

# Potential risk factors associated with stress urinary incontinence among Iranian women

Babak Vahdatpour, Mahtab Zargham<sup>1</sup>, Maryam Chatraei, Faranak Bahrami<sup>1</sup>, Farshid Alizadeh<sup>1</sup>

Departments of Physical Medicine and Rehabilitation and <sup>1</sup>Urology, Kidney Transplantation Research Center, Isfahan University of Medical Sciences, Isfahan, Iran

## Abstract

**Background:** Stress urinary incontinence (SUI) is considered as one of the major hygienic problems among women. The main aim of the study is to assess the potential risk factors associated with SUI among Iranian women.

**Materials and Methods:** This study was conducted on 90 married women with history of SUI diagnosed by an urologist and were selected randomly. Their pelvic muscles contraction (PMC) and the history of the subjects were assessed for some of risk factors such as age, height, weight, body mass index (BMI), pregnancy history, miscarriage, type of delivery (normal vaginal delivery or cesarean section), number of offspring born healthy in addition to other risk factors such as chronic cough, constipation and hypothyroidism by use of POP Questionnaire. Data were analyzed using Pearson correlation coefficient and SPSS version 18 Software.

**Results:** There was a significant relation between SUI and height ( $P < 0.05$ ,  $r = 0.45$ ), vaginal delivery (NVD) ( $P < 0.05$ ,  $r = 0.2$ ), number of genitourinary surgery ( $P < 0.05$ ,  $r = 0.42$ ), hypothyroidism and constipation ( $P < 0.05$ ). An inverse relatively strong significant relation was found between SUI and cesarean section ( $P < 0.05$ ,  $r = -0.50$ ) No significant relation was found between SUI and weight, BMI, age, chronic cough and miscarriage, and other study parameters. An inverse significant relation between PMC and weight ( $P < 0.05$ ,  $r = -0.52$ ), BMI ( $P < 0.05$ ,  $r = -0.42$ ) and number of genitourinary surgery ( $P < 0.05$ ,  $r = -0.18$ ).

**Conclusion:** Cesarean section had a preventive effect on SUI versus normal vaginal delivery. The rate of SUI was higher in taller women or those suffering from hypothyroidism or constipation or who had genitourinary surgery. The women with high BMI had lower pelvic floor muscles strength.

**Key Words:** Biofeedback, risk factors, stress urinary incontinence

### Address for correspondence:

Dr. Mahtab Zargham, Department of Urology, Kidney Transplantation Research Center, Isfahan University of Medical Sciences, Al-Zahra Hospital, Soffeh Blvd., Isfahan, Iran. E-mail: mah\_zargham@yahoo.com

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## INTRODUCTION

Urinary incontinence is the unintentional passing of urine. It may not be so weighty in some situations and in

slight volume, but it may result in disappointment and anxiety particularly among women. Since the disorder is more common among females compared to males due to the distinctions of their body structure and specifically

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pregnancy issue, there has been specific attention given to this disease among females. As some various changes occur after labor, the women are more susceptible to disease due to the decrease in their pelvic floor muscles contractions.<sup>[1-3]</sup> It has been confirmed that 10% to 30% of women of age group 15-46 years and 50% of patients in care centers suffer from urinary incontinence<sup>[4]</sup>, with the number increasing with advancing age. As a result, we observe that 30% to 50% of women over 65 years complain of this disorder.<sup>[5]</sup> Various factors are involved in SUI occurrence, such as decrease pelvic floor muscles contractions, heavy exercises and physical activities, aging, menopause, number of deliveries, type of labor, increase weight, constipation, chronic coughs and many more factors.<sup>[6,7]</sup> The risk of developing SUI among obese women with a body mass index of 30 or more (MBI  $\geq 30$ ) regardless of age and number of deliveries is twice compared to underweight women.<sup>[8]</sup> Thirty four percent of people diagnosed with SUI suffer from mental and social disorders such as depression, insomnia and other related problems. These factors negatively affect their social and sexual life.<sup>[9]</sup> Therefore, due to the substantial importance of these problems, it is vital to identify potential risk factors on developing the disorder with the intention of preventing them or at least lower their effects. Hence, the aim of the research is to assess and evaluate relation of potential risk factors and SUI among Iranian women.

## MATERIALS AND METHODS

This is a cross-sectional study, which was carried out from November 2012 to May 2013 among the married women who had more than 18 years of age that were referred to Urology Clinics of affiliated hospitals of Isfahan Medical Sciences, Iran, and were diagnosed with SUI by use of clinical examination (Marshall Test and Positive Cough Test), Pad Test (the weight gain of more than 8 g/24 h has been considered to be significant) and if the previous test results were not reliable, urodynamic tests was done for the cases. Among them, 90 women were selected by simple random sampling and by biofeedback device using a computer and electronic instruments to let an individual know when the pelvic muscles are contracting. The pelvic floor muscles strength were measured through the vaginal probes, which were specified for each patients. POP Questionnaire was completed for each patient consisting of information such as age, height, weight, body mass index (BMI), history of pregnancy and delivery (number of conceptions, number of offspring delivered healthy, number of miscarriage, genitourinary surgery, and other potential risk factors such as smoking cigarette, hypothyroidism, chronic cough and constipation. Collected data were recorded and analyzed using SPSS 18 Software and relevant

statistical tests, such as Pearson correlation coefficient, were applied to assess the relationship between these factors and SUI. A  $P < 0.05$  was considered as significant level in these statistical methods.

## RESULTS

The total number of patients in this study was 90 individuals, aging 43 to 53 years (mean: 48 years). The range of the sample height was 156-167 cm (mean: 162 cm). The range of our subjects' weight was 60.4-79 kg (mean: 69.9 Kg). Average BMI was  $26.7 \pm 3.5$ . Given the results in Table 1, we evaluate the relation between risk factors and SUI and PMC.

Pearson correlation coefficient revealed a direct significant relation between SUI and height ( $P < 0.05$ ,  $r = 0.45$ ), vaginal delivery (NVD) ( $P < 0.05$ ,  $r = 0.2$ ), number of genitourinary surgery ( $P < 0.05$ ,  $r = 0.42$ ), hypothyroidism and constipation ( $P < 0.05$ ). On the other hand, an inverse relatively strong significant relation was found between SUI and cesarean section ( $P < 0.05$ ,  $r = -0.50$ ). That is, as the number of cesarean section increases, likelihood of developing SUI decreases. In addition, No significant relation was found between SUI and weight, BMI, age, chronic cough and miscarriage, and other study parameters. Also, this correlation demonstrated an inverse significant relation between PMC and weight ( $P < 0.05$ ,  $r = -0.52$ ), BMI ( $P < 0.05$ ,  $r = -0.42$ ) and number of genitourinary surgery ( $P < 0.05$ ,  $r = -0.18$ ).

## DISCUSSION

The study provides evidences that there is a direct and significant relation between height and rate of urine leakage. However, it has not been proven that there is a relationship between height and having bigger pelvic bone but it seems, taller women have pelvic bone with higher diameter. Increase of pelvic bone diameter results on higher consistency between anatomic position

**Table 1: Pearson correlation coefficient for pelvic floor contractions and SUI with some risk factors**

Variable	SUI		Pelvic floor muscles contractions	
	<i>r</i>	<i>P</i>	<i>r</i>	<i>P</i>
Age	0.02	0.85	0.19	0.07
Height	0.45	<0.001	-0.13	0.21
Weight	-0.005	0.98	-0.52	<0.001
BMI	-0.17	0.09	-0.42	<0.001
Number of deliveries	-0.03	0.80	0.01	0.90
Miscarriage	-0.02	0.84	0.09	0.38
NVD	0.19	0.035	-0.02	0.84
CS	-0.5	<0.001	0.07	0.47
Surgery	0.42	<0.001	-0.18	0.04

SUI: Stress urinary incontinence, NVD: Vaginal delivery, CS: Cesarean section, BMI: Body mass index

of pelvic internal organs and pelvic floor muscles and levator ani muscle. So with aging and increasing number of delivery, taller women with wider pelvic bone are more prone to develop prolapse and weakening of pelvic floor muscles and consequently the possibility for urinary incontinence and increase severity of the complications.<sup>[10-13]</sup> There was an direct relation between NVD and SUI and also inverse relation between urine leakage and number of cesarean section among sample patients, and because actually, NVD considers an actual factor in causing prolapse of pelvic floor muscles and increasing SUI development, cesarean section which considers a replacement to NVD and there has been a tendency toward cesarean section selectively for first pregnancy or consecutive pregnancies in hope to prevent or decrease urinary incontinence and involuntary stool elimination, vaginal prolapse or hemorrhoids.<sup>[14-17]</sup> Other obtained result from this study was the inverse relation between pelvic floor muscle contractions and BMI among patients. Other study has also shown a significant relation between urinary incontinence and BMI increase that affect the quality of life of patients negatively, and obese women and those women that do not exercise regularly are more susceptible to urinary incontinence.<sup>[18-20]</sup> In fact, it is expected a decrease on pelvic floor muscles contractions with BMI increase, which was agreed by our study too, and consequently more potential risk for urine leakage. However, the result was not fruitful in this second part of study as no significant relation was found between BMI and urine leakage and a need for in depth study was felt.<sup>[11,21]</sup> In this research population, we had found 16% for incidence of hypothyroidism; in comparison with general women population (about 10%)<sup>[22]</sup> direct significant relationship between hypothyroidism and the SUI had been demonstrated. So according to the previous studies there is a definite relation between thyroid and voiding dysfunction.<sup>[23]</sup>

Complications in pelvic floor muscles function affect women with various ages and have a wide range of signs and symptoms that is rarely separable and some predisposing factors include pregnancy, birth trauma, increase age, hysterectomy and lifestyle.<sup>[18,24]</sup> Therefore, it is fundamental to provide some guidance in educational programs for women health benefit.

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### Conflicts of interest

There are no conflicts of interest.

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