

Gestational Urinary Incontinence in Nulliparous Pregnancy- A Pilot Study

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ABSTRACT

Introduction: Urinary Incontinence (UI) in pregnancy is more than a disease; it is a social problem that necessitates special care and management. The exact rationales and biological facts behind urinary incontinence during pregnancy are unclear and multivariate.

Aim: This pilot study was designed to examine the direct effect of gestational factors (e.g., physical and metabolic/hormonal) on the presence of Gestational Urinary Incontinence (GUI), using nulliparous pregnant women as study subjects.

Materials and Methods: This was a questionnaire-based study comprising of 61 nulliparous pregnant woman who had not experienced any Urinary Incontinence (UI) before their pregnancies. Patients were examined during their pregnancies within the framework of the antenatal care program continued at the Division of Perinatology, Hacettepe University, Ankara, Turkey, between January 2015 and December 2016. A 'urinary incontinence questionnaire' was used three times during different periods of gestation (11–14, ~24 and ~37 gestational weeks)

for each patient. Statistical analyses was performed using the SPSS software version 20.0. The Chi-Square test or Fisher's-exact test was used to compare proportions in groups.

Results: The prevalence of total urinary incontinence (stress urinary incontinence, urge urinary incontinence and mixed urinary incontinence) in nulliparous pregnant women was 4.9% (n=3), 9.8% (n=6) and 26.2% (n=16) at 11–14, ~24 and ~37 gestational weeks, respectively. Stress urinary incontinence was found to be 3.3% (n=2), 6.6% (n=4) and 16.4% (n=10) at 11–14, ~24 and ~37 gestational weeks, respectively. Urge urinary incontinence frequency was found 1.6% (n=1), 3.3% (n=2), 6.6% (n=4), and mixed urinary incontinence frequency was 0% (n=0), 0% (n=0), 3.3% (n=2) at 11–14, ~24 and ~37 gestational weeks, respectively. Maternal age, birth weight of the neonate and gestational age at birth had no statistically significant effect on GUI.

Conclusion: Urinary incontinence is an important issue during pregnancy and related symptoms are more common in third trimester.

Keywords: Nulliparity, Stress, Urge

INTRODUCTION

UI in pregnancy is a social problem that necessitates special care and management [1]. The other important point is the variation in the description of UI by pregnant women in contrast to that of non-pregnant patients. Stress Urinary Incontinence (SUI) is the complaint of involuntary loss of urine on physical effort, especially together with sneezing or coughing [2]. This complaint in pregnant women is not only urinary loss on effort but also lower (sometimes upper) urinary system discomfort and a sense of change in terms of urination. The definitions of Urgency Urinary Incontinence (UUI) and/or Mixed Urinary Incontinence (MUI) are also problematic because of the interference of gestational factors [1].

The prevalence of SUI during pregnancy is approximately 40%, and it has been reported as 31% and 42% in nulliparous and multiparous women, respectively [1,3]. There are different publications from different societies/countries about the prevalence of UI during pregnancy, with some variations [4-8]. The incidence of urinary incontinence in pregnancy was found to be 26.3% among German population, and similarly 32% in Danish population [5,6]. However, the frequency was reported to be as high as 59% in a study which has been carried out in UK [4]. It has also been reported that the prevalence of UI increases with gestational age [9,10].

The exact rationales and biological facts behind SUI and UUI during pregnancy are unclear and multivariate; there are also society-based variations in the prevalence of UI in nulliparous and multiparous pregnant women. This pilot study was designed to examine the direct effect of gestational factors which are all related with continence mechanisms on the presence of GUI using nulliparous pregnant women as study subjects. Pregnancy has a considerable

influence on lower urinary tract. Urination frequency can differ due to physiological changes of the bladder at pregnancy. Frequency is defined as diurnal changes that may occur seven times or more of normal during the night and one or more changes during the day and night [1]. Uterine weight is the most important factor which is affecting frequency during pregnancy. The uterus weight does not only apply pressure to the bladder but also irritate it [2]. Other factors that may be affected are nervous and hormonal changes (influences in progesterone and relaxin levels). Pregnancy can also result in SUI (influences in tensile properties reduce the structural support of PFM, decrease in total collagen content can lead to joint looseness and stretching of pelvic ligaments) which is due to weakening of the pelvic floor [1].

MATERIALS AND METHODS

This questionnaire-based study comprised of 61 nulliparous pregnant women with no history of UI before pregnancy. All 61 patients were included in the study. This is a pilot study which contains nulliparous patients who came to our center at first trimester and continued her all pregnancy follow-ups at our center. The same obstetrician performed their pregnancy follow up during January 2015 to December 2016. Patients with systemic disorders, such as diabetes mellitus, obesity, hypertension and urinary system problems, were excluded from the study. Patients with history of previous pelvic floor surgery were also not included in this study. They were examined regularly during their pregnancies within the framework of the antenatal care program running at the Division of Perinatology, Hacettepe University, Ankara, Turkey. The Turkish version of Urogenital Distress Inventory (UDI-6) was used to

assess urinary symptoms [11]. We used this questionnaire three times during different periods of gestation (11–14, ~24 and ~37 gestational weeks). We queried 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. We also questioned change in urination style, complaints related to the urinary system, change related to the bladder. Change in urination style contains, urination more frequently than before pregnancy, discontinuous urination, difficult urination, straining for urination. Complaints related to the urinary system are pain and burnout which can explain with urinary system infection. Changes related to the bladder can explain the feeling of fullness in the bladder, feeling discharge in the bladder.

The results of the reliability and validity study showed that Turkish version of Urogenital Distress Inventory had psychometrically strong score for assessing symptom severity (Chronbach's alpha 0.74) [11].

We used the definitions of the International Continence Society to describe the symptoms and signs [12]. According to this definitions; SUI is the complaint of involuntary leakage on effort or exertion, or on sneezing or coughing, UUI is the complaint of involuntary leakage accompanied by or immediately preceded by urgency and MUI is the complaint of involuntary leakage associated with urgency and, also with exertion, effort, sneezing or coughing.

The study protocol was approved by the Hacettepe University Non-interventional Clinical Researches Ethics Board (approval no: GO 16/101-30). Informed consent was obtained from all participants according to the principles stated in the Declaration of Helsinki and they were informed about the study protocol.

STATISTICAL ANALYSIS

Statistical analysis was performed using the SPSS software version 20.0. The Chi-square test or Fisher's-exact test (when Chi-Square test assumptions do not hold due to low expected cell counts), where appropriate, was used to compare proportions in groups. A p-value of less than 0.05 was considered to show a statistically significant result. Relationship between GUI and maternal age, birth weight of the neonate, gestational age at birth were analysed with logistic regression analyses (CIF with 95% confidence interval, $p < 0.05$)

RESULTS

[Table/Fig-1] shows the data related to maternal age, gestational week(s) at delivery and birth weight of neonates. In our questionnaire-based pilot study, we demonstrated that the prevalence of total UI

Variables	Mean(SD)	Min-Max
Maternal age (year)	27.29 (3.73)	19-35
Gestational week	38.35 (1.90)	32-41
Birth weight of neonates (grams)	3.017(568.95)	1330-4010

[Table/Fig-1]: Demographic characteristics of participants.

Symptoms of urinary incontinence	11-14 th gestational week n(%)	24 th gestational week n(%)	37 th gestational week n(%)
SUI	2 (3.3)	4 (6.6)	10 (16.4)
UUI	1 (1.6)	2 (3.3)	4 (6.6)
MUI	-	-	2 (3.3)
Total urinary incontinence (%)	3 (4.9%)	6 (9.9%)	16 (26.3%)
Change in urination style	22 (36.1)	35 (57.4)	45 (73.8)
Any complaints related to urinary system	17 (27.9)	31 (50.8)	43 (70.5)
Change related to bladder	15 (24.6)	33 (54.1)	44 (72.1)

[Table/Fig-2]: Symptoms of urinary incontinence during pregnancy (n=61).

SUI; Stress urinary incontinence, UUI; Urgency urinary incontinence, MUI; Mixed urinary incontinence

(SUI, UUI and MUI) in nulliparous pregnancies was 4.9% (n=3), 9.9% (n=6) and 26.3% (n=16) at 11–14, ~24 and ~37 gestational weeks, respectively. SUI was found to be 3.3% (n=2), 6.6% (n=4) and 16.4% (n=10) at 11–14, ~24 and ~37 gestational weeks, respectively [Table/Fig-2]. Urge urinary incontinence frequency was found 1.6% (n=1), 3.3% (n=2), 6.6% (n=4), and mixed urinary incontinence frequency was 0% (n=0), 0% (n=0), 3.3% (n=2) at 11–14, ~24 and ~37 gestational weeks, respectively. Increasing frequency was demonstrated in all types of urinary incontinence during the course of pregnancy. In our study, 36 women never had urinary incontinence (SUI, UUI or MUI) at any time during pregnancy (36/61, 59%). Changes related to the bladder (feeling of fullness in the bladder, feeling discharge in the bladder) were observed 24.6%, 54.1%, 72.1 at first, second and third trimester respectively.

Maternal age, birth weight of the neonate and gestational age at birth had no statistically significant effect on gestational urinary incontinence.

DISCUSSION

Foetal growth and enlargement of utero-placental structures together with endocrinological/metabolic gestational changes may lead to impaired 'urinary bladder-neck' and pelvic floor interaction, and these complex relationships may be the reason for GUI [13-15]. On the other hand, the occurrence of SUI and/or UUI is a more complex medical complaint, especially during pregnancy [2,14,15]. It is not only the mechanical factors and trauma (including previous birth(s) and surgery) but also hormonal (changes in progesterone and relaxin levels), metabolic and genetic factors that are the aetiological rationales behind these urinary complaints [15-19].

Hence, it is important to know the prevalence of GUI during different periods of pregnancy. The prevalence of SUI is reported to be approximately 41% (18.6%–60%), increasing with gestational age (gestational weeks) [1,3,6-8]. In our questionnaire-based pilot study, we have demonstrated that the prevalence of total UI (SUI, UUI and MUI) in nulliparous pregnancies is 4.9%, 9.8% and 26.2% at 11–14, ~24 and ~37 gestational weeks, respectively. SUI (3.3%, 6.6% and 16.4% at 11–14, ~24 and ~37 gestational weeks, respectively) was found to be the main type of UI, as reported previously [4,10]

The goal of this pilot study was to demonstrate the direct effect of expansion of the uterus and foetal growth (together with hormonal, collagen and metabolic changes in pregnancy) on the 'pelvic floor and genital system –urinary system interaction' using a very specific group of pregnant women (those in their first pregnancies) [1,3]. In our study we couldn't demonstrate any relationship between GUI and either the birth weight of the neonate or maternal age. Some genetic/epigenetic factors seem to be important in the appearance of gestation-based pelvic problems [20].

Previous studies on urinary incontinence have been carried out in different communities in the past, some of which include only nulliparous [1,21-24], but there is no study in this area that previously covered only nulliparous in Turkey. From this point of view, we think that this pilot study can be a pioneer.

In this pilot study, we have noticed that UI complaints accompany some other types of atypical or poorly defined 'pelvic floor' and urinary 'symptoms/complaints', and these unclear situations necessitate a pregnancy-specific approach to UI problems. We believe that better tested questionnaires and well-designed prospective basic science studies are necessary for proper management of gestational GUI and its subtypes (SUI, UUI and MUI).

LIMITATION

The number of patients enrolled in the study was limited. The study participants were selected from only one department and this is a little far from to represent all population. Multicentre based and

well designed studies are necessary to clarify the pregnancy related urinary system problems.

CONCLUSION

In conclusion, urinary incontinence is an important issue during pregnancy and related symptoms are more common in third trimester.

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