

**ORIGINAL
ARTICLE**

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Received: 21.01.2018

Acceptance: 18.06.2018

DOI: 10.18521/kt.399972

Konuralp Medical Journal
 e-ISSN1309-3878
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Impacts of Childbirth on the Subsequent Risk of Stress Urinary Incontinence

ABSTRACT

Objective: The purpose of the this study was to indicate the role of childbirth parameters on the development of stress urinary incontinence (SUI).

Methods: One hundred-one healthy women (control group) and 98 patients with SUI (study group) were included in this study between March 2008 and April 2009. Obstetric history of participants was taken and labor parameters were compared between control group and study group.

Results: The prevalence of SUI reported in the study was 43.9%. The result of prevalence was 43.9% during the study. Parity and gravidity was significantly more in study group ($p<0.001$). Vaginal delivery, Kristeller manauver, operative delivery by vacuum or forceps extraction and delivery of macrosomic fetus was found to be significant risk factors for SUI ($p<0.05$).

Conclusions: Mode of delivery and obstetric history have significant impact on subsequent SUI. Timely cesarean section in women with obstructed labor may prevent the later occurrence of SUI.

Keywords: Stress Urinary Incontinence, Pelvic Floor, Labor, Obstetric, Risk Factors

Doğum Sonrası Gelişen Stress Üriner İnkontinans Riski Üzerine Doğum Eyleminin Etkileri

ÖZET

Amaç: Bu çalışmanın amacı, stres üriner inkontinans (SÜİ) gelişiminde doğum parametrelerinin rolünü araştırmaktır.

Gereç ve Yöntem: Çalışmamıza polikliniğimize Mart 2008 ile Nisan 2009 tarihleri arasında başvurmuş 101 sağlıklı kadın (kontrol grubu), 98 stres üriner inkontinansı olan kadın (çalışma grubu) dahil edilmiştir. Katılımcıların obstetrik hikayeleri alındı ve grupların doğum parametreleri karşılaştırıldı.

Bulgular: Çalışmamızda stres üriner inkontinans prevalansı %43.9 oranında saptanmıştır. Gebelik ve doğum sayıları çalışma grubunda anlamlı olarak daha yüksekti ($p<0,001$). Vaginal doğum, Kristeller manevrası, forseps ve vakum kullanılan operatif doğumlar ve makrozomik fetus öyküsü stres üriner inkontinans için anlamlı risk faktörleri olarak belirlenmiştir ($p<0,005$).

Sonuç: Doğum şekli ve obstetrik hikaye stres üriner inkontinans üzerinde anlamlı etkiye sahiptir. Planlı sezaryen doğum ise stres üriner inkontinans gelişimini önleyebilir.

Anahtar Kelimeler: Stres Üriner İnkontinans, Pelvik Taban, Doğum, Obstetrik, Risk Faktörleri

INTRODUCTION

The unintentional leakage of urine on activity, stress urinary incontinence is estimated to affects about 4% to 30% of women on average and the prevalence of stress urinary incontinence peaks at around the age of 55 years [1-3]. Nowadays, there is hectic investigation in defining risk factors for SUI and other types of urinary leakages as a result of the fact that SUI have considerable impact on quality of life [4-8]. Aging, obesity, smoking, childbirth, and pregnancy have been reported as principle risk factors for developing SUI in women [6,9]. Conclusions regarding pregnancy and the way of birth associated with urinary incontinence are inconsistent. Actually, this is because it cannot be explained by the pelvic floor mechanism entirely. The evidence underlying the hypothesis that casual relationship with vaginal delivery and SUI is mechanically supported by basic science and its logical. [10]. On the other hand, although numerous epidemiologic studies show a medium to serious increase in the relative risk of pelvic floor disorders in multiparous versus nulliparous women, other studies suggest that there is little to none increased in risk value. [11-14].

Based on this information, in this retrospective clinical study, we targeted to research the effects of childbirth parameters on the subsequent stress urinary incontinence in a tertiary clinical setting.

MATERIAL AND METHODS

A total of 223 women who applied to the gynecology out-patient clinic of Okmeydani Training and Research Hospital, Department of Obstetrics and Gynecology, Istanbul, Turkey between March 2008 and April 2009 were included in the sample pool.

Patients were selected indiscriminately by computer method. Twenty-four women were discarded from the study. The reasons are previous incontinence surgery (n=5), preexisting type II diabetes mellitus (n=7), being older than 65 years (n=7). Based on some pathologic conditions such as previous incontinence surgery (n=5), preexisting type II diabetes mellitus (n=7), being older than 65 year (n=7) twenty-four women were discarded from the study. Five patients refused to join in the study. Five women rejected attend to study among the patients. As a consequence, number of the final specimen included 199 patients. The local ethical committee of the institution affirmed study protocol.

History and physical examination is significant for diagnosis of SUI. A woman was thought to have stress incontinence if there was an affirmative reply to the question "Do you have episodes of involuntary leakage on efforts or on sneezing or coughing?" and positive cough test during gynecological evaluation. After the examinations, subjects are divided into two groups; first group (n=98) included SUI patients, healthy women which is without SUI assigned in control group (Group 2, n=101)

Obstetric and demographic history of participants of age, gravidity, parity, mode of delivery, delivery of macrosomic fetus which was defined as newborn weight greater than 4500g, episiotomy, and vacuum extraction or forceps delivery were taken.

Participants out of 35-65 year of ages, history of chronic medical comorbidities, presence of morbid obesity (BMI>30) and women that have a medical history of surgery for urogynecologic problems were excluded from the trial.

Statistical analysis:

Statistical analyses about this study were done using a statistical software (SPSS version 13.0, SPSS, Chicago, IL, USA). The values were defined as mean \pm standard deviation (SD) whenever its necessary. Normality for variables in the study groups was defined by the Kolmogorov-Smirnov test. To detect of normality for variables in groups be used Kolmogorov-Smirnov test. In the comparison of the two groups, the Mann-Whitney U test was done for the variables that did not showed a normal distribution pattern. On the contrary, variables had a normal distribution pattern. To compare the groups, an independent sample t- test be used. Chi-square test was used to compare the categorical variables. A value of $p < 0.005$ was thought statistically important. (*).

RESULTS

A total of 223 women were accepted to our out-patient gynecology clinic during the research which was included in 98 patients with SUI. Based on this situation, prevalence of SUI was found 43.9% in our research population. Therefore, SUI prevalence was found to be 43.9% in our study population. Demographic features of both study groups were similar between the groups except the parity and gravity were seriously higher in Group 1 ($p < 0.001$) (Table 1).

Table 1. The comparison of demographic properties of groups

Groups	Group 1 (n=98)	Group 2 (n=101)	P
Age (mean \pm SD)	47.6 \pm 7.0	45.0 \pm 6.6	0.326
Gravidity-med (min-max)	5 (1-14)	4 (1-8)	<0.001
Parity-med (min-max)	4 (1-12)	3 (1-6)	<0.001
BMI-med (min-max)	28 (23-34)	26 (24-37)	0.635
Menopause (n, %)	45 (45.9)	42 (41.5)	0.111

Labor parameters of groups were presented in Table 2. Labor parameters of groups were existed in Table 2. Cesarean group made completely caesarean delivery, the normal birth group had made a completely normal delivery. There are two groups of delivery in women, completely Cesarean or completely normal birth. Among women who has SUI, 88.8 % of cases

(n=70) born vaginally, whereas 73.2% of control subjects had a history of vaginal delivery (n=74) ($p<0.005$). Besides, history of Kristeller maneuver during the vaginal delivery, vacuum extraction and using forceps are as against significantly more common in Group1 ($p<0.005$). History of episiotomy was found similar between the groups thus there was no significance in p value.

Table 2. The comparison of obstetric history of groups

Groups	Group 1 (n=98)	Group 2 (n=101)	p
Cesarean delivery (n,%)	11 (11.2)	25 (24.8)	0.016
Kristeller maneuver (n,%)	69 (73.4)	47 (47.5)	<0.001
Episiotomy (n,%)	55 (59.8)	63 (64.3)	0.474
Vacuum extraction (n,%)	10 (10.2)	2 (2)	0.015
Forceps delivery (n,%)	7 (7.1)	0	<0.001
Delivery of macrosomic fetus (n,%)	26 (27.7)	5 (5.3)	<0.001

DISCUSSION

The main findings of our study showed that obstetric history including parity, vaginal birth, operative birth, and delivery of macrosomic fetus has a serious impact on subsequent SUI in women. Urinary incontinence is a very serious health problem in the world which causes to embarrassment, shortness of social, daily and sexual activities and is a important economic problem on the patient as well as healthcare system [2-4].

The studies, especially after childbirth, have shown that the prevalence of SUI is lower after caesarean delivery. We also found that caesarean section can be protective against SUI in our study. The survey of a study analyzed the association between mode of delivery (caesarean section only versus normal birth only) and prevalence of SUI (mixed or pure) according to age group [15]. SUI prevalence was increased for those aged 30-39 years old who delivered by normally (19%) compared to those delivered by caesarean section (OR=2.1) but the difference was not important for those 50-64 years old (27% versus 20%) or aged 40-49 years old (24% versus 18%) [15]. In a study contains with 48 years old 1333 women, SUI prevalence was slightly increased for women with only normal deliveries compared with women delivered only by caesarean (52% versus 44%) but still the difference was not important [16]. The negative effects of childbearing and vaginal delivery on normal bladder physiology may explain by the pelvic floor dysfunction during delivery process because of muscular damage, nerve damage, and tissue stretching and disruption. Supporting this hypothesis, several authors reported that emergency cesarean operation may not decrease the risk of urinary continence. Respectively, a year after a first delivery Groutz et al. found that a prevalence of stress urinary incontinence was only 3% after elective caesarean section. Unfortunately these numbers are in the

after caesarean during labor group by 12% and in the after vaginal delivery group by 10%. Caesarean section during labor appears to have risk of nerve injury and elective caesarean operation does not. Therefore, it may be postulated that pregnant women in a prolonged or obstructed labor should undergo a timely caesarean delivery to avoid subsequent SUI. On the other hand, prophylactic role of elective caesarean operation to avoid the pelvic floor disorders has not been proven in the relevant literature [18].

The presented study has limitations. Major limitations of this study include the fact that surveyed patient numbers were small, and that the results were not obtained from multiple institution. Another limitation of our study was the details of obstetrical history of participants were collected retrospectively. Analysis of electronic medical records from a national birth registry which is not available in our setup, would enhance more clear association between the obstetrical career and SUI, since memory bias about obstetric variables such as Kristeller maneuver is unavoidable.

As a conclusion that SUI is significantly related with obstetrical and childbirth parameters and vaginal birth, operative birth, and delivery of macrosomic fetus has a significant impact on subsequent SUI in women. In a conclusion, SUI is considerably related with obstetrical and childbirth parameters and vaginal birth, operative birth, and delivery of macrosomic fetus. All of these reasons have an important effect on occurring SUI in women.

Acknowledgments: None

Consent: The study was approved by the local ethical committee of the hospital.

Conflict of Interest: The authors declare that they don't have a conflict of interest. We clarify that we had no association with companies that may have a financial interest.

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