-sided) of multiple comparisons of average ranks was used. The relationship between the type of surgery and UI was tested using the χ^2 test. The level of statistical significance for all tests was $\alpha=0.05$.

Results

Patient demographic characteristics did not differ significantly among the study groups (Table I). Postoperative development of UI was confirmed in 33 patients after LSH, 42 after TAH, 33 after TVH, and 41 after SH.

Statistical analysis revealed no statistically significant correlation between the type of hysterectomy and the development of postoperative UI ($\chi^2=3.48$; $p=0.32$).

The results of the statistical analysis of KHQ answers for each of the investigated domains are presented in Table II. The H value was compared with the χ^2 value of χ for k-1 degrees of freedom. When the four groups were compared (k=4) with

Table I. Demographic characteristics of patients from study group.

Hysterectomy type	MEAN AGE (years)	MEAN BMI (kg/m ²)	MEAN PARITY N±SD
LSH (n=100)	47.41±4.59	26.88±5.82	2.57±1.32
TAH (n=97)	50.5±5.27	28.76±6.34	2.51±1.28
VH (n=97)	50.1±4.98	28.97±7.41	2.69±1.37
SH (n=98)	47.4±4.86	27.58±6.19	2.63±1.33

Table II. The results of KHQ questionnaire answers.

Domain	Kruskal-Wallis test value (H)	p value
GH	9,09	p =0,0281*
II	7,52	p =0,0570
RL	13,30	p =0,0040*
PL	6,97	p =0,0728
SL	2,28	p =0,5168
PR	0,4	p =0,9397
E	1,85	p =0,6048
S/E	4,53	p =0,2091
SM	3,89	p =0,2738

* the occurrence of statistically significant difference between groups on the 0.05 level

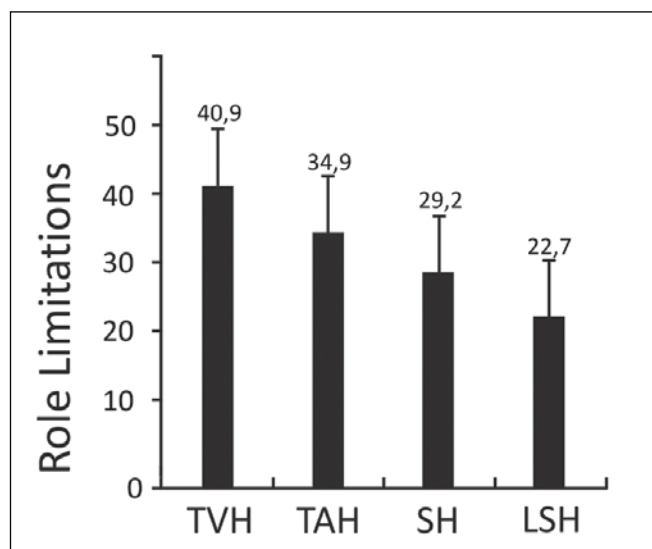


Figure 1. The numerical values of the variable RL in patients from study groups.

the assumption of the significance level $\alpha = 0.05$, the value of χ^2 is approximately 7.81. If this value was greater than the calculated H value, no significant differences between the groups were observed.

The value of the Kruskal-Wallis test for the RL variable was $H=9.09$, indicating statistically significant differences in this variable between the study groups ($p < 0.05$). Despite that fact, the post hoc test indicated no significant differences between the study groups. The smallest p-value = 0.06 (on a the borderline of statistical significance) was found between the LSH and TVH groups.

The value of the Kruskal-Wallis test for the RL variable was $H=13.30$, indicating statistically significant differences in this variable between the study groups ($p < 0.05$). The post hoc test indicated a statistically significant difference between the LSH and TVH groups, in favor of LSH (Figure 1).

No statistically significant differences were observed for other domains in terms of responses to the KHQ questions between the study groups observed for other domains.

Discussion

To the best of our knowledge, the influence of various types of hysterectomy on the incidence of postoperative development of UI in the population of Polish women has never been reported. On the other hand, the incidence of UI in the general population of women differs depending on the methodology of the study taken into account. Overall, 13% of the women in the FECOND study (5017 women aged 15-49 years), 24% in the Barometer study (3089 women aged 40-85 years), 15% in the GAZEL general survey (3098 women aged 54-69 years), 39% in the GAZEL urinary survey, and 1.5% in the NutriNet survey (85 037 women aged 18-87 years) reported any UI type [5]. Hysterectomy is associated with few complications and generally is linked with marked improvement in the health-related QoL. Regardless, this type of surgery is considered as a risk factor for UI [1, 2]. The removal of the uterus, with no recognized pathologies during the surgical treatment of pelvic organ prolapse does not improve the results of the treatment. The Polish Society of Obstetrics and Gynecology does not recommend routine hysterectomy during pelvic organ prolapse and stress urinary incontinence (SUI) surgery [6]. In our study, one year postoperatively we observed urinary incontinence in 149 women, representing 38% of the respondents: 33 patients after LSH, 42 after TAH, 33 after TVH, and 41 after SH. Noteworthy, we did not find any statistically significant differences between the type of surgery and the incidence of postoperative UI, which was consistent with the results previously published by Thakar et al. These authors compared the frequency of micturition, symptoms of SUI, bladder capacity and dysuria in patients after hysterectomy. They also performed an urodynamic study before, 6, and 12 months after SH and TAH. During these periods of time, the patients also filled in a questionnaire assessing symptom severity. They found a similar reduction in symptom frequency in both groups and an increase in the volume of the bladder without any differences in UI among patients after SH and TAH [7].

The findings of the analysis of 9 randomized trials involving 1.553 patients conducted by Lethaby et al., were also confirmed by our observations. These authors analyzed patients who underwent TAH and SH via the abdominal and laparoscopic

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routes. They concluded that the occurrence of the following: stress incontinence, incomplete emptying of the bladder, and urgency after 2 years were not different in both study groups [8].

On the other hand, different results were reported by Gimbel et al. In their survey of 140 women after TAH and 136 after SH, conducted 12 months after surgery, they found that the number of women with symptoms of incontinence was significantly higher in the SH group as compared to TAH ($p=0.043$). These authors found that the lower rate of women with UI symptoms after TAH was the result of a greater relief of symptoms (20/140 and 14/136 in the TAH and SH groups, respectively), and a lower percentage of women with new symptoms (3/140 and 10/136 in the TAH and SH groups, respectively). However, they indicated that before the survey in the group of patients deemed eligible for SH included a higher number of women with low scores in the QoL test as compared to patients from the TAH group [9]. A randomized, multicenter study by Anderson et al., which lasted 14 years, compared the effect of TAH ($n=158$) and SH ($n=161$) on the incidence of UI and found that UI was more common in women after SH (33%) as compared to TAH (20%). However, this difference disappeared after a multiple imputation analysis [10]. Our results are partially consistent with the findings of Lakeman et al., who compared abdominal hysterectomy (TAH and SH; $n=318$) with vaginal hysterectomy (TVH $n=112$) for the occurrence of lower urinary tract symptoms (LUTS). After 6 months and 3 years postoperatively, 86 patients after TVH and 246 patients after TAH and SH filled in the questionnaires. In the second group, SH was performed in 33% and TAH in 67% of the patients. There were no differences in the prevalence of LUTS between SH and TAH. However, statistically significant differences in the incidence of LUTS were detected between patients after abdominal hysterectomy when compared to TVH group. However the risk of LUTS was twice as high in the TVH group [11]. In a retrospective single-center study, Müller et al., evaluated long-term effects of abdominal hysterectomy (AH) ($n=178$), TVH ($n=74$), LAVH ($n=87$), LSH ($n=229$), and TLH ($n=413$) performed due to benign lesions on the development of UI. They found no differences in the prevalence of UI symptoms after surgery, regardless of its type, which was consistent with our results [12]. The authors of a Swedish cohort study assessed the impact of hysterectomy on the risk of SUI symptoms based on the national survey including 165 260 patients after hysterectomy (TAH, SH, TVH, LAVH) and 479 506 controls over the period of 30 years. They also found no correlation between UI incidence and the type of the surgical procedure [13].

Conclusions

Hysterectomy is a risk factor for postoperative UI, regardless of the type of procedure. Therefore, further research is necessary to identify the risk factors responsible for UI after hysterectomy. Moreover, preventive strategy should be introduced in patients who are at risk of postoperative UI. Currently, the only generally available preventive strategy is pelvic muscle training, which should be advised in all patients after hysterectomy, regardless of the type of surgery.

Oświadczenie autorów:

1. Katarzyna Skorupska – autor koncepcji i założeń pracy, przygotowanie manuskryptu i piśmiennictwa, zebranie materiału – autor zgłaszający i odpowiedzialny za manuskrypt.
2. Paweł Miotła – zebranie materiału, współautor tekstu pracy, przygotowanie manuskryptu.
3. Agnieszka Kubik-Komar – analiza statystyczna wyników.
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