



Urinary incontinence and risk attributing factors at gestation and postpartum among the females of North Gujarat

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ABSTRACT

Introduction: Urinary incontinence (UI) is a common and growing health problem that affects human population across the globe with female predominance. Its prevalence has previously been documented during pregnancy and after with reported interference with QoL. This prospective cohort study was conducted to investigate the incidence of UI during pregnancy and three months postpartum and determine the risk factors underlying UI.

Method: A total of 605 complete responses on ICIQ-UI SF questionnaire were obtained from pregnant women visiting the Nootan General Hospital (NGH) Visnagar, Gujarat, India using personal interview and by Google form.

Result: The prevalence of urinary incontinence at gestation was found to be 325 in 605 (54%) with majority (70%) reporting SUI and moderate severity (58%). During follow-up at postpartum between 3-6 months the UI was reported as 161 in 360 (45%), with 74% SUI type and moderate severity in 51%. Factors significantly associated with urinary incontinence at gestation included age group, gestational stage, parity, delivery type in previous pregnancy, BMI at conception, caffeine consumption and childhood enuresis. Using Cox multivariate hazard proportionality analysis, only a few remained significant with caffeine consumption (OR = 2.2, 95% CI 1.4–4.5), vaginal birth (OR = 1.6, 95% CI 0.9–4.7), BMI > 25 (OR = 3.8,

95% CI 1.9–6.8) and baby weight more than 2.5 kg (OR = 4.2, 95%CI 2.3–8.5) being the bad risk factors for UI.

Conclusion: Urinary incontinence was moderately prevalent in pregnant women of the current study and four factors were identified as bad risk to be associated with increasing the risk of developing urinary incontinence during pregnancy.

Keywords: Urinary incontinence, Pregnant, Postpartum, ICIQ-UI (SF)

INTRODUCTION

Urinary incontinence (UI), defined as ‘the involuntary leakage of urine due to sneezing, coughing or physical exertion’ by The International Continence Society (ICS), is a common health problem that affects millions of people globally with female predominance.^{1,2} Its prevalence increases proportionally with age.^{3,4} Besides, other contributing risk factors include Obesity, Gestation, child birth, Intensive workout, among others.⁵ However, UI that arises during pregnancy is often temporary and can resolve after delivery, but in some women, UI during pregnancy can persist after delivery and becomes chronic.⁶ During vaginal delivery the integrity of pelvic muscles are damaged, rendering the risk of dysfunctional pelvic floor.⁵

The long-term protective effect of caesarean delivery has not been determined. The muscle strength of the pelvic floor returns to the antepartum value 6–10 weeks postpartum in most women.⁷

The long-term associations of delivery mode with UI and changes in UI over a continuous period are unclear or remain controversial, perhaps as a result of different methodologies, including variations in the definition of UI, measuring instruments used, measuring time points, and research design such as whether within-subject comparisons were used.⁷

Aim: The aim of this prospective study is to investigate and compare UI in pregnant and postpartum females of Gujarat using ICIQ-UI (SF).

Objectives:

1. To observe the prevalence of UI among pregnant and postpartum women.
2. To access the frequency of types of UI in pregnant and postpartum women.
3. To access the degree of severity of UI in pregnant and postpartum women.
4. To identify the underlying risk factors of UI at gestation and at postpartum.

METHODOLOGY

After prior informed consent complete responses were obtained from a total of 605 pregnant women attaining at least 2nd trimester and later, using the ICIQ-UI Short Form. Responses were collected by direct interview with the participants adopting a non-randomized voluntary response sampling technique. The study was further made prospective by following up with

the consented participant's up to 3-6 months postpartum. Entire data was collected between September 2022 and May 2023 from the participants visiting the OPDs of the Gynaecology department, NGH, Visnagar, Gujarat, West India. The follow up data was collected by the participants who visited the Paediatrics department at the same hospital and/ or were conveniently approached by phone.

Inclusion Criteria

1. Age group 18-40 years female inhabiting Gujarat.
2. Gestational stage of 2nd and 3rd trimester.
3. Postpartum up to 6 months.

Exclusion Criteria

1. Females above 40 years age
2. Males
3. Females from outside the state of Gujarat
4. Presence of any other Systemic disease such as., Placenta previa, Pre-eclampsia, Gestational diabetes, STDs, Renal disease, Cancer, Epilepsy, Neurological disorders, among others.

Statistical Analysis

The criterion adopted to classify a pregnant woman as incontinent was based on the ICS definition corresponding to any person who had confirmed urinary leakage, regardless of the amount leaked.

Data collected from ICIQ-UI (SF) was analyzed for presence, type and severity of UI through Microsoft excel version 2010. Chi square test was used to find statistical significance. Multivariate regression model was used to identify the significantly contributing risk factors. Statistical significance was set at the 5% level ($p < 0.05$).

RESULT:

From a total of 605 pregnant respondents, 325 (54%) reported UI, with a median age of 29.6 years, mostly (65%) graduates by qualification and home makers (Table 1). Table 3 shows that the Stress Urinary Incontinence (SUI) type was reported in high frequency (70%) with moderate severity level (58%) and bother (55%). Of the incontinent women 62% were in 3rd trimester, as opposed to the continent cohort were majority (69%) were in the 2nd trimester (Table 1). 85% of continent women were primiparous with 61% undergone through vaginal mode of delivery in earlier pregnancy, as opposed to 39% primiparous in the continent cohort with 68% of caesarean delivery mode in previous pregnancy. 52% of incontinent primiparous women had baby birth weight $>3\text{kg}$, while among the continent primiparous females 45% had

given birth to babies weighing >3kg (Table 1). Notably, 11% of UI cohort had family history of the condition and almost one third suffered from childhood enuresis. Overall, 9% of the incontinent women had developed some UI before pregnancy while 35% of the incontinent primiparous women reportedly developed it from the last pregnancy. Incontinent cohort had more caffeine (58%) uptake than the continent (45%). BMI >25 was observed in 66% of women with UI and 53% of continent women (Table 1). The variables found significantly associated (p-value <0.05) with UI in pregnancy and at postpartum in the present study were viz., caffeine consumption, gestational stage, BMI at conception and after delivery, parity, delivery mode and baby birth weight (Table 1 and 2).

Follow-up was obtained from a total of 360 women at postpartum between 3-6 month. Most of them reportedly carried UI before or during pregnancy (n=265) but at postpartum 161 (45%) reported to have UI while 199 (55%) women reported to be urinary continent after child birth (Table 2). A few (n=28) acquired the condition after child birth (Table 2). Notably, these 28 women were nulliparous earlier and had no UI during pregnancy and before. Moreover, among 23 of them delivery mode was vaginal, with an average baby weight at birth as 2.7kg. BMI >25 at postpartum was observed in 165 (49%) women, of which 54% were incontinent. 60% of more caffeine consuming women reported UI at postpartum as well. Out of 360 follow-up cohort, 156 women had vaginal childbirth with 87 (56%) being UI.

The SUI type was commonly reported by 74% of Women at postpartum, with moderate severity (51%) and bother (57%).

Table 1. General and clinical characteristics of Urinary Incontinence (UI) vs Urinary Continenence (UC)

Variables	UI (n=325)	UC (n=280)	p-value
N	325 (54%)	280 (46%)	
AGE (median, SD)	29.6, 1.66	31.8, 1.14	
<= 35 years	236 (73%)	199 (71%)	0.45
> 35 years	89 (27%)	81 (29%)	
Education			
Upto Senior Secondary	116 (35%)	88 (31%)	0.29
UG or above	209 (65%)	192 (69%)	
Occupation			
Office Job	115 (35%)	84 (30%)	0.56
Home-maker	210 (65%)	196 (70%)	
UI before any pregnancy	29 (9%)	0 (0.0%)	
Family History of UI	36 (11%)	2 (0.7%)	
Childhood enuresis	108 (33%)	46 (16%)	

Constipation (<3 motions/week)	21 (6%)	39 (14%)	
Caffein consumption (tea/coffee)			
<=2 cups/day	139 (42%)	154 (55%)	0.002*
>2 cups/day	186 (58%)	126 (45%)	
BMI at current conception			
Underweight (<18.5)	06 (2%)	9 (3%)	
Normal (18.5-24.9)	102 (32%)	121 (37%)	0.001*
Overweight (25-29.9)	129 (39%)	150 (53%)	
Obese (>=30)	88 (27%)	0 (0.0%)	
Gestational stage			
2 nd trimester	123 (38%)	193 (69%)	0.001*
3 rd trimester	202 (62%)	87 (31%)	
Parity			
Nulliparous	49 (15%)	169 (61%)	0.001*
Primiparous	276 (85%)	111 (39%)	
Delivery type in previous pregnancy (n=primiparous)			
Vaginal	168 (61%)	34 (32%)	0.001*
Caesarean	108 (39%)	77 (68%)	
Baby weight from last pregnancy (n=primiparous)			
<=2.5kg	46 (17%)	33 (30%)	
2.6-3.0kg	86 (31%)	28 (25%)	0.004*
3.1-3.5kg	74 (27%)	36 (32%)	
>3.5kg	70 (25%)	14 (13%)	
UI in previous pregnancy (n=primiparous)	97 (35%)	11 (10%)	

Table 2. Clinical factors in relation to Urinary Incontinence vs Urinary Continence cohort at postpartum follow-up (n=360).

Variables	UI (n=161)	UC (n=199)	Total	p-value
N (%)	161 (45%)	199 (55%)	360	
Primiparous at gestation (%)	116 (69%)	51(31%)	167	0.0001*

UI Before any Pregnancy (%)	18 (100%)	0 (0%)	18	
UI During any Pregnancy (%)	115 (46%)	132 (54%)	247	
Recently acquired UI after child birth (%)	28 (29%)	67 (71%)	95	
Vaginal Delivery (%)	87 (56%)	69 (44%)	156	0.0002*
Postpartum BMI > 25 (%)	104 (59%)	72 (41%)	176	0.0001*
Caffeine consumption as >2 cups tea/coffee (%)	81 (60%)	53 (40%)	134	0.0001*
Baby's Birth weight >2.5 kg (%)	89 (54%)	76 (46%)	165	0.001*

Table 3. Type and severity of UI in pregnant (n=325) and postpartum women (n=161).

	Pregnancy (n=325)	Postpartum (n=161)
UI Type		
SUI	226 (70)	120 (74)
UII	65 (20)	29 (48)
MUI	34 (10)	12 (8)
Severity of UI		
Slight	112 (34)	76 (47)
Moderate	190 (58)	82 (51)
Severe	19 (6)	3 (2)
Very Severe	4 (1)	0
Using pads / panty liners	64 (20)	91 (56)
UI Bother		
Mild	130 (40)	68 (42)
Moderate	179 (55)	91 (57)
Severe	16 (5)	(1)

DISCUSSION:

In the present study, the prevalence of UI during pregnancy and postpartum was found to be 54% and 45%. Stress incontinence was major cause of UI in pregnancy, which is consistent with other studies.^{8,9} This study reported moderate and mild UI by 58% and 34% of pregnant women, respectively and as 51% and 45% during postpartum follow-up. However, Demircan et al. reported that 58.9% of pregnant women had mild UI, 7.1% had moderate UI, 7.1% had severe UI.¹⁰ Wesnes et al. found that 38.1% of the women had mild UI and 4.9% had severe UI at week 30 of pregnancy.¹¹

The prevalence of UI increased with gestational age in the present study and was found as 62% in second trimester, and 38% in third trimester. Other studies reported similar ascending trends.¹²⁻¹⁴ However, unlike these results, others reported no correlation between gestational age and UI.^{15,16}

Parity was significantly associated with UI, in the present study 85% of UI women were primiparous. It is stated in the studies that parity increases UI risk; the rate of UI is lower in nulliparous ones and is higher for those who have given birth many times.¹⁷

Several studies have reported protective effect of cesarean delivery.^{18,19} In the present study, UI were observed more frequently in those who had vaginal deliveries, as supported by several other studies.^{9,18}

In the present study the baby weight at last childbirth significantly affects UI development ($P = 0.004$). Similar findings are reported by other studies, where a correlation was found between big baby birth and UI in some studies.²⁰ However, no significant correlation was found in some other studies.²¹⁻²⁴

There was a statistically significant difference between the UI and UC groups in terms of BMI > 25 at conception and after child birth in the present study. Many epidemiological studies indicated that increased body mass index (BMI) was a risk factor for UI in pregnancy.^{21,18,25}

CONCLUSION:

The conclusion derived from the study conducted to determine the prevalence of urinary incontinence among pregnant and postpartum women of Gujarat using ICIQ-UI (SF):

The rate of prevalence of urinary incontinence is found to be almost equal in both the groups i.e. pregnant and postpartum women. The severity of symptoms was found to be more in pregnant women than in postpartum.

With this data, the authors aim to emphasize the importance of UI so that the complaints are not taken lightly and adequate professional assistance is provided to women with UI during and even after delivery in order to provide quality care.

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Conflict of interest: None declared

Limitation of study: One limitation of the present study was that it was based on self-reported questionnaires and there were no clinical examinations about UI. Another is the small sample size and focus is on Gujarat.

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