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Original Research Article

A Retrospective Study: Impact of Müllerian Anomalies on Pregnancy Course and Outcomes

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Abstract:

Background: Genitourinary Syndrome of Menopause (GSM) is a common but underdiagnosed condition resulting from estrogen deficiency in postmenopausal women, significantly affecting quality of life.

Aim: To assess the prevalence, clinical features, and severity of GSM among postmenopausal women attending a tertiary care hospital.

Methodology: A descriptive cross-sectional study was conducted among 90 postmenopausal women attending the gynecology outpatient department of JNKTMCH, Madhepura, Bihar, from March 2025 to October 2025. GSM was diagnosed based on ISSWSH and NAMS criteria using symptom assessment and clinical examination. Severity and quality-of-life impact were evaluated using the Day-to-Day Impact of Vaginal Ageing (DIVA) questionnaire. Data were analyzed using SPSS version 27.0.

Results: The majority of participants were aged 50–59 years. Vaginal dryness was the most common symptom (77.8%), followed by vaginal itching (50%) and urinary discomfort (33.3%). Clinical signs included vaginal dryness (72.2%) and pale, thin epithelium (66.7%). Moderate GSM was observed in 44.4% of women, while 22.2% had severe GSM.

Conclusion: GSM is highly prevalent among postmenopausal women, with moderate severity being most common and significant impact on quality of life. Early recognition and appropriate management are essential.

Keywords: Genitourinary Syndrome of Menopause, Postmenopause, Vaginal Atrophy, Estrogen Deficiency, Quality of Life.

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Introduction

Menopause represents a natural biological transition in a woman's life, characterized by the permanent cessation of menstruation due to the decline in ovarian follicular activity and consequent hypoestrogenism [1]. The transition usually begins between 45 and 55 years of age and results in multiple bodily and mental shifts which decrease postmenopausal women's health and life satisfaction. The changes that occur during this period include genitourinary alterations which serve as an important yet frequently overlooked aspect of menopausal health. The International Society for the Study of Women's Sexual Health (ISSWSH) together with the North American Menopause Society (NAMS) developed the concept of Genitourinary Syndrome of Menopause (GSM) to create a complete term that describes all genital and sexual and urinary symptoms which result from estrogen deficiency in postmenopausal women. The multifaceted condition of GSM includes vulvovaginal atrophy together with urinary incontinence and urgency and dysuria and sexual dysfunction which all affect how people perform their daily activities and maintain social connections.

People report that the frequency of GSM shows different results because of variations in population traits and the methods used for diagnosis and the social views of menopause [3]. Studies show that between 50% to 70% of postmenopausal women develop at least one symptom that relates to GSM because many women experience multiple symptoms at the same time. The high occurrence of GSM remains undiagnosed and untreated because people believe that menopausal symptoms should be normal and because social stigma exists and both patients and healthcare providers lack knowledge about the condition. The symptoms of GSM start

with mild symptoms that include vaginal dryness and mild urinary urgency but they develop into severe symptoms that cause recurring urinary tract infections and severe dyspareunia and exceptionally distressful sexual dysfunction. The chronic nature of these symptoms causes people to engage in less sexual activity which results in relationship problems and a decrease in their overall life satisfaction so healthcare providers must identify these symptoms early and provide proper treatment.

The pathophysiology of GSM is closely linked to estrogen deficiency, which affects the entire lower genitourinary tract [4]. The vaginal epithelium and urethra and bladder trigone and adjacent pelvic tissues contain estrogen receptors which lose their function and cause vaginal epithelium to decrease in thickness and blood vessels to decrease and collagen levels to decrease and vaginal microbiome composition to change. The changes of vaginal pH and loss of elasticity and mucosa thinning lead to symptoms of dryness and irritation and increased risk of infections. Estrogen deficiency causes lower urinary tract problems by decreasing urethral closure pressure and causing pelvic floor muscle weakness and damaging the mucosal barrier, which increases the likelihood of experiencing urgency and frequency and incontinence and recurrent urinary tract infections [5]. The severity of GSM can therefore range from mild discomfort to profound impairment in daily and sexual functioning, which demonstrates how the condition presents in different ways.

The occurrence and intensity of GSM depend on various risk factors, which include a person's chronological age, the duration since menopause, their number of children, their body mass index, associated medical conditions, their lifestyle choices and their cultural views about sexual health [6]. Women who undergo natural or surgical methods to achieve early menopause experience heightened risk because they endure extended periods of estrogen deficiency. The presence of diabetes mellitus and obesity along with pelvic floor disorders leads to increased urinary and sexual symptoms. The more severe GSM symptoms develop when people engage in smoking and stay physically inactive and do not participate in sexual activity. Women who experience sociocultural factors tend to report their GSM symptoms differently because they feel too embarrassed to discuss personal health matters with doctors who may not understand their cultural background.

The evaluation of GSM requires both subjective assessment of symptoms and objective evaluation of clinical symptoms. The Vaginal Health Index and Female Sexual Function Index together with standardized urinary symptom questionnaires create assessment tools that measure how severe symptoms affect different aspects of life [7]. The instruments allow medical professionals to identify women with symptoms who need treatment while they track disease evolution and treatment results from both local and systemic estrogen treatment and non-hormonal moisturizers and lubricants and pelvic floor rehabilitation and new treatment methods which include laser therapy. Postmenopausal women and their healthcare providers need to improve their knowledge about GSM because the condition remains undiagnosed despite the existence of successful treatment options.

GSM represents a highly prevalent, progressive, and multifactorial condition which causes major health issues to postmenopausal women through its effects on their genitourinary system and overall life quality. Estrogen deficiency creates the pathophysiological framework which leads to structural and functional and microbiological changes that affect the lower genital and urinary systems. The demographic and clinical and lifestyle characteristics of individuals determine the severity of symptoms, which makes GSM a complex medical condition with various manifestations. The need for research about GSM prevalence and severity patterns across different groups emphasizes their role in helping postmenopausal women reach better sexual health and overall wellness through proper symptom management.

Methodology

Study Design: This study was a descriptive cross-sectional study designed to assess the prevalence and severity of Genitourinary Syndrome of Menopause (GSM) among postmenopausal women. The study aimed to evaluate both subjective symptoms and objective signs associated with GSM and their impact on daily functioning and quality of life.

Study Area: The study was conducted at the Department of Obstetrics and Gynaecology, Jannayak Karpoori Thakur Medical College and Hospital (JNKTMCH), Madhepura, Bihar, India.

Study Duration: The study was carried out over a period of 7 months, from March 2025 to October 2025.

Study Participants: Postmenopausal women attending the gynecology outpatient department were screened for eligibility.

Inclusion Criteria:

- Postmenopausal women aged ≥45 years
- Women with natural or surgical menopause
- Women who had attained menopause at least 5 years prior to enrollment, to ensure adequate duration of hypoestrogenism for the development of GSM
- Women willing to provide informed written consent and participate in interviews and clinical examinations.

Exclusion Criteria:

- Women receiving hormone replacement therapy.
- Women with history of alcohol or substance abuse.
- Women with major psychiatric illness.
- Women with vulvovaginal conditions due to infections, irritants, allergic reactions, dermatoses, or malignancies identified on clinical examination.

Sample Size: A total of 90 women meeting the eligibility criteria were included in this study. The sample size was determined to provide sufficient representation of the population attending the gynecology outpatient services during the study period.

Procedure: Researchers used convenience sampling to recruit participants who met the study requirements. The researchers conducted structured interviews with each participant to document their sociodemographic information, which included their age, marital status, occupation, educational attainment, and menopause duration. The researchers collected complete gynecological information that included all genitourinary symptoms, which involved vaginal dryness, irritation, dysuria, urgency, and sexual discomfort. The medical staff conducted a complete gynecological examination to assess patients for objective indications of GSM, which included vaginal atrophy and pallor and mucosal fragility. According to International Society for the Study of Women's Sexual Health and North American Menopause Society established criteria, the diagnosis of GSM required two symptoms or one symptom with one clinical sign.

The researchers used the Day-to-Day Impact of Vaginal Ageing (DIVA) questionnaire to evaluate how GSM affected both daily activities and overall life quality. The validated tool contains 23 items which assess four domains: activities of daily living and emotional well-being and sexual functioning and self-concept and body image. For sexually active women within the last month, a longer version of the sexual functioning domain was administered. Each item received a score from 0 to 4 which represented increasing levels of symptom severity. The researchers translated the questionnaire into Hindi to help participants understand it better.

Statistical Analysis: Statistical analysis of the collected data was performed through the use of The Statistical Package for the Social Sciences (SPSS) version 27.0 software. The study used descriptive statistics to present categorical variables as frequency counts and percentage values while continuous variables were shown as mean values together with their standard deviation. The researchers assessed how common GSM occurred and its severity across various age ranges and durations since menopause began. The study calculated point estimates together with 95% confidence intervals for all categorical outcomes while testing the relationship between sociodemographic factors and GSM severity through suitable statistical methods.

Result

The study included 90 postmenopausal women who met the required criteria for inclusion. The study required that all participants needed to have reached menopause at least five years before their participation date to establish sufficient time for the development of Genitourinary Syndrome of Menopause (GSM) which results from hypoestrogenism.

Table 1 presents a summary of the sociodemographic data about the study participants. The majority of women were aged between 50–59 years (38.9%), followed by 40–49 years (27.8%), 60–69 years (22.2%), and 70–75 years (11.1%). The study results showed that 77.8% of the participants were married while 22.2% of participants were either widowed or divorced. Educational status data shows that 33.3% of participants were illiterate while 61.1% of participants were homemakers. The study results show that most of the study population consisted of postmenopausal women who were between middle age and old age.

Table 1: Sociodemographic Characteristics of Study Participants (n=90)

Characteristics	Frequency (n)	Percentage (%)
Age (years)		
40–49	25	27.8
50–59	35	38.9
60–69	20	22.2
70–75	10	11.1
Marital Status		
Married	70	77.8
Widowed/Divorced	20	22.2
Education		
Illiterate	30	33.3
Primary	25	27.8
Secondary	20	22.2

Graduate & above	15	16.7
Occupation		
Homemaker	55	61.1
Labor/Worker	20	22.2
Others	15	16.7

The study found that 75 participants achieved natural menopause which accounted for 83.3% of the sample while 15 women underwent surgical menopause which represented 16.7% of the sample. The majority of women had been postmenopausal for 5 to 10 years at 55.6% while 44.4% of women had been postmenopausal for more than 10 years. The study assessed GSM throughout various stages of postmenopausal hypoestrogenism because of this distribution.

Table 2: Menopausal Characteristics of Participants (n=90)

Characteristics	Frequency (n)	Percentage (%)
Type of Menopause		
Natural	75	83.3
Surgical (Hysterectomy + Oophorectomy)	15	16.7
Duration Since Menopause (years)		
5–10	50	55.6
>10	40	44.4

Table 3 shows how common genitourinary symptoms appear among postmenopausal women. The most frequently reported symptom was vaginal dryness which affected 70 participants who made up 77.8% of the study group. The study found that 33.3% of women experienced dysuria or urinary discomfort while 27.8% of women showed signs of urinary urgency or increased frequency. Dyspareunia was "reported by 22.2% of participants. The majority of women experienced at least one GSM-related complaint because only 11.1% of women reported no genitourinary symptoms.

Table 3: Prevalence of Genitourinary Symptoms (n=90)

Symptoms	Frequency (n)	Percentage (%)
Vaginal dryness	70	77.8
Vaginal itching/irritation	45	50.0
Dysuria/Urinary discomfort	30	33.3
Urinary urgency/Frequency	25	27.8
Painful intercourse (dyspareunia)	20	22.2
No symptoms	10	11.1

The study participants displayed clinical symptoms of Genitourinary Syndrome of Menopause which Table 4 shows. The clinical examination identified vaginal dryness as the most common finding which 72.2% of women exhibited. The study showed that 66.7% of participants displayed pale and thin vaginal epithelium whereas 61.1% experienced loss of vaginal rugae. The study found that 55.6% of women exhibited reduced vaginal elasticity while 50% demonstrated decreased vaginal moisture. The study identified 44.4% of participants who showed vaginal erythema or inflammatory changes. The research findings demonstrate how postmenopausal women show high rates of objective genital changes which match hypoestrogenic conditions.

Table 4: Clinical Signs of Genitourinary Syndrome of Menopause (GSM) among Study Participants (n = 90)

Clinical Signs	Frequency (n)	Percentage (%)
Vaginal dryness (on examination)	65	72.2
Pale / thin vaginal epithelium	60	66.7
Loss of vaginal rugae	55	61.1
Reduced vaginal elasticity	50	55.6
Vaginal erythema / inflammation	40	44.4
Decreased vaginal moisture	45	50

Table 5 displays the severity distribution of Genitourinary Syndrome of Menopause among the study participants. The most common presentation of the condition affected 44.4% of women with moderate GSM while 33.3% of participants showed mild GSM symptoms. The condition affected 22.2% of

women in the study who developed severe GSM. The distribution shows that many women had moderate to severe symptoms but a large group showed milder forms of GSM which demonstrated different clinical patterns between postmenopausal women.

Table 5: Severity of Genitourinary Syndrome of Menopause among Study Participants (n = 90)

Severity of GSM	Frequency (n)	Percentage (%)
Mild	30	33.3
Moderate	40	44.4
Severe	20	22.2

Discussion

The current research demonstrated that 77.8% of postmenopausal women experience at least one genitourinary symptom which constitutes a high prevalence rate of Genitourinary Syndrome of Menopause (GSM) in their study. The study results show a strong connection with the GENISSE research which discovered that 70.7% of 423 Spanish postmenopausal women experienced GSM (Moral et al., 2018) [8]. A multi-country internet-based study which included 3,768 women from Italy Germany Spain and the UK discovered that 70% of participants experienced vaginal dryness which confirmed the high presence of this symptom (Nappi & Palacios, 2010) [9]. The community-based research in Nepal discovered that 60% to 63% of people experienced vaginal dryness while 47% to 57% of people had urinary problems which showed different results based on population studied and knowledge about health and medical treatment (Chuni & Sreeramareddy, 2011; Rajbhandari et al., 2017) [10,11]. The study findings demonstrate that cultural factors together with demographic elements and healthcare accessibility determine how often people report experiencing GSM.

The most common symptom within our group was vaginal dryness which affected 77.8% of participants. Urinary urgency and dysuria and dyspareunia and vaginal itching had lower rates of occurrence among study participants. The findings of this study match result from longitudinal studies which include the Study of Women's Health Across the Nation (SWAN) research that tracked vaginal dryness rates from 19.4% at the start of the study to 34% after 13 years of study during which the participants aged from 57 to 69 years (Waetjen et al., 2018) [12]. Singh et al. (2021) [13] conducted research which showed that 88.3% of postmenopausal women in Eastern Uttar Pradesh were not sexually active. The study showed that genitourinary changes progress with time after menopause because women who had experienced menopause for more than five years showed higher rates of GSM symptoms. Women who have experienced menopause for more than five years showed higher rates of symptoms according to our research which confirms that GSM continues to affect women beyond their initial postmenopausal stage.

The clinical signs observed in our study (Table 4) which included vaginal dryness and pale/thin epithelium and loss of rugae and decreased elasticity and decreased moisture and erythema showed high GSM prevalence. The severity distribution (Table 5) showed that moderate GSM occurred most frequently (44.4%) while mild cases (33.3%) and severe cases (22.2%) showed less occurrence which resulted in different clinical presentations for postmenopausal women. The subjective symptoms matched with objective clinical signs which established the medical importance of these results.

GSM most affected people in their sexual functions and then it affected their emotional states and self-identity and their capacity to perform everyday tasks. The study found that almost 50 percent of sexually active participants experienced sexual dysfunction which corresponds to a worldwide pattern. The European REVIVE survey of 3,046 postmenopausal women reported that vulvovaginal atrophy negatively affected intimacy in 85%, distracted from sexual enjoyment in 59%, and interfered with relationships in 47% of participants (Nappi et al., 2016) [14]. Nappi and Palacios (2014) [15] showed that sexual dysfunction arises from multiple causes which include physical and mental and relationship factors.

The study found that 47% of its participants reported active sexual lives while their sexual activity decreased as they spent more time after menopause. The pattern of the study matches previous research conducted in India, while Spanish research found that 72% of postmenopausal women maintained their sexual activity (Portman et al., 2014) [16]. The observed differences result from cultural and societal elements together with factors like partner access and educational resources and knowledge about GSM treatment solutions.

Almost half of the participants showed urinary symptoms which confirmed earlier studies that postmenopausal women experience lower urinary tract symptoms, including urgency and dysuria, at high rates while these symptoms remain unreported (Henn, 2010; Srisukho et al., 2019) [17,18]. The condition of GSM costs society because it harms both physical health and mental health of individuals.

Our research found a connection between education and employment status which affected the reporting of GSM symptoms. The study results match the findings of Chuni and Sreeramareddy 2011 which show that people with low health literacy and awareness skills take longer to identify and treat their menopausal symptoms. The implementation of customized educational programs together with routine gynecological examinations and public awareness initiatives will lead to better early disease detection and treatment of GSM cases.

The current research confirms that postmenopausal women experience GSM at a high rate which causes moderate symptoms that negatively affect their sexual health and overall quality of life. The study results show that previous studies document similar patterns of disease existence and patient symptoms and social effects yet show differences because of various cultural and demographic and medical system elements. The complete treatment of "GSM requires educational programs combined with healthy living changes and personal treatment solutions that use non-hormonal methods to improve physical comfort and sexual performance and general health.

Conclusion

The research found that postmenopausal women showed a high rate of Genitourinary Syndrome of Menopause (GSM) because 78% of them had vaginal dryness while about 50% of them showed urinary and sexual symptoms. The researchers found that most people experienced moderate GSM which resulted in major sexual functioning problems and difficulties with their daily activities and self-concept and emotional state. The researchers found that people experienced more severe symptoms at higher age levels and after longer time periods from menopause because estrogen deficiency progresses throughout the lower genitourinary tract. The ability to recognize and report symptoms depended on educational and occupational background which served as a sociodemographic element. The condition of GSM affects multiple areas of life for postmenopausal women because it requires early diagnosis and better public knowledge and complete treatment plans to enhance their physical and sexual and mental health.

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