

Stain in Life: Predisposing Risk Factors and Prophylaxis of Urinary Incontinence in Women

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Abstract

Urinary incontinence (UI) in women has detrimental effects on quality of life including physical, psychological and social well-being. A lot of studies have been done and data is available to diagnose and manage urinary incontinence, however, there is still limited quality information on predisposing factors and clinical practice guidelines on prophylaxis of urinary incontinence. This review article is designed to highlight predisposing factors and prophylactic measures taken to avoid urinary incontinence in women. The predominant predisposing factors of urinary incontinence are age, BMI, parity, pregnancy, perineal damage during childbirth, genetic predisposition, diabetes, constipation, smoking, alcohol consumption, intake of carbonated drinks, asthma and other respiratory disorders. The most effective methods of preventing urinary incontinence are counseling and support for weight reduction, counseling to reduce the number of children, appropriate labor management, lifestyle interventions and supervised pelvic floor muscle training (specifically Kegel exercises). Health care providers can play their role by providing education and counseling to those women who are at risk of developing this prevalent and distressing condition.

Key words: Evidence-based review, Urinary incontinence, risk factors, prevention, Kegel exercises.

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Introduction

Normal continence in women is a complex coordination and proper function of bladder, urethra and pelvic musculature along with surrounding connective tissues. Urinary incontinence is a disabling, distressing and costly condition impacting many adults but it is more frequent in women. The term "urinary incontinence" (UI) is defined by international continence society (ICS) as "involuntary loss of urine which is objectively demonstrable and is a social and hygienic problem".¹ Urinary incontinence in women has several different types but the most common are stress, urge and mixed.

Stress urinary incontinence (SUI), the most prevalent form, is defined as involuntary loss of urine on physical exertion like coughing, sneezing, walking, weight lifting or any other activity which causes a sudden rise in intra-abdominal pressure. Its pathophysiology involves increased bladder pressure which exceeds urethral closure pressure causing urethral sphincter opening and transient urine loss.^{1,2}

Urge urinary incontinence (UUI) is involuntary urine leakage accompanied or preceded by urgency. During filling phase of the bladder, the bladder contracts abnormally, causing increased desire to urinate, which is very difficult to control and results in spontaneous urine leakage.^{1,3}

Mixed urinary incontinence (MUI) is a complaint of involuntary urine leakage with both urgency and physical exertion. Its pathophysiology involves factors such as striated muscle atrophy, women's estrogen status and ultrastructural changes which are now under study.^{1,4}

The prevalence of urinary incontinence varies widely for a variety of reasons (such as the difference in study populations). UI affects approximately 20 million people in the United States with the prevalence of 26–46%. The annual direct cost of urinary incontinence care in the US was estimated to be \$16.3 billion, which includes 76% for women. Cost for women over 65 years of age was approximately double the cost for those under 65 years (\$7.6 and \$3.6 billion,

respectively).⁵ Studies in USA and UK highlighted that the direct cost associated with UI care is more than other common chronic illnesses such as coronary care and cancer care.⁶

In Pakistan, according to Jamil A et al, prevalence rates of UI are 45% in pregnant women⁷ and Ali HS et al found UI affects 10.6% of postpartum women.⁸ One study showed frequency of urinary incontinence to be 44.4% amongst all women attending gynaecology clinic at Agha Khan University.

Urinary incontinence has a substantive and detrimental impact on quality of life.¹⁰ Mascarenhas et al reported negative affects of UI on social and sexual relationships.¹¹ Although urinary incontinence does not increase mortality but it does cause local candidal infection, pressure sores, constant skin irritation, cellulitis and sleep deprivation due to nocturia in some patients. Psychological consequences include low self-esteem, social withdrawal, depressive illness, sexual problems and curtailed social and recreational activities.¹² It also increases the risk of nursing home admissions, especially of older women with this problem.¹³

In 1991, just to emphasize the importance of genital tract support for normal continence, de Lancey proposed supracervical hysterectomy instead of total abdominal hysterectomy whenever possible.¹⁴ However, recent data (2015) showed no difference in urinary incontinence between both study groups.¹⁵

Problem statement and purpose

This review article is designed to expose the gynecologists to predisposing risk factors of urinary incontinence and possibly their preventive roles that if played properly can prevent the women from this distressing condition. The following research questions were developed:

1. What are the predominant predisposing factors of urinary incontinence in women?
2. Can urinary incontinence be prevented in women?
3. Are pelvic floor muscle exercises (PFMEs) beneficial in the prevention of urinary incontinence?
4. Who should train the women for PFMEs?

What are the predominant predisposing factors of urinary incontinence?

1. Age:

Minassian VA et al reported increased prevalence of UI with increasing age.¹⁶ A survey done by Dallosso HM et al on 6424 women revealed increased prevalence of UUI with age but no significant change in SUI.¹⁷ Zhu L

et al reported the prevalence of MUI increased with aging, that of SUI peaked in a group of women aged 50 years and that of UUI in a group of women aged 70 years.¹⁸ A study conducted on Indian population showed that prevalence of incontinence increased with advancing age from 10.8% in 20-29 years age group to 46.7% in age group of 70 years or more.¹⁹ Similarly, a study conducted on Turkish women showed higher prevalence of UI in women age 65 or older.²⁰

2. Body Mass Index (BMI)

Minassian VA et al found increased BMI a significant risk factor in all types of UI.¹⁶ A prospective cohort study done on 7046 women by Dallosso HM reported significantly increased risks of SUI and UUI with obesity.¹⁷ The estimated probability of developing UI in women with a body mass index of 30 or more was 0.41 for Caucasians, 0.50 for African Americans, 0.39 for Chinese, 0.31 for Japanese, and 0.30 for Hispanics, while for a normal body mass index of 19–24.9, it was 0.33 for Caucasians, 0.42 for African Americans, 0.31 for Chinese, 0.24 for Japanese, and 0.23 for Hispanics.²¹ Zhu et al found central obesity (women's waist circumference, ≥ 80 cm) a potential risk factor for SUI.¹⁸ 52% women reported UI in a survey conducted on community dwelling adult women with BMI more than normal limits.²² Phelan S et al reported each 1 kg of weight lost was associated with significant reduction in risk of developing UI.²³

3. Parity

Hansen et al. reported that urinary incontinence was 3X more common in primiparous women compared with their age-matched nulliparous counterparts.²⁴ Similarly, Kepenekci et al. found increased risk of urinary incontinence with increasing parity.²⁵ Several studies have shown a strong association of parity and moderate to severe UI.^{16,18-22,26-28}

4. Pregnancy:

Several studies support that the pregnancy itself is strongly associated with UI. Wesnes et al presented questionnaire data from Cohort Study and found that the most common type of UI in pregnancy was SUI in both nulliparas (31%) and multipara (42%) respectively.²⁹ Sangsawang B et al summarized prevalence studies of UI and found high prevalence of UI amongst pregnant population of Norway (SUI 31% in nulliparous and 42% in parous women), UK (SUI 59%), Germany (UI 26.3%), China (SUI 18.6%, MUI 4.3%, UUI 2.0% in late pregnancy), Taiwan (SUI 26.7%, MUI 6.1%, UUI 4.7%), USA (UI 70% in nulliparous, 75% in multiparous women, SUI 32%) and Australia (SUI 36.9%, MUI 13.1%, UUI 5.9%).³⁰ Victoria et al reported

prevalence of SUI to be 14% amongst vaginally delivered and 2.5% in cesarean section group after 5 years from delivery and odds of urinary symptoms increased each year since first delivery.³¹

The pressure of enlarged uterus and fetal weight on pelvic floor muscles (PFM) along with hormonal changes associated with pregnancy, may lead to reduced strength of PFM and their important supportive and sphincteric function.³⁰

5. Mode of delivery

According to World health organization (WHO), One-third of women suffer from UI after delivery. A longitudinal cohort study done on 305 primiparae showed that episiotomy and Vacuum extraction was significantly associated with the onset of SUI.³² Several studies have reported significant correlations among UI and vaginal deliveries especially operative vaginal deliveries.^{18,33,34,35,36}

According to Gyhagen M, the risk of UI was around 70% greater after vaginal delivery than after cesarean section but regarding association of vaginal birth and UI, 8 or 9 caesarean sections need to be performed to avoid only one case of urinary incontinence.³⁶

6. Lifestyle factors:

Singh Uma reported that the habit of taking excessive tea, tobacco, pan or betel are associated with increased prevalence of urinary incontinence.²⁸ Alcohol consumption is also a known risk factor for UI.¹⁸ Dallosso HM highlighted smoking and excessive intake of carbonated drinks as important risk factors for the development of SUI.¹⁷

Others

Literature review by Legendre G et al showed that the UI is a common symptom during menopause, with a prevalence of up to 30% and an annual incidence of up to 10% but the association between UI and menopause is controversial.³⁷ Seshan V et al reported weight of the largest baby ever delivered is positively associated with UI.²² Lince SL et al investigated that genetic predisposition is also an important factor in the development of UI.³⁸ Diabetes, Asthma, respiratory disorders, and constipation have been recognized as risk factors for UI.^{18,20,21,28,39} A survey conducted on women with uteri and without uteri showed a higher incidence of UUI and SUI episodes in those participants who had undergone hysterectomy. Randomized clinical trials of subtotal versus total abdominal hysterectomy showed no significant difference regarding the development of UI in both groups.^{15,41}

Can urinary incontinence be prevented in women?

1. Weight reduction

For women who are overweight, weight loss is significantly associated with a reduction in UI. Phelan S found that every one percent reduction in BMI over the 6-year follow-up of 1778 women was associated with an approximate one-quarter reduction in UI.²³ Similarly Vissers D et al⁴², Wein AJ⁴³ and Subak LL⁴⁴ et al mentioned in their studies that counseling and supporting for weight loss was strongly and independently associated with prevention of UI.

1. Reducing number of children

Several studies have mentioned that increasing parity is the strongest predictor of urinary incontinence later in life. So providing educational care regarding reducing number of children is associated with decreased risk of urinary incontinence and other pelvic floor problems.^{18,20,22,24,26,28}

2. Appropriate labor management

Kissler K et al reported a case study of prenatal and intrapartum interventions which described that by preventing urethral injury and pelvic floor muscle damage during vaginal delivery can prevent urinary incontinence.⁴⁵ Saadia Z reported results of a cross-sectional study done on 633 women and found that by avoiding perineal trauma and denervation during vaginal and instrumental deliveries can protect women from UI.⁴⁶

Several studies found a protective effect of cesarean section^{36,47} while others didn't³⁵, but due to increasing demand of elective cesarean section there is a need to do further research to answer whether or not elective cesarean section can protect women against the development of UI later in life.

Lifestyle interventions

Counseling and health education regarding cessation of smoking, decreased intake of alcohol and carbonated drinks have been found to be associated with decreased frequency of UI.^{17,18,28,45,48} Appropriate management of constipation and asthma/respiratory disorders can also reduce the symptoms of UI and pelvic organ prolapse.^{26,45}

Are pelvic floor muscle exercises (PFMEs) beneficial in the prevention of urinary incontinence?

Arnold Kegel was the first one who highlighted the importance of pelvic floor muscles. The aim of Pelvic floor muscle Exercises (PFMEs) is to condition and strengthen pelvic floor musculature via regular exercises to enhance closure of urethral sphincter.

Celiker Tosun O et al had done a randomized controlled clinical trial of 130 women with stress and mixed urinary incontinence after random allocation of participants for pelvic floor muscle training (PFMT). The symptoms of urinary incontinence were significantly reduced in the patients that attained grade 5 pelvic floor muscle strength and continued the pelvic floor muscle training.⁴⁹ García-Sánchez E et al presented a 10 years of data on effectiveness of pelvic floor muscle exercises and found that pelvic floor muscle training programmes are very effective even in preventing UI especially Stress UI.⁵⁰ Similarly, several studies has reported that PFMEs (especially kegel exercises) reduced symptoms of any type of urinary incontinence in women.^{49,51-55} There is still a need of more randomized clinical trials to demonstrate the efficacy of PFMEs in prevention UI in women outside pregnancy. A large number of trials have been done which showed that regular antenatal PFMEs increase strength of pelvic musculature, alleviate distressing urinary symptoms, improve the quality of life in pregnancy and also prevent postpartum UI. ⁵⁶⁻⁶⁴ Boyle R et al reported that pregnant women who were randomised for prophylactic antenatal PFMEs were less likely to report urinary incontinence several months after delivery than women who were randomized to no antenatal PFMEs.⁶⁰ Mørkved S et al presented a data of 22 randomised or quasi-experimental trials and found that PFMEs during pregnancy and after delivery can prevent and treat UI.⁶⁵ However a very limited data shows no effect of PFMEs during pregnancy or after childbirth on UI.⁶⁶ Now supervised PFMEs to all women during their first pregnancy are recommended by NICE guidelines.⁶⁷ Sangsawang B et al found 6-weeks PFME program under supervision more suitable in real clinical situation.⁶⁸

As for primary prevention, if actions are taken early, even in the absence of incontinence, may avoid or delay its onset.

Who should train the women for PFMEs?

The degree of patient's training, proper supervision of PFMEs and its protocols, and the follow-up differ depending on local service provision.⁶⁹ It is impractical to offer supervised PFMT to all pregnant women from a physiotherapist or continence advisor though they have greater in-depth knowledge and expertise of training. NICE guidelines now recommend that the first line treatment for UI should be provided in primary care.⁷⁰ Implementation of nurse delivered PFMT in primary care could significantly reduce the burden of this disabling condition in women. The Water field's study

reported good outcomes of PFMT provided by nurses and if this gets widely implemented, it would greatly reduce the secondary care referrals⁷¹ and Midwives might be the ideal group to offer this to all women in pregnancy. Otherwise, women identified as high risk (factors showed above) can be referred to physiotherapist or continence advisor for intensive PFMEs.

Conclusion

- Identifying risk factors of urinary incontinence is important to screen those women who can develop this prevalent and distressing condition later in their life.
- The effective methods to prevent urinary incontinence are counseling and support for weight reduction, counseling to reduce the number of children, appropriate labor management, lifestyle interventions and supervised pelvic floor muscle training (specifically Kegel exercises).
- Keeping in mind the preventive role of PFMEs, all the women should receive nurse or midwives administered PFMEs in primary care during pregnancy and high-risk patients should be referred to physiotherapist or continence advisor.
- To implement this package of PFMEs given in primary care to pregnant women, nurses and midwives need to be trained first for pelvic floor muscle assessment and for providing PFMEs by general practitioners (GPs).
- Hospitals should have dedicated postnatal clinics to provide care to those women who develop urinary incontinence after delivery.

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