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Original Article

Persistent stress urinary incontinence during pregnancy and one year after delivery; its prevalence, risk factors and impact on quality of life in Taiwanese women: An observational cohort study



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ABSTRACT

Objective: The study was to investigate the prevalence and risk factors of stress urinary incontinence (SUI) and its impact on the quality of life during pregnancy and 12 months after delivery.

Materials and methods: 866 women delivering their newborns at a tertiary hospital were recruited. All women were asked to complete several questionnaires including demographic and obstetric data, Short Form 12 health survey (SF-12), Urogenital Distress Inventory Short Form (UDI-6), and Incontinence Impact Questionnaire Short Form (IIQ-7). All women were interviewed via telephone to answer the same questionnaires at 12 months postpartum.

Results: There were 446 (51.5%) self-reported SUI women during pregnancy. Out of 560 women delivered vaginally, 70 (12.5%) had SUI at 12 months postpartum; in 306 women undergoing Cesarean delivery, 22 (7.2%) experienced SUI 12 months after delivery. Risk factors of SUI during pregnancy included body weight and body mass index at first visit. At 12 months postpartum, parity stood out as the risk factor of persistent SUI in vaginal delivery group, but no significant risk factor was found in Cesarean group. Women with SUI during pregnancy featured worse mental component summary (MCS) score of SF-12, compared to women without SUI. At 12 months postpartum, women with persistent SUI in vaginal delivery group had higher mean UDI-6 and IIQ-7 scores than those without SUI.

Conclusion: Persistent SUI is more prevalent in the vaginal delivery group than Cesarean group. Both SUI during pregnancy and after childbirth have negative impact on the quality of life in women undergoing vaginal delivery.

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Introduction

Pregnancy and birth trauma are thought to be associated with the development of stress urinary incontinence (SUI) [1–6]. The prevalence of SUI during pregnancy and after delivery is high but varies depending on the definitions applied, recruited population, and study design. Epidemiological studies showed the prevalence of SUI during pregnancy increasing with gestational age and ranging from 18.6% to 67% [7–10]. While the reported prevalence of SUI in women after delivery is 7–56% [5,11,12], and declines rapidly within 6

months [13,14], until now, there is no consensus with regard to the contributing factors of SUI during pregnancy and after delivery. Previous studies showed that SUI during pregnancy, parity and mode of delivery are commonly reported determinants of postpartum SUI [6,14–20]. However, most studies have focused on the effect of vaginal delivery and mainly studied lower urinary tract symptoms (LUTS) during the third trimester of pregnancy and at 3 months after delivery [6,15,17,20]. But nevertheless Cesarean section has also been reported associated with postpartum SUI when compared with nulliparous status [20,21]. SUI can disturb life quality of women, but only a few studies have been conducted to evaluate the impact of SUI on the health-related quality of life of women after childbirth [15,19,22,23]. The purposes of this study were to investigate the prevalence and risk factors of SUI, and its impact on the quality of life during pregnancy and 12 months after delivery.

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Methods

Between February 2014 and May 2015, 866 women delivering their newborns after 28 gestation weeks at a tertiary hospital were recruited. Exclusion criteria included multiple gestations, deliveries before 28 gestational weeks, severe cardio-pulmonary or renal diseases, preeclampsia, insulin-dependent diabetes mellitus, neurogenic diseases, and presence of urinary incontinence before pregnancy. All women gave informed consent for participation. The Ethics Committee of the institute has approved this study protocol (No. 102–0605B).

On the postpartum day 2 or 3, all women were questioned by a single research nurse through face to face interview in the obstetric wards if they had experienced SUI or other LUTS during pregnancy, using a structured urogynecological questionnaire regarding LUTS [24], in which LUTS was defined according to the recommendations of the International Continence Society [25]. In addition to the questions on the questionnaire, we asked the patients: “Do you experience urinary leakage in your daily life?” to assess the presence of SUI. SUI was considered present if participants lost urine on coughing, sneezing, or physical exertion during pregnancy and after childbirth. The focus stayed on the symptoms of SUI in this study.

The Short Form 12 health survey (SF-12) assessed generic health-related quality of life [26]. Additionally, Incontinence Impact Questionnaire Short Form (IIQ-7) and Urogenital Distress Inventory Short Form (UDI-6) were used to evaluate the life impacts associated with SUI in all recruited women [27]. The SF-12 has 2 summary scores, physical component summary (PCS) and mental component summary (MCS) scores, which assess physical and mental function, respectively. Both of these summary scores have a range from 0 to 100, with higher scores indicating better quality of life. Scoring for the IIQ-7 and UDI-6 comprised a 4-point Likert scale: 0 for “not at all,” 1 for “slightly,” 2 for “moderately,” and 3 for “greatly.” The higher the score, the worse the symptoms related to SUI and the worse the perceived quality of life [27]. The UDI-6 indicated overall bladder symptom distress, combining information on irritating symptoms, stress symptoms, and obstructive/discomfort symptoms [27]. The IIQ-7 was divided into four domains: physical activity, travel, social activity and emotional health.

All medical records were also reviewed in detail for each subject, and the following data were systematically abstracted: maternal demographic and reproductive characteristics including maternal age, parity, maternal weight (pre-pregnancy and at delivery), body mass index (BMI) at pre-pregnancy and delivery, labor courses (duration of first and second stages of labor), complications during

pregnancy (pre-eclampsia/eclampsia and gestational diabetes, insulin dependent only), excluded instrument-assisted vaginal delivery, perineal laceration, newborn's birth weight and head circumference. Both of third-degree and fourth-degree lacerations were considered as severe perineal lacerations.

The computerized database was analyzed to compare various obstetric parameters and scores of SF-12, UDI-6 and IIQ-7 between women with and without SUI during pregnancy and after delivery. Continuous data were analyzed by the Student t test, and the relative proportions were compared using the Chi-square test. Data were analyzed using the SPSS version 20.0 for Windows (SPSS, Inc., Chicago, IL, USA). Probability values less than 0.05 were considered statistically significant.

Results

The characteristics of the participants are shown in Table 1. A total of 446 women, including 303 (54.1%) vaginal deliveries and 143 (46.7%) Cesarean deliveries had self-reported SUI during pregnancy. Out of 560 women delivered vaginally, 110 (19.6%) and 70 (12.5%) had SUI at 3 and 12 months postpartum, respectively, while in the 306 women undergoing Cesarean delivery, SUI occurred in 29 (9.5%) at 3 months and 22 (7.2%) at 12 months postpartum (Fig. 1).

Risk factors of SUI during pregnancy (Table 1) include body weight ($P = 0.031$) and BMI at first visit, around sixth to eighth weeks ($P = 0.024$). Risk factors of persistent SUI at 3 months after vaginal delivery (Table 2) included parity ($P = 0.025$), duration of first stage ($P = 0.045$) and duration of second stage of labor ($P = 0.012$), and instrument assisted vaginal delivery ($P = 0.042$); while the significant risk factor of persistent SUI at 3 months after Cesarean section (Table 3) was birth weight ($P = 0.033$). Parity ($P = 0.042$) was the only risk factor of persistent SUI at 12 months in vaginal delivery group (Table 4), but no significant risk factor was found in Cesarean group at 12 month after delivery (Table 5).

Women with SUI during pregnancy had worse MCS score of SF-12 ($P = 0.001$), when compared to women without SUI (Table 1). In vaginal delivery group, women with persistent SUI had higher mean UDI-6 (6.9 ± 2.4 vs 4.8 ± 3.5 , $P = 0.001$) and IIQ-7 scores than those without SUI (3.0 ± 3.5 vs 2.7 ± 3.5 , $P = 0.001$) at 3 months postpartum (Table 2). At 12 months after vaginal delivery (Table 4), women with persistent SUI showed worse UDI-6 (5.9 ± 2.4 vs 3.8 ± 3.5 , $P = 0.001$). In Cesarean delivery group, there were no significant differences in SF-12, UDI-6 and IIQ-7 scores between

Table 1
Characteristics of women with and without UI during pregnancy.

Variable	No UI (n = 420)	With UI (n = 446)	Total (n = 866)	P value
Age (y)	32.4 ± 4.3	32.8 ± 4.4	32.6 ± 4.3	0.304
Parity	1.6 ± 0.7	1.7 ± 0.7	1.7 ± 0.7	0.988
First visit BW (kg)	56.4 ± 9.7	57.9 ± 10.9	57.1 ± 10.4	0.031*
BW at delivery (kg)	68.3 ± 9.9	69.3 ± 11.0	68.8 ± 10.5	0.184
First visit BMI (kg/m ²)	22.0 ± 3.5	22.6 ± 4.0	22.3 ± 3.8	0.024*
BMI at delivery (kg/m ²)	26.7 ± 3.6	27.0 ± 4.1	26.9 ± 3.8	0.163
Gestational age (w)	38.2 ± 1.9	38.2 ± 1.8	38.2 ± 1.8	0.988
Complication during pregnancy	31 (7.4%)	48 (10.8%)	79 (9.1%)	0.103
Birth weight (g)	3058.2 ± 484.9	3066.7 ± 448.4	3062.6 ± 466.2	0.794
Newborn's HC (cm)	33.8 ± 2.2	33.7 ± 1.6	33.8 ± 1.9	0.513
PCS of SF-12	37.1 ± 8.2	36.7 ± 8.0	36.9 ± 8.1	0.566
MCS of SF-12	53.4 ± 9.5	51.2 ± 9.5	52.3 ± 9.5	0.001*
UDI-6 total scores	5.2 ± 3.5	5.6 ± 3.4	6.2 ± 2.4	0.243
IIQ-7 total scores	2.8 ± 3.5	2.9 ± 3.5	2.9 ± 3.5	0.478

Data are presented as mean ± standard deviation and n (%).

UI = urinary incontinence; BW = maternal body weight; BMI = body mass index; HC = head circumference; PCS = physical component summary; MCS = mental component summary; SF-12 = short form 12 health survey. *: $P < 0.05$, statistically significant.

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