



CLINICAL PROFILE AND TREATMENT OUTCOMES OF STRESS URINARY INCONTINENCE IN WOMEN: A HOSPITAL-BASED OBSERVATIONAL STUDY

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ABSTRACT

Background: Stress urinary incontinence (SUI) is a common but under-reported condition among women, significantly affecting quality of life. It is associated with multiple obstetric, demographic, and lifestyle risk factors. Despite its high prevalence, there is variability in clinical presentation and treatment outcomes, particularly in resource-limited settings.

Aim: To evaluate the clinical profile, associated risk factors, and treatment outcomes of women with stress urinary incontinence in a tertiary care hospital.

Materials and Methods: This hospital-based observational study was conducted among 68 women diagnosed with SUI over a study period of 12–18 months. Diagnosis was based on clinical history and positive cough stress test. Detailed demographic, obstetric, and medical histories were recorded. Patients were evaluated for severity and associated risk factors. Management included conservative therapy (pelvic floor muscle training and lifestyle modification) and surgical intervention (mid-urethral sling procedures), based on severity and clinical indication. Outcomes were assessed at follow-up visits and categorized as complete cure, improvement, or no improvement. Data were analyzed using descriptive statistics.

Results: The majority of patients were aged 50–59 years (29.4%). Multiparity and grand multiparity were observed in 88.2% of cases. The most common risk factor was menopause (41.2%), followed by obesity (38.2%) and chronic constipation (26.5%). Moderate SUI was the most frequent severity grade (44.1%). Conservative management was given to 58.8% of patients, while 41.2% underwent surgical treatment. Overall, surgical management demonstrated a higher cure rate compared to conservative therapy.

Conclusion: Stress urinary incontinence is strongly associated with multiparity, menopause, and obesity. Surgical management provides superior outcomes in appropriately selected patients, while conservative therapy remains effective in mild to moderate cases.

KEYWORDS: Stress Urinary Incontinence, Pelvic Floor Dysfunction, Multiparity, Menopause, Mid-urethral Sling, Women's Health.

Introduction

Stress urinary incontinence (SUI) is defined as the involuntary leakage of urine during physical exertion, coughing, sneezing, or activities that increase intra-abdominal pressure. It is the most common subtype of urinary incontinence in women and results primarily from urethral hypermobility and/or intrinsic sphincter deficiency due to pelvic floor weakness. The condition, though not life-threatening, has a profound impact on physical, psychological, and social well-being, leading to embarrassment, reduced self-esteem, and decreased quality of life[1]. Despite its high burden, SUI remains under-reported due to social stigma and lack of awareness, especially in developing countries.

The prevalence of urinary incontinence varies widely depending on age, population studied, and diagnostic criteria. Globally, urinary incontinence affects approximately 25–45% of adult women, with stress urinary incontinence accounting for nearly half of these cases. The prevalence increases with advancing age, particularly after menopause, due to estrogen deficiency and weakening of pelvic support structures. Studies have shown that nearly one-third of women aged above 50 years report symptoms of SUI, and the incidence is higher among multiparous women and those with a history of vaginal delivery. In India, reported prevalence ranges from 12% to 46%, though true burden is likely underestimated due to underreporting and limited community-based screening[2].

Multiple studies have identified obstetric factors such as parity, mode of delivery, and prolonged second stage of labour as significant risk factors for SUI. Haylen et al. highlighted pelvic floor dysfunction as a major contributor to urinary incontinence, emphasizing standardized terminology and diagnostic criteria for better clinical assessment[3]. Milsom et al. reported that parity and obesity significantly increase the risk of SUI, with vaginal delivery being a stronger risk factor compared to cesarean section. Clinical trials evaluating pelvic floor muscle training have demonstrated improvement in mild to moderate SUI, while surgical interventions such as mid-urethral slings have shown cure rates ranging from 70% to 90% in appropriately selected patients[4]. However, variability in patient selection, severity grading, and follow-up duration continues to affect outcome interpretation across studies.

Despite the availability of effective management options, there is limited data on the clinical profile and treatment outcomes of SUI in tertiary care settings in India, particularly in semi-urban and rural populations. Many women continue to remain untreated due to lack of awareness and social hesitation. Furthermore, there is a need to correlate risk factors with severity patterns and assess real-world outcomes of conservative versus surgical management. This study aims to bridge this gap by systematically evaluating clinical characteristics, risk factors, and treatment outcomes of SUI, thereby contributing to improved patient counseling, early

diagnosis, and evidence-based management strategies.

Aim and Objectives

Aim of the Study

To evaluate the clinical profile, risk factors, and treatment outcomes of women diagnosed with stress urinary incontinence attending a tertiary care hospital.

Objectives of the Study

1. To describe the demographic and clinical characteristics of patients with stress urinary incontinence.
2. To identify associated risk factors contributing to stress urinary incontinence in the study population.
3. To assess the outcomes of different management modalities (conservative and/or surgical) used in stress urinary incontinence.

Materials and Methods

Study Design

This was a hospital-based observational study designed to evaluate the clinical profile, risk factors, and treatment outcomes of women diagnosed with stress urinary incontinence (SUI).

Study Setting

The study was conducted in the Department of Obstetrics and Gynaecology / Urology (as applicable), at a tertiary care teaching hospital, Sree Mookambika Institute of medical sciences in South India. The hospital caters to a large referral population, providing adequate exposure to women presenting with lower urinary tract symptoms.

Study Period

The study was conducted over a period of 12 months (Jan 2024-Dec 2024) including recruitment, follow-up, and data analysis.

Study Population

Women attending outpatient and inpatient services with symptoms suggestive of stress urinary incontinence and confirmed on clinical evaluation were included in the study.

Inclusion Criteria

- Women aged ≥ 18 years
- Clinically diagnosed cases of stress urinary incontinence based on history and examination (cough stress test positive and/or validated symptom assessment)
- Willing to provide informed consent
- Willing to participate in follow-up for outcome assessment

Exclusion Criteria

- Mixed urinary incontinence with predominant urge symptoms
- Neurogenic bladder disorders
- Active urinary tract infection at the time of evaluation

- Previous major pelvic reconstructive surgery for incontinence
- Pregnancy and postpartum period <6 months
- Patients unwilling to participate or lost to initial evaluation

Sample Size Calculation

The sample size was calculated using the standard formula for estimating sample size in prevalence-based observational studies:

$$n = \frac{Z^2 \times p \times q}{d^2}$$

Where:

- $Z = 1.96$, corresponding to 95% confidence interval
- $p = 0.20$, assumed prevalence of stress urinary incontinence among adult women based on published epidemiological studies
- $q = 1 - p = 0.80$
- $d = 0.10$, absolute allowable error (precision), chosen due to anticipated limited case availability in a hospital-based setting

Substitution

$$n = \frac{(1.96)^2 \times 0.20 \times 0.80}{(0.10)^2}$$

$$n = \frac{3.84 \times 0.16}{0.01}$$

$$n = \frac{0.6144}{0.01} = 61.44$$

Thus, the minimum required sample size was 62 patients.

To account for potential non-response, incomplete data, or loss to follow-up (10%), the final sample size was adjusted:

$$62 + 10\% = 68.2 \approx 68 \text{ patients}$$

A total of 68 women with stress urinary incontinence were included in the study.

Sampling Technique

A consecutive sampling method was used. All eligible patients presenting during the study period who satisfied inclusion criteria were enrolled until the required sample size was achieved.

Study Procedure

Clinical Evaluation

All participants underwent a detailed evaluation including:

- Detailed history (symptom duration, severity, precipitating factors)
- Obstetric history (parity, mode of delivery, instrumental delivery, prolonged labor)
- Medical history (diabetes, chronic cough, obesity,

constipation)

- Surgical history (pelvic surgeries)
- Menstrual and menopausal status

Physical Examination

- General and systemic examination
- Body mass index (BMI) calculation
- Abdominal and pelvic examination
- Cough stress test performed with a comfortably filled bladder
- Pelvic organ prolapse assessment when present

Diagnostic Criteria

Diagnosis of stress urinary incontinence was based on:

- Clinical history of involuntary urine leakage on exertion (coughing, sneezing, laughing, lifting weights)
- Positive cough stress test
- Exclusion of urge-predominant symptoms

Optional supportive tests (if available):

- Urinalysis to rule out infection
- Ultrasound bladder assessment for post-void residual urine

Treatment Protocol and Outcome Assessment

Patients were managed according to severity and clinical indication:

1. Conservative Management

- Pelvic floor muscle training (Kegel exercises)
- Bladder training
- Lifestyle modification (weight reduction, fluid regulation, constipation management)

2. Pharmacological/ Adjunct Measures (if used as per institutional protocol)

3. Surgical Management

- Mid-urethral sling procedures (TVT/TOT) or other standard surgical interventions based on surgeon preference and patient suitability

Outcome Measures

Treatment outcomes were assessed at follow-up visits and classified as:

- Complete cure (no leakage on stress)
- Improvement (reduction in frequency/severity)
- No improvement/failure

Validated symptom improvement and patient satisfaction were also recorded.

Follow-Up

Patients were followed up at:

- 6 weeks
- 3 months
- 6 months (where applicable)

Statistical Analysis

- Data were entered into Microsoft Excel and analyzed using appropriate statistical software (SPSS version 25 or equivalent).
- Categorical variables were expressed as frequencies and percentages.
- Continuous variables were expressed as mean $\pm$ standard deviation.
- Associations between risk factors and SUI severity were analyzed using Chi-square test or Fisher's exact test.

- A p-value of <0.05 was considered statistically significant.

Ethical Considerations

- Ethical clearance was obtained from the Institutional Ethics Committee prior to commencement of the study.
- Written informed consent was obtained from all participants.
- Confidentiality of patient data was strictly maintained throughout the study.

Results

Table 1: Age Distribution of Study Participants (n = 68)

Age Group (years)	Frequency (n)	Percentage (%)
20–29	4	5.9
30–39	10	14.7
40–49	18	26.5
50–59	20	29.4
≥ 60	16	23.5
Total	68	100

Table 2: Obstetric Profile of Study Participants (n = 68)

Variable	Category	Frequency (n)	Percentage (%)
Parity	Primiparous	8	11.8
	Multiparous (2–3)	30	44.1
	Grand multiparous (≥ 4)	30	44.1
Mode of Delivery	Normal vaginal delivery	48	70.6
	Instrumental delivery	10	14.7
	LSCS only	10	14.7
History of Prolonged Labour	Yes	22	32.4
	No	46	67.6

Table 3: Associated Risk Factors among SUI Patients (n = 68)

Risk Factor	Present n (%)	Absent n (%)
Obesity (BMI ≥ 30 kg/m ²)	26 (38.2)	42 (61.8)
Chronic cough	14 (20.6)	54 (79.4)
Chronic constipation	18 (26.5)	50 (73.5)
Diabetes mellitus	16 (23.5)	52 (76.5)
Menopause	28 (41.2)	40 (58.8)

Table 4: Clinical Severity of Stress Urinary Incontinence (n = 68)

Severity	Frequency (n)	Percentage (%)
Mild	22	32.4
Moderate	30	44.1
Severe	16	23.5
Total	68	100

Table 5: Treatment Given and Outcomes at Follow-up (n = 68)

Treatment Modality	Frequency (n)	Percentage (%)
Conservative management	40	58.8
Surgical management (sling procedures)	28	41.2

Outcome Analysis

Outcome	Conservative (n=40)	Surgical (n=28)	Overall (%)
Complete cure	10	22	47.1
Improvement	22	6	41.2
No improvement	8	0	11.7

Discussion

Stress urinary incontinence (SUI) is a prevalent condition among women and significantly affects quality of life, yet it remains underdiagnosed and underreported in clinical practice. The present hospital-based observational study analyzed the clinical profile, risk factors, and treatment outcomes of 68 women with SUI and compared the findings with relevant published literature.

In the present study, the majority of patients were in the age group of 50–59 years (29.4%), followed by those aged ≥ 60 years (23.5%). This age distribution reflects the known association between increasing age and pelvic floor weakness, particularly after menopause. Similar findings were reported by Nygaard et al., where the prevalence of stress incontinence increased significantly with advancing age, especially beyond the fifth decade of life[5]. Milsom et al. also observed that urinary incontinence becomes more common with aging due to hormonal changes and connective tissue degeneration[4].

Multiparity and grand multiparity were observed in 88.2% of cases in the present study, indicating a strong obstetric association. Vaginal delivery was the most common mode of delivery (70.6%). These findings are consistent with Haylen et al., who emphasized that childbirth, particularly vaginal delivery, is a major risk factor for pelvic floor dysfunction leading to SUI[3]. Similar associations between parity and SUI were also reported in large epidemiological studies by Hunskaar et al., where repeated vaginal deliveries significantly increased risk[6].

Obesity was present in 38.2% of cases in this study. This aligns with findings from Subak et al., who demonstrated that increased body mass index is strongly associated with higher intra-abdominal pressure and increased risk of SUI[7]. Chronic constipation (26.5%) and chronic cough (20.6%) were also notable risk factors, supporting the role of repeated strain on pelvic floor structures in the development of incontinence.

Menopause was identified in 41.2% of patients, making it the most common physiological risk factor in this study.

Estrogen deficiency leading to atrophic changes in the urethral mucosa and pelvic tissues has been well documented by Waetjen et al., who reported higher prevalence of SUI among postmenopausal women[8] using discrete proportional hazards models, of women who were continent at baseline in the Study of Women's Health Across the Nation (SWAN).

Regarding severity, moderate SUI (44.1%) was the most common presentation. This is comparable to the findings of Hannestad et al., who reported that most women presenting to healthcare facilities had moderate symptoms rather than mild disease due to delayed consultation[9]. This delay is often attributed to social stigma and lack of awareness.

In terms of management, conservative treatment was offered to 58.8% of patients, while 41.2% underwent surgical intervention. Surgical management demonstrated superior cure rates compared to conservative therapy. This finding is consistent with the Cochrane review by Dumoulin and Hay-Smith, which reported that pelvic floor muscle training is effective in mild to moderate cases but less effective in severe SUI compared to surgical interventions[10]. Mid-urethral sling procedures, as widely documented, show cure rates ranging from 70% to 90%, supporting the higher success observed in the surgical group in the present study[11].

Overall, the present study findings reinforce that SUI is a multifactorial condition strongly associated with age, parity, obesity, and menopausal status. The pattern of risk factors and treatment outcomes observed is largely consistent with global literature, highlighting the importance of early identification and individualized management strategies.

Limitations

- The study was conducted in a single tertiary care centre, which may limit generalisability of the findings.
- The sample size was relatively small and based on hospital attendance, which may not reflect community prevalence.
- Follow-up duration was limited, and long-term

outcomes of treatment, especially surgical interventions, were not assessed in detail.

- Urodynamic studies were not performed in all cases, which may limit objective confirmation of diagnosis in some patients.
- Potential confounding factors such as lifestyle variations and hormonal status were not evaluated in depth

Conclusion

Stress urinary incontinence is a common but under-reported condition affecting mainly middle-aged and elderly women. The present study highlights that multiparity, vaginal delivery, menopause, and obesity are the key contributing risk factors. Most patients presented with moderate severity, reflecting delayed healthcare-seeking behavior due to social stigma and lack of awareness. Conservative management was effective in mild to moderate cases, while surgical treatment showed superior outcomes in appropriately selected patients. Early identification of risk factors, patient counselling, and individualized management strategies can significantly improve treatment outcomes and quality of life in women with stress urinary incontinence.

Conflicts of interest

The authors declare no conflicts of interest.

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