Research article

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Stress urinary incontinence in postpartum women and related factors at Hung Vuong Hospital

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Abstract

Introduction: Stress urinary incontinence has not received much attention in Vietnam yet. It is noted in the literature that urinary incontinence can be present during pregnancy and increases after delivery.

Objectives: To determine the proportion of women with urinary incontinence during exercise 4-12 weeks postpartum and influencing factors.

Methods: A Cross-sectional study on 283 cases of postpartum at 4-12 weeks at Hung Vuong hospital from January 2021 to June 2021.

Results: (1) The prevalence of postpartum UI and SUI among women 4-12 weeks postpartum was 12.7%, with 95% CI [9.2-16.3] and 15.9%, with 95% CI [12.0-20.1]. (2) Factors associated with postpartum SUI are: vaginal delivery with ORadj = 5.18, 95% CI [1.9-14.1], p=0.001. Multiple vaginal births with ORadj = 3.77, 95% CI [1.18-12.0], p=0.025. Urinary incontinence during pregnancy with ORadj = 3.37, 95% CI [1.5-7.3], p=0.002. Caesarean section with ORadj = 0.03, 95% CI [0.002-0.587], p=0.019.

Conclusion: The prevalence of postpartum SUI and UI among women 4-12 weeks postpartum was 15.9%, 12.7% in our research. Injuries to the pelvic floor that disrupt urinary control during pregnancy and postpartum need to be detected early. In addition, noninvasive interventional studies for this condition are needed.

Keywords: Urinary incontinence, Stress urinary incontinence, postpartum.

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1. INTRODUCTION

Urinary incontinence (UI) represents a prevalent and often encountered condition among females. Urinary incontinence is divided into many forms by the International Incontinence Society (ICS) 2019, however, the literature notes that Stress urinary incontinence (SUI) is the most common form of UI in pregnant women, and pregnancy also a major risk factor for the development of this condition. SUI not only affects women's quality of life, making them feel self-conscious, anxious, depressed, reduced work ability, and sexual dysfunction, but also increases the risk of leading to vulvar and vaginal infections, urinary tract infections, etc.

Epidemiological investigations conducted domestically and internationally in recent years have revealed a variable prevalence of postpartum urinary incontinence, ranging from 6% to 33% within the initial three months post-delivery. Notably, the International Continence Society's epidemiological report posits a prevalence estimate of approximately 15-30% within the inaugural year postpartum.

Left unattended, postpartum urinary incontinence poses a persistent clinical challenge, with the majority of symptoms showing scant propensity for spontaneous resolution, often evolving into a chronic state. Contemporary literature, disseminated through reputable scholarly journals, underscores the deleterious impact of chronic urinary incontinence on women's quality of life, spanning disruptions in sleep architecture,

mood disorders, urinary tract infections, and sexual dysfunction.

Guided by the 2010 directive from the American College of Obstetricians and Gynecologists (ACOG), the mitigation and management of urinary incontinence are approached via multifaceted interventions. Among these modalities, pelvic floor exercises have emerged as a cornerstone intervention, demonstrating efficacy in ameliorating both stress and urge urinary incontinence—predominant variants encountered in the postpartum cohort. Notably, in cases of refractory symptoms, therapeutic modalities encompass the utilization of Pessary devices, pharmacotherapy, or surgical interventions.

Within the institutional purview of Hung Vuong Hospital, stress urinary incontinence in the postpartum demographic has received due diligence, with dedicated infrastructure comprising a urogynecology clinic and a pelvic floor muscle training unit. The efficacy of pelvic floor muscle training has been corroborated through empirical investigations conducted by Pham Thi Y Yen in 2012 and Le Hoang Gia in 2017, with observed symptom amelioration rates reaching up to 70% among premenopausal and menopausal cohorts.

However, despite the affirmative outcomes concerning exercise-based interventions, a notable lacuna persists within the institutional research landscape, namely the absence of targeted investigations elucidating the prevalence of postpartum urinary incontinence and its antecedent risk factors throughout the gestational and parturitional continuum. Consequently, there exists an imperative to formulate a cogent strategy aimed at attenuating modifiable risk factors, while concurrently instituting vigilant surveillance and tailored counseling for high-risk postpartum individuals. Such proactive measures not only serve to alleviate patient symptomatology but also preempt the trajectory towards adverse clinical outcomes, thereby obviating the exigency for subsequent surgical interventions engendered by deferred intervention. Thus, guided by the overarching research inquiry, "What is the incidence of postpartum urinary incontinence during exertion at 4-12 weeks postpartum and which determinants influence this condition?" our investigative agenda embarks upon the delineation of the "Incidence of postpartum stress urinary incontinence during exertion and associated determinants in the postpartum cohort," with delineated objectives:

1. Quantify the prevalence of postpartum stress urinary incontinence during exertion at 4-12 weeks postpartum within the precincts of Hung Vuong Hospital.

2. Scrutinize determinants pertinent to stress urinary incontinence in postpartum.

2. METHODS - STUDY POPULATION

Study Design: Cross-sectional Study.

Method to confirm the diagnosis of SUI: Based on the ICIQ-UI-SF questionaire combined with a clinical examination and perform a number of test (Valsava test, cough test or Boney test) to determine the presence of SUI at the time of examination.

Population: The study enrolled women who had given birth at Hung Vuong Hospital and subsequently attended postpartum check-ups at the hospital's clinic in Ho Chi Minh City between January 2021 and June 2021. Participants were selected based on predetermined criteria and provided informed consent to participate in the study.

Inclusion Criteria: Women who had delivered at Hung Vuong Hospital and presented for postpartum gynecological examination within 4 to 12 weeks post-delivery were included. Participants provided informed consent.

Exclusion Criteria: Participants with genital deformities, urinary tract cancers, urinary tract tumors causing bladder overflow obstruction, changes in bladder neck position causing overflow obstruction, bladder invasion causing urge incontinence, history of spinal cord injury, central nervous system disorders affecting urinary control leading to overflow incontinence, previous pelvic radiation therapy affecting bladder innervation, bladder sclerosis, urethra, pelvic support structures leading to overflow, exertional, or urge incontinence, psychiatric disorders leading to overflow incontinence, urgency incontinence, symptoms of urinary tract infection, acute vaginal or vulvar inflammation were excluded.

Sample Size Determination:

The sample size was calculated using the formula:

$$n = \frac{Z^2_{(1-\alpha/2)} \times p(1-p)}{d^2}$$

$Z^2_{(1-\alpha/2)}$: represents the critical value for the desired confidence level, Zα= 1,96 with α = 0,05

The proportion p was estimated based on previous research findings, and the desired margin of error d was set at 0.05

According to a previous study by Nguyen Thi Dieu Hien et al. (2014), the prevalence of postpartum urinary incontinence was 21.84% [2], resulting in a minimum required sample size of 263.

Data Collection Tools: Data collection included the use of structured forms, questionnaires encompassing background variables, the International Consultation on Incontinence Questionnaire-Short Form (ICIQ-UI-SF), and medical records.

3. PROCEDURES

1. Subject Selection: Postpartum patients were identified and interviewed during the study period, specifically targeting women returning for postpartum examination 4 weeks post-delivery.

2. Invitation to Participate: Eligible participants were invited to take part in the study. Upon agreement, participants underwent postpartum gynecological examination and a brief interview session.

3. Interview and Information Collection: All participants completed a questionnaire covering demographic information, medical history, obstetric history, and specific questions related to urinary incontinence symptoms.

4. Further Evaluation: Participants exhibiting signs of postpartum urinary incontinence during examination and interview were referred for additional evaluation of pelvic floor function.

5. Follow-up Examination: Participants were scheduled for a follow-up examination 12 weeks post-delivery, with priority given to study participants. The occurrence of postpartum exertional urinary incontinence was assessed at this time point.

6. Medical Record Review: Participants' medical records were reviewed to gather additional information on relevant variables such as labor duration and perineal tear severity.

Data Analysis: Data were entered and analyzed using the Statistical Package for the Social Sciences (SPSS) software.

Ethical Considerations: This study was approved by the Ethics Committee in Biomedical Research of Hung Vuong Hospital (Approval No. 127/ECBM-HVH) on January 13, 2021. Participants provided informed consent prior to their involvement in the study.

4. RESULTS

Table 1. Epidemiological characteristics of study subjects

Tổng		Frequency (n) (N = 283)	Rate (%)
Age	Average	29.55 + - 5.38	
	< 25	46	16.3
	25 - 29	104	36.7
	30 - 34	82	29.0
	≥ 35	51	18.0
Ethnicity	Others	11	3.9
	Kinh	272	96.1
Education level	Primary school or below	14	4.9
	Secondary school	54	19.1
	High school	93	32.9
	College, intermediate school	55	19.4
	University	67	23.7

Tổng		Frequency (n) (N = 283)	Rate (%)
Profession	Housemaking profession Business Office worker Worker Other	63 37 115 43 25	22.3 13.1 40.6 15.2 8.8
Residence	Ho Chi Minh City Others	188 95	66.4 33.6
Religion	Buddhism Catholic Others No	61 35 5 182	21.6 12.4 1.8 64.3

The average age of the study population was 29.55 ± 5.38 years old, nearly 50% had a second child or more. Most people live in Ho Chi Minh City. Office workers account for 40.6%. The majority of people are from intermediate school, college, university or higher with 43.1%. The Kinh ethnic group accounts for 96.1%.

Table 2. Characteristics of labor

Characteristics		Frequency (N = 283)	Rate (%)
Gestational age	< 37 weeks ≥ 37 weeks	26 257	9.2 90.8
Birth method	Vaginal delivery Assisted vaginal delivery Cesarean	137 13 133	48.4 4.6 47
Birth weight	 < 3500 grams ≥ 3500 grams	3146 ± 471 225 58	 79.5 20.5
Duration of labor (hour)	Vagianl delivery	N = 150 7.74 ± 5.79	
Duration of the second stage of labor (minute)	 < 30 minutes 30 - 60 minutes ≥ 60 minutes	N = 150 27.74 ± 30.35 105 27 18	 70 18 12
Episiotomy	Yes No	N = 150 101 49	 67.3 32.7
Degrees of perineal tears	 First-degree Second-degree Third-degree or higher	N = 150 17 32 100 1	 11.3 21.3 66.7 0.7

Characteristics		Frequency (N = 283)	Rate (%)
Labor pain relief		N = 150	
	Yes	69	46
	No	81	54
Perineal suture infection		N = 150	
	Yes	17	10.3
	No	133	89.7
Blood loss		N = 150	
Vaginal delivery	< 500 mL	143	95.3
	≥ 500 mL	7	4.7
		N = 133	
Cesarean	< 500 mL	119	89.5
	≥ 500 mL	14	10.5

The majority of births occur at 37 weeks gestational age or more, accounting for 90.8% of cases. The average birth weight for this cohort is 3146 ± 471g. Vaginal deliveries constitute 53% of all births, assisted vaginal deliveries account for 4.6%, and Cesarean makes up 47% of deliveries. In terms of perineal trauma, second-degree lacerations are predominant, comprising 66.7% of cases, followed by first-degree lacerations at 21.3%. The mean duration of labor is 7.74 ± 5.79 hours, with the second stage averaging 27.74 ± 30.35 minutes. Among women delivering vaginally, there are 7 cases of postpartum hemorrhage, representing 4.7% of the cohort.

Table 3. Prevalence of Postpartum of SUI and UI

Characteristics	Frequency (N = 283)	Prevalence (%)	95% CI
Postpartum UI through Questionair-Short Form	36	12.7	9.2 - 16.3
Postpartum SUI through Questionair with examination	45	15.9	12.0 - 20.1

Of the 283 subjects participating in the study, there were 36 cases of women with postpartum UI symptoms detected through a survey using the ICIQ UI SF questionnaire (International Consultation on Incontinence Questionair-Short Form), accounting for 12.7%, with a 95% confidence interval (95% CI) of: 9.2 - 16.3.

The overall prevalence of postpartum SUI through Questionair-Short Form combining with examination is 15.9%, with a 95% confidence interval (95% CI) of: 12.0 -20.1.

Table 4. Multivariate multiple regression analysis of factors related to postpartum urinary incontinence

	OR crude	P	OR adjusted 95% CI	P
Age				
< 35 years old	Ref		Ref	
≥ 35 years old	2,453	0,015	1,490 (0,551 - 4,034)	0,432
Number of vaginal deliveries				
≤ 2 times	Ref		Ref	
> 2 times	6,848	**0,001**	3,769 (1,182 - 12,017)	**0,025**

	OR crude	P	OR adjusted 95% CI	P
Number of Cesarean				
≤ 2 times	Ref		Ref	
> 2 times	0,059	**0,015**	0,038 (0,002 - 0,587)	**0,019**
Birth method this time				
Cesarean	Ref		Ref	
Vaginal delivery	4,351	**0,001**	5,186 (1,905 - 14,114)	**0,001**
Weight of the largest child				
< 3500 g	Ref		Ref	
3500 g	2,120	0,025	1,450 (0,625 - 3,365)	0,387
Urinary incontinence before pregnancy				
No	Ref		Ref	
Yes	7,169	0,002	3,409 (0,696 - 16,689)	0,130
Urinary incontinence during pregnancy				
No	Ref		Ref	
Yes	3,390	**0,001**	3,370 (1,555 - 7,306)	**0,002**
Chronic cough				
No	Ref		Ref	
Yes	4,546	0,029	3,864 (0,675 - 22,121)	0,129
Diabetes mellitus				
No	Ref		Ref	
Yes	1,926	0,06	2,145 (0,914 - 5,034)	0,08
Constipation				
No	Ref		Ref	
Yes	1,547	0,198	1,646 (0,771 - 3,512)	0,198

4. DISCUSSION

The prevalence of postpartum UI among women, as reported in various studies, varies considerably, ranging from 3.25% to 38.2%. Tanawattanacharoen and colleagues conducted a telephone-based survey of 413 women at 3 months postpartum, revealing a 7.8% rate of postpartum urinary incontinence, all of which occurred during exertion[13]. Similarly, Abdullah and colleagues conducted telephone interviews with women 6-8 weeks postpartum, finding the mean prevalence of UI to be 5.2%, with a rate of UI during exertion at 3.25% [4]. However, it is important to acknowledge that conducting surveys via telephone may introduce biases, as participants may opt not to disclose symptoms to hasten the survey completion process. Nevertheless, the UI rate documented by Moossdorff-Steinhauser in 2020 evalated as 33.3% [12]. Moossdorff-Steinhauser distributed the questionnaire along with articles on physical therapy exercises via associations of midwives on social media platforms. This strategy likely led to a higher rate of UI reporting, as those engaging with the survey were probably were concerned about or experiencing UI symptoms. Consequently, those less engaged or unaware of these issues through social networks might be more prone to report normal urinary function. This highlights how differences in data collection methods can result in divergent outcomes.

The International Consensus on Urinary Incontinence Short Form questionnaire, which is

at level of? Reccomendation is straightforward tool for identifying clinical urinary incontinence (UI) symptoms. In our study, we assessed UI on exertion during postpartum through interviews utilizing the ICIQ IU SF questionnaire, supplemented by clinical examinations. Our findings revealed a postpartum UI rate during exertion of 15.9%, a figure simila to the 15.5% rate reported by author Dieu Hien in a survey of postpartum women at Tu Du Hospital (2014) and the overall UI prevalence was 21.8% [2].

Wenes et al. (2012) aggregated data from various studies, revealing that the average prevalence of postpartum urinary incontinence (UI) ranged from 15% to 31% among primiparous women and from 18% to 38% among multiparous women [2],[15].

In 2014, a study was carried on by Nguyen Thi Dieu Hien examined the incidence of postpartum UI at Tu Du Hospital in Vietnam. Our findings closely mirrored those of Dieu Hien's research. Dieu Hien utilized the 3IQ questionnaire, which exhibited a sensitivity of 0.86 and a specificity of 0.6 in comparision to urodynamic diagnosis [5]. The questionnaire demonstrated good reliability, with a kappa index ranging of 0.65 - 0.69. Our questionnaire's reliability showed an improvement, achieving a kappa index of 0.71 when excluding the evaluation of quality of life scores. To enhance diagnostic specificity, we integrated clinical and physical examinations during appointments to more accurately detect the presence of stress UI. This method aimed to avoid overlooking cases at risk of SUI, especially those with weakened pelvic floor muscles, even if they lacked functional symptoms or observable urine leakage. These were identified as issues warranting vigilant monitoring.

The research investigated the correlation between the frequency of vaginal deliveries and postpartum SUI. The findings revealed a gradual increase in the prevalence of postpartum stress UI with each successive vaginal delivery. Among women who had never undergone vaginal delivery, those with one delivery, those with two deliveries, and those with three or more deliveries, the rates of postpartum SUI were as follows 6,2%, 12,9%, 26,4%, 50%, and the PR is 2,08, 4,26, 8,07, with $\chi 2=33,835$, $p<0,001$, this indicates that as the frequency of vaginal deliveries rises, women are at a greater risk of experiencing postpartum stress urinary incontinence.

According to the findings of our study, there is a significant association between the number of pregnancies and the incidence of postpartum stress urinary incontinence. Specifically, women with three or more vaginal deliveries exhibit a 4.52 times higher likelihood of developing postpartum SUI compared to primiparous women ($\chi 2=23.023$, $p=0.001$). Moreover, when stratifying by mode of delivery, multiparous women who have undergone three or more vaginal deliveries demonstrate an even greater risk, with an 8.07 times increase in the odds of experiencing postpartum stress UI compared to nulliparous women.

Regarding the association between cesarean section (CS) and postpartum SUI, the prevalence of postpartum stress UI was 24.7% in those who had not undergone CS. Conversely, the prevalence rates of postpartum SUI among women with one CS, two CSs, and three or more CSs were 3.1%, 14.6%, and 75%, respectively. In comparison to women never have CS, those with one or two CSs exhibited lower risks of postpartum SUI, with prevalence ratios (PRs) of 0.13 and 0.33, respectively ($\chi 2=32.217$, $p=0.001$). However, this protective effect shifted to a risk factor for postpartum stress UI in subsequent pregnancies, with a PR of 3.04. Cerruto et al. conducted a systematic meta-analysis of literature published on PubMed from 2000 to 2010, exploring factors influencing UI in postpartum European women. Their findings indicated that CS was associated with a decreased risk of postpartum UI compared to vaginal delivery; nevertheless, this protective effect diminished over time and with subsequent pregnancies (odds ratio [OR] 0.47, 95% confidence interval [CI] 0.04-5.69) [6].

In the subset of women experiencing urinary incontinence (UI) during pregnancy, the prevalence of postpartum SUI was observed to be 28.6%, contrasting with a prevalence

of 10.6% in the cohort without antenatal UI symptoms. This statistically significant difference underscores the heightened susceptibility to postpartum stress UI among pregnant women presenting with UI symptoms during pregnancy, with a prevalence ratio of 2.7, which means pregnant individuals presenting with symptoms of urinary incontinence during gestation demonstrate a 2.7 times higher likelihood of experiencing postpartum stress urinary incontinence compared to their asymptomatic counterparts ($p=0.001$, $\chi2=14.341$). Moreover, in a comprehensive study by Dieu Hien et al. (2014), employing multivariate analysis techniques, antenatal UI emerged as the singular predictor of postpartum UI, exhibiting an adjusted PR of 4.96 (95% CI 2.95-8.34, $p < 0.005$) [2]. Additionally, Leroy et al. (2016) corroborated these findings, revealing a significantly elevated prevalence of postpartum UI among women with antenatal UI symptoms, with an odds ratio (OR) of 12.82 (95% CI: 6.94-23.81) [9].

We proceeded with univariate analysis of all variables encompassed in the study, selecting those with a significance level of $p<0.2$ for inclusion in the multivariable logistic regression analysis. Following this analysis, we identified four factors significantly correlated with postpartum stress urinary incontinence.

Study Limitations:

Due to its cross-sectional design, our study lacks the capacity to infer the relationships between risk factors and symptoms of postpartum SUI with certainty.

5. CONCLUSION

The prevalence of postpartum SUI and UI among women 4-12 weeks postpartum was 15.9%, 12.7% in our research. Injuries to the pelvic floor that disrupt urinary control during pregnancy and postpartum need to be detected early. In addition, noninvasive interventional studies for this condition are needed.

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