



PREVALENCE AND RISK FACTORS OF POSTPARTUM URINARY INCONTINENCE IN SPONTANEOUS VAGINAL DELIVERY AND CESAREAN SECTION

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Abstract : Urinary incontinence is a common gynecological urinary disorder. Spontaneous vaginal delivery (SVD) may increase the risk of postpartum stress incontinence compared to cesarean section (CS). This study aims to analyze the difference in urinary incontinence on the second and seventh postpartum days in patients with SVD and CS to determine the prevalence and relationship between risk factors and postpartum urinary incontinence occurrence. This study is an analytical observational study with a case-control design. The study sample consists of postpartum patients at Adam Malik General Hospital and affiliated hospitals who meet the inclusion and exclusion criteria. The Questionnaire for Urinary Incontinence Diagnosis/QUID and cough test were used to identify stress incontinence on the second and seventh postpartum days. Our results showed that on the second postpartum day, 25 patients with SVD (67.6%) and 13 patients with CS (43.2%) were found to have stress incontinence. Meanwhile, on the seventh postpartum day, 18 patients with SVD (51.4%) and 1 patient with CS (2.7%) were found to have stress urinary incontinence. The statistical analysis showed a significant difference in the occurrence of stress incontinence based on QUID assessment between the SVD and CS groups on the seventh postpartum day ($p = 0.000$), while no significant difference was found in the results of the cough test between the SVD and CS groups ($p = 0.243$). These findings indicate that SVD is identified as a risk factor for stress urinary incontinence, particularly on the seventh day postpartum.

Keywords - Stress urinary incontinence, Spontaneous Vaginal delivery, Cesarean section

I. INTRODUCTION

Stress urinary incontinence is a common gynecological condition. It occurs when there is unintentional leakage of urine due to the opening of the external urethra caused by increased abdominal pressure. It has been reported that 25% to 55% of pregnant women experience symptoms of urinary incontinence, and the incidence of stress incontinence after vaginal delivery is 3.7%.¹

Vaginal delivery increases the risk of stress incontinence in the first year postpartum compared to cesarean section surgery.² Specifically, spontaneous vaginal delivery increases the risk of pelvic floor dysfunction by damaging the pelvic nerves and causing lacerations in the pelvic muscles.³ Previous studies have shown that elective cesarean section can reduce the rate of urinary incontinence but may be a cause of maternal complications, including bladder injuries.⁴

Furthermore, postpartum stress incontinence has a negative impact on the quality of life for women who have undergone vaginal delivery.⁵ More severe symptoms of urinary incontinence and the presence of prolapse have a negative impact on the postpartum quality of life for women.⁶ Therefore, in this study, we conducted an analysis of the differences in urinary incontinence on the second and seventh days postpartum in patients who had undergone SVD and CS to determine the prevalence and relationship between risk factors and postpartum urinary incontinence

II. METHODS

2.1 Study Design and Sample Population

This study is an analytical observational study with a case-control design conducted at the Department of Obstetrics and Gynecology, Adam Malik General Hospital, and affiliated hospitals, from March 2023 until the required sample size is achieved. The study sample includes patients who meet the inclusion criteria, namely those who have undergone SVD at Adam Malik General Hospital and affiliated hospitals, and those who have undergone CS at Adam Malik General Hospital and affiliated hospitals. Patients with twin pregnancies, premature deliveries, assisted deliveries (using forceps/vacuum), a history of urinary tract infections, and a history of urinary incontinence before pregnancy are excluded from this study. Sample collection is carried out using non-probability sampling, specifically consecutive sampling technique.

2.2 Data Collection and Patient Characteristics

Patient recruitment was conducted in the postpartum ward and outpatient clinic. The frequency distribution of patient characteristics (age, parity, Body Mass Index/BMI, comorbidities, smoking history) was documented from medical records. Patients were classified based on the method of delivery (SVD and CS), and the duration of the second stage of labor, the need for episiotomy, and the degree of perineal tear were documented. After the baby was born, the weight of the newborn was recorded.

2.3 Measurement and Classification of Urinary Incontinence

The Questionnaire for Urinary Incontinence Diagnosis (QUID), consisting of 6 questions, was filled out. Each question was assigned a value from 0 (Never) to 5 (Every time). The answers to questions 1, 2, and 3 were summed to obtain the Stress score, while the answers to questions 4, 5, and 6 were summed to obtain the Urge score. Subsequently, a cough test was performed after instructing the patients to urinate spontaneously and drink two glasses of water (16 oz = 450 ml) prior to the test. Two hours later, the cough test was conducted. Patients were asked to cough forcefully in the lithotomy position. The cough test was considered positive if urine leakage was observed from the external meatus of the urethra. If no urine leakage was observed during the cough test in the lithotomy position, the test was repeated in the standing position. In this study, patients were considered to have stress incontinence if they answered 'yes' to questions 1, 2, and 3 on the QUID questionnaire and had a positive cough stress test.

2.4 Data Analysis and Statistical Methods

The data was analyzed using descriptive methods to examine the frequency distribution of the study subjects based on their characteristics. Furthermore, a bivariate analysis was performed to assess the differences in urinary incontinence on the second and seventh day postpartum between patients who underwent SVD and CS. Bivariate analysis utilized the Chi-square test or Fisher's exact test if the data did not meet the requirements for the Chi-square test. Statistical significance was determined at $p < 0.05$, with a confidence level of 95%.

III. RESULTS AND DISCUSSION

3.1 Results

In this study, a total of 74 patient samples were obtained, divided into 37 patients who underwent SVD and 37 patients who underwent CS.

Table 3.1: Sample Characteristics

Parameter	SVD (n=37)	CS (n=37)	<i>p value</i>
Age (years)			0.373
<20	3 (8.1%)	1 (2.7%)	
20-29	19 (51.4%)	16 (43.2%)	
≥30	15 (40.5%)	20 (54.1%)	
Parity			0.706
Primigravida	22 (59.5%)	18 (48.6%)	
Secondigravida	8 (21.6%)	8 (21.6%)	
Multigravida	6 (16.2%)	10 (27.0%)	
Grandmultigravida	1 (2.7%)	1 (2.7%)	
BMI			0.326
<i>Underweight</i>	0 (0.0%)	1 (2.7%)	
<i>Normoweight</i>	27 (73.0%)	24 (64.9%)	
<i>Overweight</i>	8 (21.6%)	6 (16.2%)	
<i>Obese</i>	2 (5.4%)	6 (16.2%)	
Comorbidities			0.331
None	32 (86.5%)	28 (75.7%)	
Hypertension in pregnancy	2 (5.4%)	6 (16.2%)	
Diabetes mellitus	3 (8.1%)	3 (8.1%)	
History of Smoking			-
Yes	0 (0.0%)	0 (0.0%)	
No	37 (100.0%)	37 (100.0%)	

Based on the sample characteristics (Table 3.1), it can be observed that the majority of patients who underwent SVD were aged 20-29 years (51.4%), primigravida (59.5%), of normoweight (73.0%), without comorbidities (86.5%), and non-smokers (100.0%). In the CS group, it was found that the majority of patients were aged ≥30 years (54.1%), primigravida (48.6%), of normoweight (64.9%), without comorbidities (75.7%), and non-smokers (100.0%). The comparison of characteristics between the two groups using statistical tests indicated no significant differences ($p > 0.05$).

Table 3.2: Additional characteristics of the sample undergoing PSP

Characteristics	Number (%)
Duration of the second stage of labor	
≤30 minutes	28 (75.7%)
>30 minutes	9 (24.3%)
Episiotomy	
Yes	16 (43.2%)
No	21 (56.8%)
Perineal laceration	
First-degree	13 (35.1%)
Second-degree	24 (64.9%)

In Table 3.2, it can be observed that 28 patients (75.7%) had a second stage of labor lasting ≤ 30 minutes. Episiotomy was performed on only 16 out of 37 patients (43.2%). A total of 13 patients (35.1%) experienced first-degree perineal laceration, while 24 patients (64.9%) experienced second-degree laceration.

Table 3.3: Comparison of stress urinary incontinence based on postpartum days

Stress Incontinence	SVD (n=37)	CS (n=37)	<i>p value</i>
Postpartum Day 2			0.061
Yes	25 (67.6%)	16 (43.2%)	
No	12 (32.4%)	21 (56.8%)	
Postpartum Day 7			0.000*
Yes	19 (51.4%)	1 (2.7%)	
No	18 (48.6%)	36 (97.3%)	

Based on the QUID scoring (Table 3.3) on the second postpartum day, it was found that 25 patients (67.6%) in the PSP group and 16 patients (43.2%) in the SC group experienced urinary incontinence. However, the statistical test results showed no significant difference in the occurrence of urinary incontinence between the PSP and SC groups on the second postpartum day ($p > 0.05$). On the seventh postpartum day, it was found that 19 PSP patients (51.4%) and only 1 SC patient (2.7%) experienced urinary incontinence. The statistical test results demonstrated a significant difference in the occurrence of urinary incontinence between the two groups on the seventh postpartum day ($p < 0.05$).

Table 3.4. Comparison of cough test results

Cough Test	SVD (n=37)	CS (n=37)	<i>p value</i>
Positive	23 (62.2%)	17 (45.9%)	0.243
Negative	14 (37.8%)	20 (54.1%)	

Based on the cough test assessment (Table 3.4), positive results were found in 23 patients (62.2%) in the SVD group and 17 patients (45.9%) in the CS group. However, statistical analysis showed no significant difference in cough test results between the two groups ($p > 0.05$).

3.2 Discussion

In this study, it was found that age, parity, BMI, and comorbidities were not significant risk factors for urinary incontinence ($p > 0.05$). However, a study by Dinc et al. reported that age was associated with urinary incontinence ($p = 0.046$). In their study, 32% of the samples aged ≤ 19 , 38.1% aged 20-29, and 47.2% aged ≥ 30 experienced urinary incontinence. The prevalence of incontinence in women is known to increase with age.⁷ Similar findings were reported by Pratiwi et al. at Prof. Dr. R. D. Kandou Hospital in Manado. In their study, 47.22% of the samples with stress incontinence were aged ≥ 35 . Further analysis showed a significant association between age and the risk of stress incontinence ($p = 0.008$; OR = 3.509, 95% CI: 1.389-8.868).⁸

Previous studies have reported that high BMI or retaining excess weight in the 6 months postpartum significantly increases the risk of incontinence. Conversely, postpartum weight loss significantly reduces the risk of incontinence, even with other risk factors.⁹ The same results were reported by the study of Waqiah et al. at Dr. Wahidin Sudirohusodo Hospital in Makassar. According to their study, BMI was a risk factor associated with urinary incontinence. Previous studies have shown that women with a BMI ≥ 30 kg/m² have a significantly higher risk compared to those with a BMI < 20 kg/m².¹⁰

In a meta-analysis study by Zhou et al., a relationship between parity and urinary incontinence was found. Eight cohort studies and five case-control studies were included in the meta-analysis. It was found that the odds ratios for women with parity 1, 2, and ≥ 3 were 1.43 [95% CI: 0.90-2.28], 1.50 [95% CI: 1.02-2.20], and 1.58 [95% CI: 1.22-2.03], respectively. Subgroup analysis in the study found that parity was associated with the risk of stress incontinence (OR = 2.32, 95% CI: 1.41-3.81). These findings suggest an overall increased risk due to the number of parities.¹¹

Pregnancy itself increases the prevalence of urinary incontinence by 10%. Furthermore, vaginal delivery increases the prevalence of this condition to 13%. Based on the literature, CS reduces the prevalence of incontinence by up to 30% and reduces the severity of incontinence by 35-52%.¹² In a prospective cohort study conducted by Kokabi and Yazdanpanh, it was found that women who underwent vaginal delivery had a significantly higher risk of experiencing postpartum stress incontinence compared to those who underwent CS. Episiotomy, infant birth weight, and high BMI were also significantly correlated with the occurrence of stress incontinence.¹³ According to Waqiah et al., in a study involving 84 women with postpartum stress incontinence after vaginal delivery and cesarean section, there was a significant difference between the delivery method and postpartum stress

incontinence. Perineal tear grade 1-2, BMI, birth weight, and head circumference significantly influenced postpartum stress urinary incontinence.¹⁰

Overall, instrumental vaginal delivery significantly impacts the prevalence of stress incontinence following childbirth. The prevalence of this condition is also quite high in women who undergo instrumental vaginal delivery for the first time.¹⁴ This theory was further investigated by Tahtinen et al. In their study, a comparison was made between various methods of instrumental vaginal delivery, including spontaneous delivery, vacuum extraction, and forceps. The study found a higher risk of stress incontinence in instrumental vaginal deliveries using vacuum extraction (OR = 2.08; 95% CI: 0.84-5.11) and forceps (OR = 1.16; 95% CI: 0.33-4.08).¹⁵

There are several limitations in this study. Firstly, the sample size was relatively small, which could lead to different results compared to previous studies. Secondly, the assessment of stress incontinence in this study was only conducted up to the 7th day postpartum, and there was no evaluation of long-term effects. Therefore, future studies with longer follow-up periods are needed to improve the accuracy of the research findings.

III. CONCLUSION

Based on the findings of this study, it can be concluded that age, parity, BMI, and comorbidities are not significant risk factors for the occurrence of postpartum stress urinary incontinence. However, SVD was identified as a risk factor for stress urinary incontinence, particularly on the 7th postpartum day.

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