

Prevalence of Urinary Incontinence during the Late Third Trimester and Three Months Postpartum Period in King Chulalongkorn Memorial Hospital

Somchai Tanawattanacharoen MD*,
Sawitree Thongtawee MD*

* Department of Obstetrics and Gynecology, Faculty of Medicine, Chulalongkorn University, Bangkok, Thailand

Objective: To assess prevalence of Urinary Incontinence (UI) during the late third trimester and three months postpartum period in King Chulalongkorn Memorial Hospital.

Material and Method: The present study population comprised ≥ 36 weeks singleton pregnant women attending the ANC at King Chulalongkorn Memorial Hospital between 2009 and 2010. Questionnaire was developed from International Continence Society Questionnaire, which consisted of two parts, (1) socioeconomic demographic, characteristics related to UI, and (2) obstetric characteristic, UI experienced after delivery. Validity and reliability of the questionnaire were tested (Cronbach's $\alpha = 0.8$). Chi-square, t-test, Pearson correlation McNemar test, and Binary logistic regression were used for comparison.

Results: The majority of the participants (93.8%) were aged between 20 and 39 years old. The prevalence of UI during late pregnancy and three months postpartum were 53.8% and 7.8%, respectively. This difference reached statistical significance ($p < 0.001$). There were 53.5% of stress UI, 20% of urge incontinence, and 7.8% of mixed type UI during late third trimester, whereas only stress UI was found in three months postpartum period. The only risk factor for late antenatal and early postpartum UI was high pre-pregnancy BMI (OR 2.3; 95% CI 1.38-3.85, $p < 0.001$ and OR 3.3; 95% CI 1.8-6.0, $p < 0.001$, respectively).

Conclusion: The prevalence of UI was quite high during the late third trimester (53.8%) and decreased significantly three months postpartum (7.8%). Pre-pregnancy BMI is the only risk factor for developing UI in late antenatal and early postpartum period. This may help obstetricians for prediction and prevention of UI during pregnancy and postpartum in high-risk group.

Keywords: Prevalence, Urinary Incontinence, Third trimester, Postpartum, Risk factor

J Med Assoc Thai 2013; 96 (2): 144-9

Full text. e-Journal: <http://jmat.mat.or.th>

Urinary incontinence (UI) is a common condition in women and is described by the International Continence Society (ICS) in 2002 as 'the involuntary passage of urine for any reason'⁽¹⁾. There are many types of UI, such as stress UI, urge incontinence, and mixed type UI. The prevalence of UI has previously been documented to be high both during and after pregnancy and child bearing⁽²⁾. The incidence and prevalence of UI vary widely. There are many established risk factors for UI, two of which are age and pregnancy.

UI during pregnancy is believed to be due to enlarging of the uterus and consequent pressure to the

bladder, increase in hormone levels and glomerular filtration rate, and change in vesicourethral angle^(3,4). The prevalence of postpartum UI has been reported as high as 30 to 50%^(5,6). However, UI generally improves within three months after delivery although this period can be longer in some women, and delivery itself is postulated to be an important factor for this extended duration. In the past, vaginal delivery was thought to be an important risk factor for UI due to pudendal nerve injury. However, most recent studies have demonstrated that cesarean section did not decrease the risk of UI compared to vaginal delivery⁽⁷⁻⁹⁾.

UI is an important health problem with psychological, social, hygienic problem, and effect impacts on the quality of life. Early diagnosis and effectively securing of the condition will contribute to improve female health. The purpose of the present study was to determine the prevalence of UI during

Correspondence to:

Tanawattanacharoen S, Department of Obstetrics and Gynecology, Faculty of Medicine, Chulalongkorn University, Rama IV Road, Patumwan, Bangkok 10330, Thailand.
Phone: 0-2256-4824, Fax: 0-2256-4825
E-mail: jmedstn@gmail.com

the third trimester and three months postpartum. The authors also aimed to establish the possible risk factors for UI in pregnant women.

Material and Method

This prospective descriptive study was conducted at King Chulalongkorn Memorial Hospital between July 2009 and February 2010. The present study was approved by the Institutional Review Board. Sample size estimation was calculated using the prevalence of 0.58 from pilot study ($\alpha = 1.96$, β -error = 0.05), 413 pregnant women were needed. Pregnant women attending the antenatal care (ANC) clinic who planned to deliver at King Chulalongkorn Memorial Hospital were recruited into the present study. The exclusion criteria were multiple pregnancy, history of UI before pregnancy, history of urethra or bladder surgery, lower urinary tract disorders and infection during pregnancy, medical diseases such as diabetes mellitus and hypertension with diuretic treatment, and incomplete medical record.

From the objectives, questionnaire was modified from ICIQ Incontinence Questionnaire⁽¹⁰⁾ and consisted of two parts, (1) socioeconomic-demographic, characteristics related to UI and (2) obstetric characteristic, UI experienced after delivery. Validity and reliability were tested (Cronbach's alpha = 0.80). The participants were explained about the questionnaire and benefits of the present study. They were ensured both anonymity and confidentiality. Informed consent was obtained from patients who agreed to participate. They were asked to complete the questionnaire at gestational age ≥ 36 weeks and again at three month postpartum (by phone).

Descriptive statistics were used for the subjects about socioeconomic-demographic characteristics and history of obstetric data. The Pearson correlation and McNemar test were used for correlation. Chi-square test and binary logistic regression were used for comparison. The significance level was considered at 95% confidence interval and $p < 0.05$. All statistical analyses were performed using SPSS version 16.0 (SPSS Inc., Chicago, IL, USA).

Results

Four hundred thirteen pregnant women were recruited into the present study and 383 of which responded to the telephone interviews 3 months postpartum. The majority of the participants (93.8%) aged between 20 and 39 years old. About one third of the participants (29.3%) finished more than lower

secondary school. The occupation were mainly company employees (26.4%), one-fifth had no occupation. Mean body weight was 52.7 ± 9.0 kg. Mean height was 155 ± 5.6 cm. Mean BMI was 21.7 ± 3.5 kg/m². Other demographic data were shown in Table 1.

UI was reported in 222 women (53.8%) during third trimester of pregnancy and 30 women (7.8%) at three months postpartum. The difference of UI between these two periods reached statistical significance ($p < 0.001$). Types of UI during each period were shown in Table 2. The characteristics of the pregnant who did and did not develop UI in the late third trimester and three months postpartum are demonstrated in Table 3.

Risk factor for antenatal UI was high pre-pregnancy BMI (OR 2.3, 95% CI 1.38-3.85, $p < 0.001$). Age and parity did not differ significantly among

Table 1. Characteristics of the participants

Variables	n (%)
Age ^a (year)	
<20	17 (4.1)
20-29	222 (53.8)
30-39	165 (40.0)
40-49	9 (2.2)
Educational Levels ^a	
≤ Lower secondary school	292 (70.7)
> Upper secondary school	121 (29.3)
Occupation ^a	
No	94 (22.8)
Agriculture	7 (1.7)
Commerce	50 (12.1)
Employee	108 (26.2)
Government officer	20 (4.8)
Company employee	109 (26.4)
Housewife	23 (5.6)
Other	2 (0.5)
Weight ^b (kg)	52.7±9.0 (31-98)
Height ^b (cm)	155.0±5.6 (140-175)
BMI ^b (kg/m ²)	21.7±3.5 (13.7-38.2)
Parity ^a	
Nulliparous	182 (44.1)
Multiparous	231 (55.9)
Income ^a (baht)	
No	14 (3.4)
<5,000	19 (4.6)
5,001-10,000	122 (29.5)
10,001-15,000	100 (24.2)
>20,000	74 (17.9)
Other	84 (20.4)

^a Presented as number (%)

^b Presented as mean±SD (range)

antenatal UI ($p = 0.86$ and 0.414 , respectively). Regarding three months postpartum UI, high pre-pregnancy BMI was also the only risk factor (OR 3.3, 95% CI 1.8-6.0, $p < 0.001$) as shown in Table 4.

Discussion

The present study showed that 53.8% of pregnant women complained of UI during the third

trimester of pregnancies, which corresponds to several previous reports (44.8-58%)^(2,11). Regarding the types of UI found in the third trimester of pregnancy, similar to the study of Wesnes et al⁽²⁾, stress UI was most prevalent (53.5%), followed by urge urinary incontinence (20%) and mixed type UI (19.8%). However, Lewicky-Gaupp et al⁽¹²⁾ have recently reported 44% of urge incontinence and 43% of stress UI in pregnant women. The reason stress UI is common during pregnancy is still controversial. The possible factors may be degenerative changes in the autonomic innervation of the lower urinary tract or mechanical pressure exerted by the enlarged uterus.

Only 7.8% of the present study population still experienced UI in three months postpartum period and all were stress UI. The prevalence was similar to, albeit the difference in types, the study of Lewicky-Gaupp et al⁽¹²⁾, which reported 9% of urge incontinence and 5% of stress UI six weeks after delivery. The result was different from the study of Ege et al⁽¹³⁾ and

Table 2. Prevalence of urinary incontinence

Urinary incontinence	n (%)
During pregnancy (n = 413)	222 (53.8)
Stress incontinence	221 (53.5)
Urge incontinence	83 (20.0)
Mixed incontinence	82 (19.8)
Three month postpartum (n = 383)	30 (7.8)
Stress incontinence	30 (7.8)
Urge incontinence	0 (0)
Mixed incontinence	0 (0)

Table 3. Characteristics of UI during late pregnancy and 3 months postpartum

Characteristics	During late pregnancy		3 months postpartum	
	UI (n)	No UI (n)	UI (n)	No UI (n)
Age (year)				
<20	19	11	3	20
20-29	105	107	14	182
30-39	87	69	12	137
≥40	11	4	1	13
Parity				
Nulliparous	89	73	8	144
Multiparous	133	118	22	209
Pre-pregnancy BMI (kg/m ²)	23.97±5.93	22.41±4.28	23.97±5.93	22.41±4.28
Route of delivery				
Vagina	-	-	21	221
Cesarean section	-	-	9	32
Baby birth weight (gram)				
<4,000	-	-	29	351
≥4,000	-	-	1	2

Table 4. Risk factors of UI during late pregnancy and 3 months postpartum

Period of UI	Risk factor	p-value	Adjust OR	95% CI
During pregnancy (n = 413)	Age	0.24	-	-
	Parity	0.66	-	-
	Pre-pregnancy BMI	0.001	2.3	1.38-3.85
3 month postpartum (n = 383)	Age	0.24	-	-
	Parity	0.30	-	-
	Pre-pregnancy BMI	0.001	3.3	1.80-6.00
	Route of delivery	0.42	-	-
	Baby birth weight	0.91	-	-

Dolan et al⁽¹⁴⁾, who reported 19.5% UI in the 12-month postpartum period and 13% of UI in the third month after delivery, respectively. Some other factors such as race, sociocultural background, and pre-pregnant voiding pattern may play a role in these differences.

In contrast with Peschers et al⁽¹⁵⁾ who established that there was no relationship between age, BMI, and UI, the authors found the relationship between UI during pregnancy and pre-pregnancy BMI. However, there was no relationship between UI during pregnancy and either age or parity. Logistic regression analysis indicated that women who had high pre-pregnancy BMI were at risk for UI.

The authors also found the association between UI in three months after delivery and pre-pregnancy BMI. No relationship was seen between UI in three months after delivery and age, parity, route of delivery, and birth weight. Regarding route of delivery, while the rate of cesarean delivery is steadily rising in both industrialized and developing countries, some studies have shown that planned cesarean delivery could prevent UI⁽¹⁶⁻¹⁹⁾. However, some stated the contrary^(7,20). Ege et al⁽¹³⁾ reported that women who had heavier babies at birth were at higher risk for developing UI, which seemed to be reasonable because it was likely to cause more birth canal injury. However, there might be too small a number of fetal macrosomia to draw any conclusion in the present study.

One limitation of the present study is that all data are based on self-report, which may contain recall bias. Another limitation is that the number of postpartum UI might be too small to draw the definite conclusion regarding risk factors for postpartum UI.

In summary, the results of the present study suggest that high pre-pregnancy BMI are a major risk factor for developing UI in early postpartum period. The presences of high BMI in ANC clinic may help obstetricians predict the higher rate of UI. These pregnant women may need advice for life style modification to reduce their risks such as limit their weight gain, avoid drinking too much water, avoid caffeine-contained drinks or food, consume high fiber diet, and exercise. These may help to preventing UI during pregnancy and after delivery, which will improve their quality of life in the future.

Acknowledgement

The authors wish to thank the Department of Obstetrics and Gynecology, Faculty of Medicine, Chulalongkorn University, Professor Sompop Limpongsanurak, resident members and nursing staffs

of ANC clinic for introducing and taking care of participants.

Potential conflicts of interest

None.

References

1. Abrams P, Cardozo L, Fall M, Griffiths D, Rosier P, Ulmsten U, et al. The standardisation of terminology of lower urinary tract function: report from the Standardisation Sub-committee of the International Continence Society. *Neurourol Urodyn* 2002; 21: 167-78.
2. Wesnes SL, Rortveit G, Bo K, Hunskaar S. Urinary incontinence during pregnancy. *Obstet Gynecol* 2007; 109: 922-8.
3. Viktrup L, Lose G, Rolff M, Barfoed K. The symptom of stress incontinence caused by pregnancy or delivery in primiparas. *Obstet Gynecol* 1992; 79: 945-9.
4. Chaliha C, Kalia V, Stanton SL, Monga A, Sultan AH. Antenatal prediction of postpartum urinary and fecal incontinence. *Obstet Gynecol* 1999; 94: 689-94.
5. Wilson PD, Herbison RM, Herbison GP. Obstetric practice and the prevalence of urinary incontinence three months after delivery. *Br J Obstet Gynaecol* 1996; 103: 154-61.
6. Marshall K, Thompson KA, Walsh DM, Baxter GD. Incidence of urinary incontinence and constipation during pregnancy and postpartum: survey of current findings at the Rotunda Lying-In Hospital. *Br J Obstet Gynaecol* 1998; 105: 400-2.
7. Rortveit G, Daltveit AK, Hannestad YS, Hunskaar S. Vaginal delivery parameters and urinary incontinence: the Norwegian EPINCONT study. *Am J Obstet Gynecol* 2003; 189: 1268-74.
8. MacLennan AH, Taylor AW, Wilson DH, Wilson D. The prevalence of pelvic floor disorders and their relationship to gender, age, parity and mode of delivery. *BJOG* 2000; 107: 1460-70.
9. McKinnie V, Swift SE, Wang W, Woodman P, O'Boyle A, Kahn M, et al. The effect of pregnancy and mode of delivery on the prevalence of urinary and fecal incontinence. *Am J Obstet Gynecol* 2005; 193: 512-7.
10. ICIQ Incontinence Questionnaire. Windsor urology [Internet]. 2011 [cited 2009 Oct 1]. Available from: http://www.windsorurology.co.uk/downloads/ICIQ_Form.pdf
11. Al Mehaisen LM, Al Kuran O, Lataifeh IM,

- Betawie S, Sindiyani A, Al ttal OF, et al. Prevalence and frequency of severity of urinary incontinence symptoms in late pregnancy: a prospective study in the north of Jordan. *Arch Gynecol Obstet* 2009; 279: 499-503.
12. Lewicky-Gaupp C, Cao DC, Culbertson S. Urinary and anal incontinence in African American teenaged gravidas during pregnancy and the puerperium. *J Pediatr Adolesc Gynecol* 2008; 21: 21-6.
 13. Ege E, Akin B, Altuntug K, Benli S, Arioz A. Prevalence of urinary incontinence in the 12-month postpartum period and related risk factors in Turkey. *Urol Int* 2008; 80: 355-61.
 14. Dolan LM, Walsh D, Hamilton S, Marshall K, Thompson K, Ashe RG. A study of quality of life in primigravidae with urinary incontinence. *Int Urogynecol J Pelvic Floor Dysfunct* 2004; 15: 160-4.
 15. Peschers UM, Sultan AH, Jundt K, Mayer A, Drinovac V, Dimpfl T. Urinary and anal incontinence after vacuum delivery. *Eur J Obstet Gynecol Reprod Biol* 2003; 110: 39-42.
 16. Farrell SA, Allen VM, Baskett TF. Parturition and urinary incontinence in primiparas. *Obstet Gynecol* 2001; 97: 350-6.
 17. Groutz A, Rimon E, Peled S, Gold R, Pauzner D, Lessing JB, et al. Cesarean section: does it really prevent the development of postpartum stress urinary incontinence? A prospective study of 363 women one year after their first delivery. *Neurourol Urodyn* 2004; 23: 2-6.
 18. Hvidman L, Foldspang A, Mommsen S, Nielsen JB. Postpartum urinary incontinence. *Acta Obstet Gynecol Scand* 2003; 82: 556-63.
 19. Foldspang A, Hvidman L, Mommsen S, Nielsen JB. Risk of postpartum urinary incontinence associated with pregnancy and mode of delivery. *Acta Obstet Gynecol Scand* 2004; 83: 923-7.
 20. Lal M. Prevention of urinary and anal incontinence: role of elective cesarean delivery. *Curr Opin Obstet Gynecol* 2003; 15: 439-48.

ความชุกของการเกิดภาวะปัสสาวะเล็ดในหญิงตั้งครรภ์ตั้งแต่อายุครรภ์ 36 สัปดาห์ และภายหลังคลอด 3 เดือน
ในโรงพยาบาลจุฬาลงกรณ์

สมชาย ธนวัฒนาเจริญ, สาวิตรี ทองทวี

วัตถุประสงค์: เพื่อศึกษาความชุกของการเกิดภาวะปัสสาวะเล็ด (urinary incontinence; UI) ในหญิงตั้งครรภ์ช่วงปลายไตรมาสที่สาม และภายหลังคลอด 3 เดือนในโรงพยาบาลจุฬาลงกรณ์

วัสดุและวิธีการ: ศึกษาในหญิงตั้งครรภ์เดี่ยวที่มาฝากครรภ์ที่โรงพยาบาลจุฬาลงกรณ์ ขณะอายุครรภ์ 36 สัปดาห์ขึ้นไป และต้องการคลอดที่โรงพยาบาลจุฬาลงกรณ์ ระหว่างปี พ.ศ. 2552-2553 โดยใช้แบบสอบถามที่พัฒนาจากแบบสอบถามของ International Continence Society ซึ่งประกอบด้วยคำถาม 2 ส่วน; (1) ข้อมูลทั่วไปของมารดา รวมถึงปัจจัยเสี่ยงต่างๆ ต่อการเกิดภาวะปัสสาวะเล็ด และ (2) ข้อมูลทางสูติศาสตร์ และการเกิดภาวะปัสสาวะเล็ด แบบสอบถามได้รับการทดสอบก่อนนำมาใช้โดยมี Cronbach's alpha = 0.8 หลังจากนั้นนำข้อมูลที่ได้มาวิเคราะห์ทางสถิติโดยใช้ Chi-square test และ t-test ใช้ Pearson correlation McNemar test และ binary logistic regression ในการวิเคราะห์เปรียบเทียบ

ผลการศึกษา: หญิงตั้งครรภ์ส่วนใหญ่ (ร้อยละ 93.8) อยู่ในกลุ่มอายุ 20-39 ปี ความชุกของการเกิดภาวะปัสสาวะเล็ดในกลุ่มหญิงตั้งครรภ์ช่วงปลายไตรมาสที่สาม และ 3 เดือนหลังคลอด เท่ากับร้อยละ 53.8 และ 7.8 ตามลำดับ ซึ่งแตกต่างกันอย่างมีนัยสำคัญทางสถิติ ภาวะปัสสาวะเล็ดในกลุ่มหญิงตั้งครรภ์ช่วงปลายไตรมาสที่สามเป็นชนิด stress UI ร้อยละ 53.5 ชนิด urgency ร้อยละ 20 และชนิด mixed UI ร้อยละ 19.8 และความชุกของการเกิดภาวะปัสสาวะเล็ดภายหลัง 3 เดือนหลัง พบภาวะ stress UI ชนิดเดียว และพบว่าภาวะน้ำหนักตัวก่อนการตั้งครรภ์เป็นปัจจัยเสี่ยงที่ทำให้เกิดภาวะปัสสาวะเล็ดขณะตั้งครรภ์อย่างมีนัยสำคัญทางสถิติ (OR 2.3, 95% CI 1.38-3.85, $p < 0.001$) ในขณะที่ปัจจัยเสี่ยงที่ทำให้เกิดภาวะปัสสาวะเล็ดภายหลังคลอด 3 เดือน ได้แก่ น้ำหนักตัวก่อนการตั้งครรภ์ (OR 3.3, 95% CI 1.8-6.0, $p < 0.001$) และจำนวนการตั้งครรภ์ (OR 2.6, 95% CI 1.09-6.50, $p < 0.031$)

สรุป: ความชุกของการเกิดภาวะปัสสาวะเล็ดในกลุ่มหญิงตั้งครรภ์ช่วงปลายไตรมาสที่สามค่อนข้างสูง (ร้อยละ 53.8) และลดลงในช่วง 3 เดือนหลังคลอด (ร้อยละ 7.8) น้ำหนักตัวก่อนการตั้งครรภ์เป็นปัจจัยเสี่ยงเดียวที่ทำให้เกิดภาวะปัสสาวะเล็ดในระยะตั้งครรภ์ช่วงหลังและภายหลังการคลอด 3 เดือน ข้อมูลนี้อาจช่วยให้สูติแพทย์สามารถพยากรณ์และป้องกันการเกิดภาวะปัสสาวะเล็ดในหญิงตั้งครรภ์กลุ่มเสี่ยงได้
