Gestational and Postpartum Urinary Incontinence at Mansoura University Hospital

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Abstract

Background: Adult women of all ages are frequently affected by urinary incontinence (UI), which can have a detrimental effect on quality of life. Although the cause of UI is complex, several major risk factors include aging, obesity, and unfavorable obstetric events. The genesis of UI has been linked to pregnancy and childbirth. The impact of childbirth on the risk of UI is still up for debate, despite numerous research showing a clear, short-, medium-, and long-term correlation between UI and vaginal delivery.

Objective: To study the prevalence and risk factors of urinary incontinence in nulliparous women in Mansoura university hospitals , the prevalence of postpartum urinary incontinence and the effect of mode of delivery on the prevalence postpartum urinary incontinence.

Patients and Methods: The present study was a cross sectional study at Mansoura university hospitals (MUH) including nulliparous pregnant women. 105 Pregnant women asked to answer a questionnaire. urine leakage that occurs involuntarily during effort, exertion, sneezing, or coughing is known as SUI leakage; urine leakage that occurs involuntarily during effort, exertion, or right before urgency is known as UUI leakage; and urine leakage that occurs involuntarily during exertion, effort, sneezing, or coughing is known as MUI leakage.

Results: The study also questioned change in urination style, complaints related to the urinary system frequency of urination during follow up and illustrates that there is statistically significant increase in frequency of urination from 5.7% ranging from 11-15 times/day that increased to 11.4% ranging from 11 to 15 times/ day in second trimester then become 31.4% from 11 to 15 times/ day then decrease of frequency of urination to 5.7% from 11 to 15 , 1% more than 15 times/day that decreased to 7.6% from 5 to 10 and 92.4% from 0 to 5 at 3 months. .A statistically significant increase in frequency of nocturnal urination during follow up from first to second trimester then 3rd trimester then decrease for 48 hours , one month and 2 months follow up. For first trimester;

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51.4% none , 22.9% twice , 17.1% once and 8.6% three times. .A statistically significant increase incidence of burning during micturition during follow up from first to second trimester then 3rd trimester then decrease for 48 hours , one month and 2 months follow up. significant change in amount of urine during follow up from first trimester to one month ($p<0.001$) and from first trimester to 3 months follow up ($p=0.002$).

Conclusion: Urinary incontinence is one of the common disorders during pregnancy and postpartum period which can affect quality of women's life significantly. The effect of mode of delivery C.S 77.1% and vaginal delivery 22.9%. a non-statistically significant relation between urinary incontinence during follow up and age , period of gestation and mode of delivery among studied cases ($p>0.05$).

Introduction:

Numerous anatomical and functional conditions fall under the category of pelvic floor dysfunctions (e.g., hyper-function: defecatory dysfunction, sexual dysfunction, and voiding dysfunction; hypo-function: urine incontinence, fecal incontinence, and pelvic organ prolapse).

As a result, these prevalences may be underestimated because the majority of epidemiological studies rely on self-report data, which may skew the true incidence of pelvic floor dysfunctions.

According to epidemiological studies, pelvic floor dysfunction is linked to unfavorable obstetric occurrences. The physiological and structural changes that occur during pregnancy have been linked to lower urinary tract symptoms (LUTSs) both during and after childbirth. In Brazil, LUTSs were found in 63.8% of expectant mothers. (1) Nevertheless, those symptoms are temporary and go away a few months after delivery, therefore no additional research is needed.

Urinary incontinence (UI) is described as "the complaint of any involuntary leakage of urine" in the most recent definition provided by the International Continence Society (ICS). Even though UI is not a fatal ailment, it is a prevalent, bothersome, and costly condition that significantly lowers a woman's quality of life. (2)

To improve the management and treatment of impacted patients, physicians and health researchers have looked at the factors influencing the prevalence of UI in great detail in recent years.

However, because there are significant methodological discrepancies among the studies, it is challenging to derive precise prevalence numbers from the literature. (3, 4) The fact that women experience UI more frequently than males does not change the significance of circumstances like pregnancy in contributing to UI.

Consequently, The purpose of this research was to look into the prevalence of UI in nulliparous women and to give a summary of the risk variables that are connected to UI. additionally, to study the frequency of postpartum urine incontinence and the impact of delivery mode on the frequency of postpartum urine incontinence.

AIM OF THE WORK

The purpose of this research is to examine the prevalence of postpartum urine incontinence and its relationship to the mode of delivery, as well as the risk factors and prevalence of urinary incontinence in nulliparous women attending Mansoura University Hospitals.

PATIENTS AND METHODS

Study Area and design: This was a cross sectional study, carried out on 106 nulliparous women who came to obstetrics and gynecology department in Mansoura University Hospitals. Mansoura University Hospital is Referral teaching hospital.

Study Population:

Inclusion Criteria: Pregnant women aged 18 –40 years. Nulliparous pregnant. Nulliparous pregnant with: Change in urination style, such as straining to urinate, difficult urination, discontinuous urination, and more frequent urination than before pregnancy. Urinary tract complaints include pain and burning sensations, which could indicate an infection. Changes pertaining to the bladder, such as the sensation of fullness within the bladder, were evaluated.

Exclusion Criteria: Those suffering from systemic diseases like diabetes mellitus. A state of obesity. elevated blood pressure. bladder system issues, individuals who have undergone prior pelvic floor surgery.

Sample Size: Sample size was 105 nulliparous women.

Study design and steps:

Pregnant women will be asked to answer a questionnaire including information on maternal age, parity height, pre-pregnancy weight, education

The study used this questionnaire three times during different periods of gestation (first, second, third) trimester. The study queried about complaint of involuntary loss of urine on effort or physical exertion or sneezing or coughing (SUI), strong, sudden need to urinate (UUI), and complaint of features of both SUI and UUI. Change in urination style may be reported as, urination more frequently than before pregnancy, discontinuous urination, difficult urination, straining for urination. Complaints related to the urinary system are pain and burning sensation which may denote urinary tract infection. Changes pertaining to the bladder, such as the sensation of fullness within the bladder, were evaluated.

Ethical Consideration:

The hospital's ethical committee approved this study, and patients gave their informed consent after being fully told about the study's objectives, risks, and procedures. The study approved by the Ethics Committee of Faculty of Medicine, Mansoura University. The following sufficient safeguards are in place to protect participant privacy and data confidentiality: Each participant received a code number, and their address and name were stored in a unique file. The patient's identity will be kept confidential while the study is being conducted. The study's findings were only applied in a scientific manner; no other purposes were pursued.

The benefits of the study to the subjects included in the study:

The appropriate diagnosis and management of disease.

Statistical analysis

Version 22 of the statistical software for social sciences, or SPSS, will be used to examine the data. Quantitative data will be expressed as mean and standard deviation for normally distributed data and median and range for non-normally distributed data after being evaluated for normalcy using the Kolmogrov-Smirnov test. Qualitative data will be presented as number and percent. Depending on the type of data, the relevant statistical test will be used; the following tests are recommended: For a categorical variable, use Chi-Square. For continuous variables, there is the Mann Whitney U test and the Student t test.

RESULTS

Table (1): demographic characteristics and obstetric history of the studied cases

n=105	%
Age/years (mean±SD)	29.95±6.63
Period of gestation/weeks Median (min-max)	20(5-38)

Mode of delivery **Vaginal** **CS**	 24 81	 22.9 77.1

Table (2) mean age of the study group is 29.95 ±6.63 , median period of gestation is 20 weeks and 77.1% of the study group delivered by C.S and 22.9%delivered vaginally.

Table (2): changes in frequency of micturition during follow up among studied cases.

Frequency of urination	n	%
First trimester **5-10** **11-15**	n=35 33 2	 94.3 5.7
Second trimester **5-10** **11-15**	n=35 62 8	 88.6 11.4
3rd trimester **5-10** **11-15** **>15**	 70 33 2	 66.7 31.4 1.9
48 h **0-5** **5-10** **11-15** **>15**	 11 59 29 6	 10.5 56.2 27.6 5.7
One month **0-5** **5-10** **11-15** **>15**	 79 19 6 1	 75.2 18.1 5.7 1.0
3 months **0-5** **5-10**	 97 8	 92.4 7.6
test of significance	Friedman test =116.71 p<0.001*	
within group significance	p1<0.001* , p2<0.001*, p3<0.001*, p4<0.001* p5<0.001*	

Type (2):demonstrates frequency of urination during follow up and illustrates that there is statistically significant increase in frequency of urination from 5.7% ranging from 11-15 times/day that increased to 11.4% ranging from 11 to 15 times/ day in second trimester then become 31.4% from 11 to 15 times/ day then decrease of frequency of urination to 5.7% from 11 to 15 , 1% more than 15 times/day that decreased to 7.6% from 5 to 10 and 92.4% from 0 to 5 at 3 months.

Table (3): changes in frequency of nocturnal urination during follow up among studied cases.

Nocturnal urination	n	%
First trimester	n=35	
none	18	51.4
1	6	17.1
2	8	22.9
3	3	8.6
Second trimester	n=70	
none	39	55.7
1	9	12.9
2	9	12.9
3	13	18.6
3rd trimester	n=105	
none	20	19.0
1	37	35.2
2	28	26.7
3	20	19.0
48 h		
none	31	29.5
1	30	28.6
2	26	24.8
3	18	17.1
One month		
none	77	73.3
1	17	16.2
2	6	5.7
3	5	4.8
3 months		
none	102	97.1
1	1	1.0
2	2	1.9
test of significance	Friedman test =70.98 p<0.001*	
within group significance	p1<0.001* , p2<0.001*, p3<0.001*, p4<0.001* p5<0.001*	

Table (3) illustrates frequency of nocturnal urination during follow up among studied cases .A statistically significant increase in frequency of nocturnal urination during follow up from first to second trimester then 3rd trimester then decrease for 48 hours , one month and 2 months follow up. For first trimester ; 51.4% none , 22.9% twice , 17.1% once and 8.6% three times , for second trimester ; 55.7% none , 18.6% three times , 12.9% twice and 12.9% once , for third trimester ; 35.2% once, 26.7% twice, 19% three times and 19% none. For 48H ; 29.5% none, 28.6% once , 24.8% twice and 17.1% three times . For one month ; 73.3% none, 16.2% once , 5.7% twice and 4.8% three times . For three month ; 97.1% none, 1.9% twice and 1% once.

Table (4): changes in frequency of burning during micturition during follow up among studied cases.

burning during micturition	n	%
First trimester **No** **Yes**	n=35 3 32	 8.6 91.4
Second trimester **No** **Yes**	n=70 2 68	 2.9 97.1
3rd trimester **No** **Yes**	n=105 4 101	 3.8 96.2
48 h **No** **Yes**	 10 95	 9.5 90.5
One month **No** **Yes**	 73 32	 69.5 30.5
3 months **No** **Yes**	 101 4	 96.2 3.8
test of significance	Friedman test =119.14 p<0.001*	
within group significance	p1<0.001* , p2<0.001*, p3<0.001*, p4<0.001* p5<0.001*	

Table (4) demonstrates frequency of burning during micturition during follow up among studied cases .A statistically significant increase incidence of burning during micturition during follow up from first to second trimester then 3rd trimester then decrease for 48 hours , one month and 2 months follow up. Burning during micturition is detected among 91.4% at first trimester , 97.1% for second trimester, 96.2% for third trimester 90.5% for 48 H, 30.5% for one month and 3.8% for third months follow up.

Table (5): changes in urinary incontinence during follow up among studied cases.

urinary incontinence	n	%
First trimester	n=35	
Absent	1	2.9
Urge	14	40.0
Stress	8	22.9
Mixed	12	34.3
Second trimester	n=70	
Absent	1	1.4
Urge	24	34.3
Stress	10	14.3
Mixed	35	50.0
3rd trimester	n=105	
Urge	50	47.6
Stress	16	15.2
Mixed	39	37.1
48 h		
Absent	2	1.9
Urge	45	42.9
Stress	22	21.0
Mixed	36	34.3
One month		
Absent	38	36.2
Urge	23	21.9
Stress	32	30.5
Mixed	12	11.4
3 months		
Absent	97	92.4
Urge	2	1.9
Stress	6	5.7
test of significance	Friedman test =104.51 p<0.001*	
within group significance	p1<0.001* , p2<0.001*, p3<0.001*, p4<0.001* p5<0.001*	

Table (5) illustrates frequency of urinary incontinence during follow up among studied cases .A statistically significant increase in incidence of urinary incontinence during follow up from first to second trimester then 3rd trimester then decrease for 48 hours , one month and 2 months follow up. Urinary incontinence is distributed as following .For first trimester ; 40% urge , 34.3%mixed , 22.9% stress & 2.9% absent. For second trimester ; 50% mixed , 34.3%urge , 14.3% stress & 1.4% absent. For third trimester ; 47.6% urge , 37.1%mixed and 15.2% stress. For 48h ; 42.9% urge , 34.3%mixed , 21% stress and 1.9% absent. For one month ; 36.2% absent , 30.5% stress, 21.9% urge and 11.4% mixed. For three months ; 92.4% absent , 5.7% stress, 1.9% urge.

Table (6): changes in amount during follow up among studied cases .

Amount	n	%
First trimester **Droplet** **Stream**	n=35 17 18	 48.6 51.4
Second trimester **Droplet** **Stream**	n=70 25 45	 35.7 64.3
3rd trimester **Droplet** **Stream**	n=105 25 80	 23.8 76.2
48 h **Droplet** **Stream**	 28 77	 26.7 73.3
One month **Droplet** **Stream**	 20 85	 19.0 81.0
3 months **Droplet** **Stream**	 7 98	 6.6 93.3
test of significance	Friedman test =35.58 p<0.001*	
within group significance	p1<0.001* , p2<0.001*, p3<0.001*, p4<0.001* p5<0.001*	

Table (6) illustrates amount of urination during follow up among studied cases . A statistically significant change in amount of urine during follow up from first trimester to one month (p<0.001) and from first trimester to 3 months follow up (p=0.002).Stream urination changed from 51.4% at first trimester to 64.3% at second trimester , 76.2% at third trimester , 73.3%at 48 hours , 81% at one month and 93.3% at 3 months .

Table (7): changes in bothering in daily life during follow up among studied cases.

Bothering in daily life	n	%
First trimester	n=35	
None	2	5.7
Slight	29	82.9
Some	4	11.4
Second trimester	n=70	
None	4	5.7
Slight	27	38.6
Some	34	48.6
severe	5	7.1
3rd trimester	n=105	
Slight	22	21.0
Some	38	36.2
severe	45	42.9
48 h		
None	7	6.7
Slight	21	20.0
Some	34	32.4
severe	43	41.0
One month		
None	61	58.1
Slight	21	20.0
Some	12	11.4
severe	11	10.5
3 months		
None	98	93.3
Slight	6	5.7
Some	1	1.0
test of significance	Friedman test =105.42 p<0.001*	
within group significance	p1<0.001* , p2<0.001*, p3<0.001*, p4<0.001* p5<0.001*	

Table (7) demonstrates bothering in daily life during follow up among studied cases .A statistically significant high grade of bothering is detected during follow up from first , second to third trimester , while statistically significant increase is detected after that for 48 h to one & three months. For first trimester ; 11.4% have some bothering that increased to 48.6% some bothering and 7.1% sever bothering at second trimester then increased to 41% severe bothering at 48 hours , 10.5% severe bothering at one month that improved at 3 months to be only 1% some bothering .

DISCUSSION

A common postpartum consequence is urinary incontinence (UI), a health problem linked to a lower quality of life for women worldwide. The majority of occurrences of urine incontinence (UI) are caused by stress. (5)

The trauma experienced after delivery is one of the main risk factors for SUI in women, however the etiology of this condition is complex. Many SUI women eventually develop persistent UI because they are unable to heal during the postpartum period. (6).

Urge urinary incontinence (UUI), which affects 36% of the individuals in the study, is one of the several types of involuntary urine leaking that can coexist with SUI. Even though symptoms could be severe, very few patients decide to get medical attention. (7)

Vaginal delivery and labor involving vacuum extraction or forceps are thought to significantly increase the prevalence of postpartum SUI, according to numerous research. On the other hand, it is established that cesarean delivery—particularly an elective one—protects against postpartum SUI. (8)

The variables linked to the emergence of postpartum SUI in diverse groups, however, still need to be assessed. There are differences in the short- and long-term factors influencing postpartum SUI. (9)

Therefore, the current study aimed to assess the prevalence and risk factor of urinary incontinence in nulliparous women in Mansoura hospital and prevalence of postpartum urinary incontinence. The current study included 105 nulliparous pregnant women.

The current study showed that the mean age of the studied cases was 29.95 ±6.63, median period of gestation was 20 weeks ranging from 5 to 38 and mode of delivery 77.1% Cesarean section and 22.9 vaginal delivery.

Similarly, Lima et al. (10) study showed that the average age of prim parous women was 22.9 ± 3.9 years old and in contrast to our study mode of delivery was spontaneous vaginal in 352 (70.4%) cases ,instrumental vaginal 25(5%) cases and cesarean section in 125(24.6%) cases attributed increase rate of cesarean section in Egypt .

As opposed to our investigation, Rajavuori et al. (11) reported that 428 (78.2%) of the cases had spontaneous vaginal delivery, 43 (7.9%) had instrumental vaginal delivery, and 76 (13.9%) had cesarean section delivery. A varied sample size may be the cause of the discrepancy.

The current study demonstrated the frequency of urination during follow up showing statistically significant increase in frequency of urination (11-15) from 5.7% in first trimester that increased to 11.4% in second trimester then become 31.4% in third trimester then decrease of frequency of urination (11-15) to 27.6% after 48 hour postpartum, decrease to 5.7% one month postpartum and 7.6% from (5-10)daily at 3 months postpartum.

According to Yates (12), who concurred with our findings, the uterus compresses the bladder throughout the first and third trimesters, making this period of time the most prevalent for urine frequency, which increases until term. The main causes include increased renal blood flow (RBF), increased GFR, hypervolemia (fluid overload), and the effects of hormonal changes. It is most likely solely affected by the pressure inside the uterus in the latter weeks of pregnancy.

According to Hee P, Lose G, Beier-Holgersen R, Engdahl E, Falkenlove P, uroflowmetry, residual urine (RU) measurements (ultrasonography), frequency of urination, the voiding pattern following a "normal" vaginal delivery, and 51 primiparous women, these tests were carried out at the first postpartum voiding and on the third and fifth postpartum days. The immediate postpartum period saw a considerable decrease in the adjusted (for

volume differences) peak flow rate.

The current study illustrated a statistically significant increase the frequency of nocturnal urination during follow up among studied cases from first to second trimester then 3rd trimester then decrease for 48 hours , one month and 2 months follow up.

The current study illustrated a statistically significant increase frequency of burning during micturition during follow up among studied cases from first to second trimester then 3rd trimester then decrease for 48 hours, one month and 2 months follow up.

Changes in the urinary tract during pregnancy make women more vulnerable to infection. Compression of the ureters from the gravid uterus causes ureteral dilatation. Progesterone's hormonal effects can also relax smooth muscles, which can result in dilatation and urine stasis, as well as an increase in vesicoureteral reflux. (13)

Interestingly, the current study illustrated a statistically significant increase in the frequency of urinary incontinence during follow up among studied cases from first to second trimester then 3rd trimester then decrease for 48 hours, one month and 2 months follow up post-delivery.

In harmony with our results, Sangsawang et al. (14) reported that the third trimester had the highest prevalence, which was followed by the second and first trimesters. In the first trimester, only 13–19% of cases were reported. While the prevalence in the second trimester was similar at 19.2%, the third trimester had a noticeably greater prevalence: 37.5 %.

When Wesnes et al. (15) reported questionnaire data from the Norwegian Institute of Public Health's Norwegian Mother and Child Cohort Study, they discovered that SUI was the most prevalent type of UI, occurring in high prevalence in both nulliparous and multiparous women (31% and 42%, respectively).

Also, Mørkved et al. (16) from Norway discovered that 42% of pregnancies ended in SUI. The same study found that 8 weeks after delivery, 38% of women experienced SUI.

Furthermore, the prevalence of UI declines throughout the postpartum phase, according to Thom et al. (17). For six months after giving birth, 27.4% of parous women may experience UI; only a small percentage of women get spontaneous remission.

The current study illustrated a statistically significant change in amount of urination during follow up among studied cases from first trimester to one month ($p<0.001$) and from first trimester to 3 months follow up ($p=0.002$).

The current study demonstrated a statistically significant high grade of bothering during follow up from first, second to third trimester, while statistically significant increase was detected after that for 48 h to one & three months.

Remarkably, the current study illustrated statistically significant positive correlation between age and frequency of urination at first trimester among studied cases ($r=0.348$, $p=0.04$) and statistically significant positive correlation between age and bothering in daily life at first trimester ($r= 0.366$, $p=0.03$).

The current study demonstrated statistically significant positive correlation between period of gestation and nocturnal urination at third trimester ($r=0.371$, $p=0.001$) and also at 48 h ($t=0.402$, $p=0.001$).

The current study demonstrated statistically significant positive correlation between age of the studied cases and burning during micturition at third trimester ($r=0.211$, $p=0.03$) and also at 48 h ($t=0.219$, $p=0.025$). But, period of gestation had statistically significant negative correlation with burning during micturition at first trimester ($r=-0.370$, $p=0.029$).

The current study showed statistically significant positive correlation between age

of the studied cases and urinary incontinence at first & third trimester (r=0.377, p=0.026 & r=0.196, p=0.046). But, period of gestation had statistically significant negative correlation with Urinary incontinence after 48 h (r=-0.207, p=0.034). However, the current study showed a non-statistically significant relation between urinary incontinence during follow up and age (in second trimester or at 48 hr or 1 or 3 month) and mode of delivery among studied cases (p>0.05).

Wang et al. (9) demonstrated, in line with our findings, that age at gestation was still a risk factor for postpartum SUI, based on seven studies involving 11,441 participants. The results suggested that older gestational ages would be associated with a higher risk for pregnant women. The findings on age at gestation were therefore trustworthy.

Also in similarity with our findings, Lima et al. (10) discovered no connection, either in the primiparous or multiparous groups, between urine incontinence and vaginal or caesarean deliveries and incontinence.

Additionally, Lima et al. (10) discovered that stress urine incontinence affected both primiparous and multiparous women, with a higher frequency of occurrence during the third trimester of gestation (period of gestation).

In Rajavuori et al. (11) study, the rate of cesarean sections was just 14%, and there were no appreciable variations in postpartum UI between the techniques of birth.

Cesarean delivery offers protection against UI, particularly prior to menopause, according to research on delivery modes. The pelvic floor's anatomical changes following vaginal delivery make a woman more vulnerable to UI. (18) This risk is significantly increased by instrumentally assisted vaginal delivery because of the additional pelvic floor injury from abrasions and mechanical stress. (19)

The current study demonstrated non statistically significant correlation between age, period of gestation, mode of delivery and amount of urination among the studied cases during follow up (p>0.05).

There are several reasons for the disparities in the results of the aforementioned research, such as variations in the duration of follow-up, diverse patient groups, patient selection, and small sample sizes.

CONCLUSION

Pregnant women who experience urine incontinence have a number of risk factors for this disease, including age, gestational age, birth mode, and urinary tract infection. The third trimester of pregnancy was when this symptom occurred most frequently.

It was feasible to draw the conclusion from the current study that there was no significant relationship between the occurrence of urine incontinence during pregnancy and parity or mode of delivery.

Therefore, more research is required to confirm this relationship on its own. Nonetheless, it is well recognized that avoiding or even lessening these symptoms toward the end of pregnancy and even after delivery requires a pelvic muscle strengthening program.

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