Assessment of Prevalence of Stress Urinary In continnence during Pregnancy

Hazem Mohamed Sammour[1], Amgad Al Said Abou-Gamrah[1], Haitham Mohamed Sabaa[1], Mohammed Nour Allah Abdel Monem Ibrahim[2]

[1]Department of Obstetrics and Gynecology, Ain Shams University, Cairo, Egypt
[2]Resident of Obstetrics and Gynecology, Damanhur Teaching Hospital, Damanhur, El Behera, Egypt
mailto:m_n_allah@hotmail.com

Abstract: Introduction and hypothesis the aim of the study was to investigate the prevalence of stress urinary incontinence during pregnancy and associated risk factors. Methods a cross sectional study of 498 women half of them in the first trimester and the other in the third trimester. Results the prevalence of stress urinary incontinence was 12.4% in the first trimester and increased to 20.4% in the third trimester. Previous history of incontinence during childhood, number of deliveries and method of delivery are the risk factors to develop stress urinary incontinence.

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1. Introduction

Stress urinary incontinence (SUI), the most common type of urinary incontinence (UI) in pregnant women, is defined by the International Continence Society (ICS) as the complaint of involuntary loss of urine on effort or physical exertion, or on sneezing or coughing **(Haylen, *et al.*, 2010).** Lower urinary tract symptoms (LUTS) and urinary incontinence in particular affect the quality of life of many men and women. Nevertheless, incontinent patients seem to accept their symptoms for years before they consult their physician **(Dumoulin et al., 2014).**

The published data on UI during pregnancy are heterogeneous and there are few studies about prevalence of urinary incontinence during pregnancy **(Sangsawang, *et al.*, 2013)**. In addition, there are few comparative data to determine whether there are any differences between the beginning and end of gestation. The female continence mechanism and factors that contribute to its failure are not completely understood. We now believe that multiple factors make up the female continence mechanism. Defects alone or in combination of any of these factors can contribute to the presence and severity of stress incontinence in women **(Walters, MD, 2007).** It's well known that pregnancy may associate with the reduction of pelvic floor muscle PFM strength which can develop the SUI. However, the exact mechanism of the development of SUI during pregnancy is remained unclear **(Viktrup, 2002).** It has been proposed that SUI is caused by both mechanical and hormonal changes that accompany pregnancy **(Hvidman, et al., 2002).**

The prevalence of SUI has been found in the range from 10% to 19% **(Franco, et al., 2014)** increases with gestational age **(Liang, *et al.*, 2012)** and is typically worst in the third trimester followed by second and first trimester respectively **(Fritel, *et al.*, 2010).** There are many risk factors associated with SUI during pregnancy. Advanced maternal age increases the risk of SUI **(Wesnes, *et al.*, 2013).** This finding was supported by **(Hvidman, *et al.*, 2002).** And it may impair blood flow and innervation to the bladder and urethra. **(Jain and Parsons, 2011).** Also women with diabetes mellitus *(DM)* are at greater risk of developing urinary incontinence than those without DM. In addition, risk is increased with the duration of DM with greater risk for those having DM for five years or more **(Lifford *et al., 2005*).** Another risk factor is prior leakage of urine before pregnancy or during previous pregnancies which may be a sign of weak connective tissue of PFM and this increases the risk of urinary incontinence with a rate higher than women who were previously continent. The weakness in PFM disturbs the supportive mechanism of urethra and bladder neck leading to increased risk of SUI **(Fritel, et al., 2004).** Preventive studies in this area are few; Pelvic floor muscle training "kegel exercises", has long been recommended to prevent the onset of stress urinary incontinence after delivery and is often taught in childbirth preparation classes ***(Nygaard and Heit, 2004).***

2. Subjects and methods

A cross-sectional study of two groups of women was conducted.

Each group consists of 250 patients with a total number of 500 patients:

Group 1: women during first trimester (less than 14 weeks of pregnancy) & Group 2: women during third trimester (more than 28 weeks of pregnancy).

Inclusion Criteria

- Women during first trimester; (less than 14 weeks of pregnancy).
- Women during third trimester; (more than 28 weeks of pregnancy).

Exclusion Criteria

- Women during the second trimester of pregnancy; (14-28 weeks of pregnancy).
- Women with symptoms of UI and anal incontinence before pregnancy (reported by themselves).
- current treatment with drugs (benzodiazepines, diuretics).
- Patients with communication problems, cognitive disorders & mental disturbances.
- Patients who underwent any previous surgery for incontinence.
- Patients who had other pelvic procedures or with impaired mobility.

(1) Full history with special emphases on:

Age, Obestetric history, Last menstural period, Parity; whether primigravida or multipara, Mode of delivery in multipara; Cesarean section, normal labor or instrumental delivery, Episiotomy, Previous miscarriage, Postpartum hemorrhage, Present history: Anal incontinence, Diabetes mellitus, Hypertension, Past history; Continence before pregnancy, Childhood enuresis.

(2) General examination:

*Blood pressure.

*Weight and height to measure body mass index (BMI) putting in mind weight gain during pregnancy.

(3) Local examination:

Stress test: to assess the stress urinary incontinence. The stress test objectively documents urinary leakage. When the patient has a full bladder, she is asked to cough or strain. The urethral meatus is observed for leakage occurring with cough. The provocative stress test is perhaps the best test in differentiating the continent from the incontinent patients.

(4) Self-reported questionnaires: (ICIQUI-SF, ISI).

ICIQUI-SF

The ICIQ-SF is a subjective measure of severity of urinary loss and quality of life for those with urinary incontinence. It's a self-reported survey, screening tool for incontinence and 4 main items (of 6 total) that ask for rating of symptoms. We take sum score of items 3, 4, 5 (items 1 and 2 are demographic) for the actual score. The final item is a self -diagnostic item that is un-scored. The ICIQ-UI SF may be divided into the following four severity categories; slight (1-5), moderate (6-12), severe (13-18) and very severe (19-21).

The data and results from questionnaire responses and risk factors associated with pregnancy with SUI will be analyzed and tabulated. The diagnosis of new onset of SUI will be based on symptoms. It will be applied when a woman answers "yes" to the SUI question and has a positive stress test.

Pregnant women with SUI will be asked about frequency and amount of leakage in order to calculate the four-level incontinence severity index. This index is calculated by multiplying the reported frequency (four levels) by the amount of leakage (three levels). The four levels of frequency and the value of each one are as follows: Less than once per month (1), A few times a month (2), A few times a week (3), Every day and/or night (4).

The three levels of the amount of leakage and the values are:

Drops (1), Small splashes (2) or more (3) The resulting: Index value (1–12) is further categorized into: Slight (1–2), Moderate (3–6), Severe (7–9), and Very severe (10-12). A study was done to compare the two questionnaires for assessing the severity of urinary incontinence: The ICIQ-UI SF versus the incontinence severity index by Avery et al. and found a high correlation between the ICIQ-UI SF and the ISI. Data were analyzed using SPSS© Statistics version 24 (IBM© Corp., Armonk, NY, USA). The primary outcome measure is the prevalence of stress urinary in continence (SUI) in the 1st and 3rd trimesters.

Sample Size Justification:

A recent study reported that the prevalence of SUI in the 1st and 3rd trimesters was approximately 10% versus 19%, respectively (**Martínez Franco et al., 2014).** Accordingly, it is estimated that a sample of 240 patients in either study group would have a power of 80% (beta error, 0.2) to detect a statistically significant difference of 9% between the two groups as regards the incidence of SUI. The incidence of SUI is assumed to equal 10% in the 1st trimester. The prevalence of SUI in the 3rd trimester is assumed to equal 10% under the null hypothesis and to equal 19% under the alternative hypothesis. This calculation used a two-sided z test with a confidence level of 95% **(alpha error, 0.05).** Normality of numerical data distribution was examined using the Shapiro-Wilk test. Normally distributed numerical variables were presented as mean ± SD and intergroup differences were compared using the unpaired t test.

Non-normally distributed numerical variables were presented as median and interquartile range and intergroup differences were compared using the

Mann-Whitney test. Categorical variables were presented as ratio or number and percentage and intergroup differences were compared using Fisher's exact test (for nominal data) or the chi-squared test for trend (for ordinal data). Multivariable logistic regression analysis was used to identify risk factors for SUI. P-value <.05 was considered statistically significant.

Table 1. Demographic characteristics of patients in both study groups

Variable	*Group 1 (n=249)*	*Group 2 (n=249)*	*p-value¶*
Age (years)	26.4 ± 5.1	27.5 ± 3.5	**0.004**
BMI (kg/m^2)	24.2 ± 2.2	24.4 ± 1.9	0.249
Gestational age (weeks)	8.6 ± 1.9	33.8 ± 3.1	**<0.001**

Data are mean ± SD. Unpaired t test.

Comment:

The table shows no statistical significance between body mass index of the two groups (p-value., 0.249) yet it shows a statistic significance regarding the gestational age (p-value,.0004) but of significant clinical value and the gestational age (p-value,.004).

Table 2. Obstetric history in both study groups

Variable	*Group 1 (n=249)*	*Group 2 (n=249)*	*p-value*
Parity			0.224¶
P0	37 (14.9%)	22 (8.8%)	
P1	50 (20.1%)	48 (19.3%)	
P2	77 (30.9%)	88 (35.3%)	
P3	49 (19.7%)	58 (23.3%)	
P4	33 (13.3%)	32 (12.9%)	
P5	3 (1.2%)	1 (0.4%)	
Previous CS			0.711¶
Nil	124 (49.8%)	123 (49.4%)	
1 CS	57 (22.9%)	52 (20.9%)	
2 CS	54 (21.7%)	59 (23.7%)	
3 CS	14 (5.6%)	15 (6.0%)	
Previous VD			0.425¶
Nil	131 (52.6%)	115 (46.2%)	
1 VD	24 (9.6%)	28 (11.2%)	
2 VD	39 (15.7%)	49 (19.7%)	
3 VD	34 (13.7%)	39 (15.7%)	
4 VD	18 (7.2%)	17 (6.8%)	
5 VD	3 (1.2%)	1 (0.4%)	
Previous vacuum/instrumental delivery	2 (0.8%)	0 (0.0%)	0.499§

Data are number (%). Chi-squared test for trend. §Fisher's exact test.

Comment:

There was no statistical significance between the two groups regarding the parity (P-value,.224) and whether it was normal vaginal delivery (p-value,0.425), cesarean section (p-value,.0711) or vaginal instrumental delivery (p-value,0.499).

Table 3. Medical history in both study groups

Variable	*Group 1 (n=249)*	*Group 2 (n=249)*	*P-value¶*
Childhood urinary incontinence	6 (2.4%)	15 (6.0%)	0.072
Hypertension	7 (2.8%)	11 (4.4%)	0.472
DM	12 (4.8%)	12 (4.8%)	1.000
Bronchial asthma	5 (2.0%)	8 (3.2%)	0.576
Chronic constipation	5 (2.0%)	9 (3.6%)	0.417

Data are number (%). Fisher's exact test.

Comment: This table shows no statistical significance regarding the medical history on both study groups (P-value, >0.05).

Table 4. Incidence of SUI in both study groups

Variable	*Group 1 (n=249)*	*Group 2 (n=249)*	*p-value¶*
SUI	31 (12.4%)	51 (20.5%)	**0.021**
Risk analysis			
Unadjusted odds ratio	1.81		
95% CI	1.11 to 2.95		
z statistic	2.395		
Significance level§	**p =.017**		

Data are number (%). Chi-squared test for trend. §Fisher's exact test. §Z test.

Comment: This table shows a statistical significance regarding the prevalence of SUI in the first trimester 12.4% and the third trimester 20.5% (p-value, 0.021).

Table 5. Severity of SUI and QoL score in patients developing SUI in either study group

	Timing of SUI		
Variable	**First trimester SUI (n=31)**	**Third trimester SUI (n=51)**	**p-value**
Incontinence severity index	3 (2 – 4)	2 (1 – 4)	**.021¶**
Severity of SUI			.056§
Mild	8 (25.8%)	32 (62.7%)	
Moderate	20 (64.5%)	11 (21.6%)	
Severe	3 (9.7%)	8 (15.7%)	
Qol ICIQ-SF	5 (3 – 6)	4 (3 – 7)	.988¶

Data are median (interquartile range) or number (%). Mann-Whitney test. §Chi-squared test for trend.

Comment: There is no statistical significance regarding the incontinence severity index in the first trimester and third triimesters (p-value,0.56).

e 3. Box plot showing the incontinence severity index in patients developing SUI in either study group. Box represents the range from the 1st quartile to 3rd quartile. Line inside the box represents the median (2nd quartile). Error bars represent the minimum and maximum values excluding outliers (rounded markers).

Table 6. Characteristics of patients with or without SUI

Variable	*No SUI (n=416)*	*SUI (n=82)*	*p-value*
Demographic characteristics			
Age (years)	26.8 ± 4.4	27.7 ± 4.3	.082¶
BMI (kg/m2)	24.2 ± 2.1	24.7 ± 2.0	.071¶
Gestational age (weeks)	12 (9 – 33.5)	32 (9 – 36)	**<.001§**
Trimester			**.021¥**
First trimester	218 (52.4%)	31 (37.8%)	
Third trimester	198 (47.6%)	51 (62.2%)	
Obstetric history			
Number of previous CS	1 (0 – 2)	0 (0 – 1)	**.003§**
Number of previous VD	0 (0 – 2)	2 (0 – 3)	**.001§**
Total number of previous deliveries (parity)	2 (1 – 3)	2 (2 – 3)	.085§
History of vacuum/instrumental delivery	1 (0.2%)	1 (1.2%)	.302¥
Medical history			
History of childhood urinary incontinence	11 (2.6%)	10 (12.2%)	**.001¥**
History of hypertension	11 (2.6%)	7 (8.5%)	**.017¥**
History of DM	17 (4.1%)	7 (8.5%)	.093¥
History of bronchial asthma & chest disease	8 (1.9%)	5 (6.1%)	**.047¥**
History of chronic constipation	10 (2.4%)	4 (4.9%)	.263¥

Data are mean ± SD, median (interquartile range) or number (%). ¶Unpaired t test. §Mann-Whitney test. ¥Fisher's exact test.

Comment: When comparing the incontinent and the continent patients we find that gestational age is a risk factor with a statistical significance (p-value, 0.001).

The majority of incontinent females 62.2% were in the third trimester vs 37.8% in the first trimester and it was statistically significant (p-value, 0.021). Statistical significance regarding the relation between increased number of vaginal deliveries and stress incontinence (p-value, 0.01).

Patients with history of childhood urinary incontinence (p-value, 0.01) & who have or had hypertension (p-value, 0.017) & with a history of chronic lung disease (p-value, 0.047) have a statistical significant in contrary to those with DM and chronic constipation.

Table 7. Details of obstetric history in patients with or without SUI

Variable	*No SUI (n=416)*	*SUI (n=82)*	*p-value¶*

Previous CS			**.007**
Nil	193 (46.4%)	54 (65.9%)	
1 CS	95 (22.8%)	14 (17.1%)	
2 CS	105 (25.2%)	8 (9.8%)	
3 CS	23 (5.5%)	6 (7.3%)	
Previous VD			**.003**
Nil	219 (52.6%)	27 (32.9%)	
1 VD	45 (10.8%)	7 (8.5%)	
2 VD	65 (15.6%)	23 (28.0%)	
3 VD	54 (13.0%)	19 (23.2%)	
4 VD	29 (7.0%)	6 (7.3%)	
5 VD	4 (1.0%)	0 (0.0%)	
Parity			0.212
P0	47 (11.3%)	12 (14.6%)	
P1	92 (22.1%)	6 (7.3%)	
P2	140 (33.7%)	25 (30.5%)	
P3	77 (18.5%)	30 (36.6%)	
P4	56 (13.5%)	9 (11.0%)	
P5	4 (1.0%)	0 (0.0%)	

Data are number (%). Chi-squared test for trend.

Comment: The number of previous cesarean deliveries showed a statistical significance (p-value, 0.007) and vaginal deliveries (p-value, 0.03) denoting that incontinence is linked with vaginal delivery as a risk factor. Parity showed no statistical significance (p-value, 0.212).

Variable	*B*	*SE*	*p-value*	*Odds ratio*	*95% CI*
Third trimester pregnancy†	0.51	0.25	**.044**	1.67	1.01 to 2.76
Number of previous vaginal deliveries	0.23	0.09	**.007**	1.26	1.06 to 1.49
Hypertension‡	0.75	0.54	.162	2.12	0.74 to 6.09
History of childhood incontinence§	1.45	0.48	**.002**	4.26	1.68 to 10.81
Constant	-2.35				

B, regression coefficient; SE, standard error. †Referenced to first trimester. ‡ Referenced to no hypertension. §Referenced to no childhood incontinence.

Comment Third-trimester pregnancy (p-value,.044), number of previous vaginal deliveries (p-value,.007), and history of childhood incontinence (p-value,.002), were independent risk factors for SUI.

Table 9. Multivariable binary logistic regression analysis for risk factors of SUI based on gestational age

Variable	*B*	*SE*	*p-value*	*Odds ratio*	*95% CI*
Gestational age (weeks)	0.03	0.01	**.009**	1.03	1.01 to 1.05
Number of previous vaginal deliveries	0.23	0.09	**.008**	1.26	1.06 to 1.49
Hypertension†	0.76	0.54	.156	2.15	0.75 to 6.19
Childhood incontinence‡	1.45	0.48	**.002**	4.25	1.67 to 10.79
Constant	-2.66				

B, regression coefficient; SE, standard error. †Referenced to no hypertension. ‡Referenced to no childhood incontinence.

Comment Gestational age (p-value,.009), number of previous vaginal deliveries (p-value,.008), and history of childhood incontinence (p-value,.002), were independent risk factors for SUI.

4. Discussion

The main objective of this study is to determine the prevalence of SUI during pregnancy and whether there are any differences between the characteristics of incontinence and affected women during the first and third trimesters of pregnancy.

In our study, the prevalence of SUI in the first trimester of pregnancy was approximately 12.4% and in the third trimester was 20.5% **(table 4).** The prevalence increases with gestational age. 37.8% of SUI cases occurred in the first trimester vs. 62.2% in the 3rd trimester **(table 6).**

Our study was close in results with **Martinez Franco, et al.** who conducted a study in which, the primary outcome measure was the prevalence of stress urinary incontinence (SUI) in the 1st and 3rd trimesters & they reported that the prevalence of SUI in the 1st and 3rd trimesters was approximately 10% versus 19%, respectively.

Also **Zhu et al.** reported the prevalence of UI, **SUI,** UUI, and MUI to be 26.7 %, **18.6 %**, 2.0 %, and

4.3 %, respectively, in Chinese women during late pregnancy.

On the other hand some studies showed different results than ours; **Solans-Domenech et al.** found that the prevalence of antenatal UI during first, second, and third trimester of pregnancy was similar to the respective prevalence of 8.3 %, 32 %, and 35% in nulliparous Caucasian women who were continent before pregnancy. The prevalence of antenatal SUI and UUI at different trimesters was also similar.

A large population-based survey in Norway, the Mo Ba Study **(Wenses et al.,2007),** using a self-administrated questionnaire, indicated a prevalence of SUI symptoms of 42.6% among nearly 20,000 nulliparous women in the 30th week of pregnancy. **Van Brummen et al**. published a similar prevalence rate using the urogenital distress inventory.

Chaliha et al. reported an SUI prevalence rate of 35.7% in nulliparous women in the third trimester, and **Viktrup et al.** indicated a prevalence rate of 32.1% in nulliparous pregnant women at term.

The different results may be due to larger size sample and different methodology; **Wenses et al.** used a cohort study with a sample of43,279 pregnant women (nulliparous, primiparous and multiparous) while **Viktrup et al.** used a Prospective study & a sample of 305 Primiparous women. **Solans-Domenech et al.** used a cohort study with a sample of 1,279 healthy, continent, nulliparous pregnant women who were monitored throughout pregnancy and postpartum.

Regarding body mass index; our study showed no statistical difference between BMI in the continent vs incontinent women (p-value, 0.071). **(Table 6).**

Our results were similar to **Scarpa et al.** who weren't able to find any such association when they considered BMI≥30 in the third trimester of pregnancy & neither did **Chiarelli et al.** when they analyzed the association between BMI at term and SUI prevalence during the final month of pregnancy.

Also **Martinez Franco et al.** showed statistically significant differences in this parameter; pregnant women with urinary incontinence during pregnancy had a higher BMI than unaffected women (27.82 vs. 25.92; p = 0.01). This difference was maintained when they analyzed both trimesters, but this difference is not statistically significant when both trimesters are separately analyzed.

On the other hand some studies had different results than ours; **Glazener et al.** demonstrated that all women with de novo SUI during pregnancy had a BMI above 25 (OR 1.68, 95% CI: 1.12–2.43).

Liang et al. showed that the women with a pre-pregnancy BMI >30 kg/m2 were at increased risk of developing de novo SUI during pregnancy.

In another study, **Diez-Itza et al.** indicated that increased body weight >75 kg is an independent risk factor for developing SUI during pregnancy.

Wesnes et al. reported that the prevalence of incontinence in pregnancy increased with increasing BMI. They considered the weight in the 30th week of pregnancy and included both nulliparous and parous women.

Hvidman et al. indicated that a BMI≥30 after delivery correlated with prevalence of urinary incontinence during pregnancy.

Regarding the mode of delivery & number of parities and its effect on developing SUI; our study showed a statistical significance between the mode of delivery and SUI; vaginal delivery increased the rate of SUI (p-value, 0.001) while CS was associated more with continent women (p-value, 0.03) **(table 6).**

When the number of previous vaginal deliveries was analyzed according to the trimesters of pregnancy"1st & 3rd"there was a statistical significance (p-value, 0.007) (OR: 1.28, 95%CI: 1.06 to 1.49) **(table 8) &** when it was analyzed as a risk factor for SUI based on gestational age, there was a statistical significance (p-value, 0.008) with (OR: 1.26, 95%CI: 1.06 to 1.49) **(Table 9).**

Our results came matching with many studies; **(Huebner et al., 2010) & (Boyles et al., 2009) & (Rortveit et al., 2003)** found that in some cases; vaginal delivery increased the rate of urinary incontinence**.**

Findik et al. analyzed the relations between mode of delivery and SI separately. Although a significant increase in SI was established with increasing numbers of pregnancies (p = 0), there was no significant relation between SI and CS (p = 0.132) and they found that cesarean section seems to offer protection from urinary incontinence; when elective C/S, post-labor C/S and pushing/expulsion C/S were compared, the risk of urinary continence was found to be the same in all of them **(Findik et al., 2012).**

Boyles et al. showed a relation between vaginal delivery and SUI; the later stages of the fetus's descent through the vagina during delivery seem to cause the major negative effect on continence possibly because of connective tissue damage due to episiotomy. Hypoxic muscle damage due to mechanical pressure may also play a role **(Boyles et al., 2009).**

Burgio et al. have found a certain threshold for the number of deliveries as risk factor for incontinence **(Burgio et al., 1996)** and **Wenses et al.** suggest that the first delivery has the strongest effect on urinary incontinence before a new pregnancy, but subsequent deliveries also add to the risk for incontinence **(Wenses et al., 2007).**

Our study showed no statistical significance regarding the maternal age between the continent vs. incontinent women (p-value 0.082) **(Table 6).**

In our study; Bronchial asthma & chest disease showed no statistical significance when compared to both groups (p-value, 0.576) **(table 3)** but there was a statistical significance between continent and incontinent women (p-value, 0.047) and it also shows that the history of DM between both continent and incontinent women wasn't significant (p-value, 0.093) **(table 6).**

Our study shows a statistical significance regarding those women with a history of childhood urinary incontinence between both continent women and those who developed SUI in pregnancy (p-value, 0.01). However, there was no significant difference regarding previous urinary incontinence during childhood in both study groups (p-value, 0.072) **(Table 3).**

When the results were analyzed regarding the risk factors of SUI based on trimester of pregnancy, there was a significant difference between females with previous history of UI in childhood and those without any previous history of UI (p-value,0.002) (OR: 4.26, 95% CI:1.68 to 10.81) **(Table 8)** and when there was an analysis for risk factors of SUI based on gestational age, we found a significant difference between females with previous history of UI in childhood and those without any previous history of UI (p-value, 0.002) (OR:4.25, 95% CI:1.67 TO 10.79).

Our study shows a statistical significance regarding the history of hypertension in continent and those suffering from SUI (p-value, 0.017) **(table 6)** but when it was analyzed according to trimesters of pregnancy, hypertension showed no statistical significance as an independent risk factor for developing SUI (p-value 0.162) (95% CI: 0.74 to 6.09) **(table 8)** and it also showed that chronic GIT problems & constipation have no significance as a risk factor for developing SUI (p-value, 0.263).

Our results matched **Martinez Franco et al**. who also found no statistical significance between the maternal age in continent women and those with SUI (p-value, 0.96) and didn't find any significance of lung disease as a potential risk factor for urinary incontinence (p-value, 0.68) & didn't find any significant relationship between diabetes mellitus and urinary incontinence (p-value, 0.76). Also **Martinez Franco et al.** showed that hypertension has no significant role in the development of urinary incontinence when compared continent to incontinent women (p-value,1).

Regarding having incontinence before pregnancy; our results matched **(Burgio et al., 1996) & (Hvidman et al., 2002)** who found that having a childhood incontinence is a significant risk factor of incontinence during pregnancy. **Wenses et al.** have shown that having incontinence before pregnancy is a significant risk factor of incontinence during pregnancy. It was not surprising women who were incontinent at the start of pregnancy did not get better in pregnancy **(Wenses et al., 2007).**

In our study, the impact on the quality of life, assessed with the response obtained from the question of the **ICIQ-SF**, showed a mean value of **0.988** among all the incontinence pregnant women. The average score, in the cohort of first trimester, is 5 (3–6) and in the third trimester, 4 (3–7) **(table 7).**

The breakdown of values is shown in **Table 7**; the total score obtained in pregnant women with incontinence on the ICIQ-SF questionnaire was 5 points, of a maximum total of 21 in 1st trimester and 4 points in 3rd trimester **(Table 7)**. There were no statistically significant differences between the two trimesters of pregnancy (p-value,0.988).

Of the total number of pregnant women who completed this questionnaire, 82 women reported having frequent micturition in the specific question 'Do you experience when you cough, strain or exercise? And if so, how much are you bothered by frequent urination?''**(Table 4)**: 31(12.4%) in group 1 and 51 (20.5%) in group 2, with no statistically significant differences (p-value, 0.988).

Women with affirmative response in this question are asked about the discomfort generated by this symptom: it causes ''mild'' discomfort in 25.8%, "moderate" discomfort in 64.5%, and ''severe'' discomfort in 9.7% of cases during the first trimester and at the 3rd trimester, the results were "mild" 62.7%, "moderate" 21.6% and "severe" 15.7%. There was a significant difference regarding the severity index being more severe in the first trimester (p-value, 0.021) **(table 7).**

This finding is common to all publications on the topic, possibly because women have tended to consider UI as being associated with pregnancy itself, although this trend is undergoing a change, which is one of the motives for studies such as ours.

Our results were close to **Martinez Franco et al.** who found that 32.47% of the pregnant women with UI did not report that their quality of life was impaired by their symptoms. In group 1, the highest reported impact on the quality of life was 5 points. In contrast, in group 2, 9.1% of women reported moderate– severe impairment of their quality of life, with scores of between 6 and 10 & this result is similar to our study regarding the severity of UI being higher in the 1st trimester.

Nevertheless, the impact on quality of life was low, with an average score on the specific question of the ICIQ-SF of 2 (0–5) in the cohort of first trimester and of 2.1 (0–10) in the third trimester. This is

different from our study may be due to socioeconomic differences between the groups regarding degree of affection to quality of life.

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