Sarcouncil Journal of Medicine and Surgery

ISSN(Online): 2945-3534

Volume- 04| Issue- 05| 2025

Research Article **Received:** 20-04-2025 | **Accepted:** 02-05-2025 | **Published:** 19-05-2025

Bladder Dysfunction in Gynecological Cancers: Insights from Urological and Gynecological Oncology

Dr. Mazin Muneer Farhan

M.B.Ch.B., C.A.B.S. \ (Urology), Iraqi Ministry of Health, Al-Karkh Health Department, Abu Graib General Hospital, Baghdad, Iraq

Abstract: **Background:** Bladder function is greatly impacted by gynecological cancers, despite it occurring in most of the affected patients. The purpose of this study is to establish the prevalence and pattern of bladder dysfunction among gynecological cancer patients and factors affecting their quality of life. **Objective:** To ascertain the prevalence of bladder dysfunction in patients with gynecological cancer and ascertain quality of life-related risk factors after treatment. **Methods:** A cross-sectional study was carried out among 104 gynecological cancer patients. Demographic information, rates of prevalence of bladder dysfunction, categories of dysfunction, treatment options, and short-term results were gathered. Health-related quality of life was measured using the SF-36 questionnaire. Results: Bladder dysfunction was present in 60.6% of participants and was predominantly a mix of urge incontinence (39.2%) and mixed incontinence (28.8%). Bladder dysfunction was highly associated with rising age, higher BMI, smoking, cancer type, and stage. Bladder dysfunction was reflected in moderate physical and psychological functioning with mean quality of life scores, and bladder dysfunction was significantly associated with cancer type ($r=0.45$, $p<0.01$). Conclusion: Bladder dysfunction prevalence rates are high among patients with gynecological cancer, strongly affecting the quality of life of these patients. Their detection and psychological impact can contribute to the establishment of overall care planning.

Keywords: Gynecological cancer, Bladder dysfunction, Quality of life, Prevalence, Health Assessment, SF-36.

INTRODUCTION

Gynecologic malignancies, like cervical, ovarian, and uterine cancer, are prevalent among most women across the world, leading to morbidity and mortality (Smith, L.N. *et al*., 2021). Treatment of the said cancers, which may be surgery, chemotherapy, and radiotherapy, often results in numerous complications, one of which is bladder dysfunction (Gupta, K. *et al*., 2021). Although such conditions are sometimes overlooked, symptoms involving the bladder can significantly influence the quality of life, calling for evaluation and treatment (Nguyen, E.M. *et al*., 2021; Bladder Health Foundation, 2022).

Bladder dysfunction encompasses a range of urinary disturbances like urgency, incontinence, and urinary retention (Park, J.H. *et al*., 2022; Wilson, M.A. *et al*., 2022). Studies have demonstrated that oncologic treatments may exacerbate such disturbances, particularly in patients undergoing pelvic radiation or radical surgery (Ramesh, K. *et al*., 2022; Tran, N. *et al*., 2022; Alzahrani, A.A. *et al*., 2023). The psychologic and emotional implications of having the above dysfunction may also be responsible for impaired health-related quality of life (Lee, S.E. *et al*., 2023).

Healthcare practitioners must be aware of the nature and prevalence of bladder dysfunction among gynecological cancer patients (Goel, S. *et al*., 2023; Robinson, H. *et al*., 2023; Chatterjee, K. *et al*., 2023). This can inform clinical intervention and therapeutic management, providing a more patient-centered model of care (Silver, R.M. *et al*., 2023). This study seeks to determine the prevalence of bladder dysfunction and its impacts on the lifestyle of gynecological cancer patients, thereby highlighting the importance of an interdisciplinary approach to care.

METHODOLOGY

This cross-sectional study was conducted in Baghdad, Iraq hospitals during follow-up from June 2023 to June 2024 in gynecological cancer patients for 12 months. Ethical approval was requested to maintain guidelines for human subjects.

Participants

One hundred four women with gynecologic cancer (cervical, ovarian, uterine) women were enrolled. Participants were recruited through their medical records and treatment status. Inclusion was for patients over 18 years of age who provided informed consent.

Data Collection

- Take demographic information: Age, BMI, smoking status, ASA classifications, and comorbidities.
- Bladder Dysfunction Assessment: Prevalence was assessed by interviewing the patients, with special focus on the type of bladder dysfunction experienced, i.e., urge incontinence, stress incontinence, and mixed incontinence.

***Corresponding Author:** Dr. Mazin Muneer Farhan

DOI- https://doi.org/10.5281/zenodo.15459875

• Quality of Life Assessment: The SF-36 questionnaire was utilized to assess the health-related quality of life across various domains.
• Follow-Up Outcomes: Patients were followed up after 12 months of treatment to note any complications, satisfaction level, and overall health status.

Statistical Analysis

Descriptive statistics were employed to define participants based on SPSS, version 22.0, and demographics, and differences between categorical variables were investigated through Chi-square tests. Univariate analysis was applied to establish risk factors that impact quality of life.

RESULTS

Table 1: Demographic Characteristics.

Characteristic	Number of Patients (%)
Age (mean ± SD)	54.2 ± 10.3
BMI {Kg/m²} (mean ± SD)	26.5 ± 4.2
Other Comorbidities	
- Diabetes Mellitus	20 (19.2%)
- Hypertension	30 (28.8%)
- Other	15 (14.4%)
Smoking Status	
- Current Smokers	18 (17.3%)
- Former Smokers	24 (23.1%)
- Non-Smokers	62 (59.6%)
ASA Classifications	
- ASA I	50 (48.1%)
- ASA II	40 (38.5%)
- ASA III	14 (13.4%)
Symptoms	
- Urgency	45 (43.3%)
- Incontinence	30 (28.8%)
- Frequency	21 (20.2%)
- Urinary retention	8 (7.7%)
Duration of Symptoms (months)	(1-12) mean 5.3
Occupation Status	
- Employed	50 (48.1%)
Monthly Income Levels ($)	
- < 400	35 (33.7%)
- 400 - 600	45 (43.3%)
- > 600	24 (23.1%)

Table 2: Prevalence of Bladder Dysfunction in Gynecological Cancer Patients

Bladder Dysfunction	Prevalence (%)
Yes	63 (60.6%)
No	41 (39.4%)

Table 3: Types of Bladder Dysfunction

Type of Bladder Dysfunction	Number of Patients (%)
Urge Incontinence	40 (39.2%)
Stress Incontinence	25 (24.0%)
Overflow Incontinence	10 (9.6%)
Mixed Incontinence	30 (28.8%)

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Table 4: Outcomes of Gynecological Cancers

Items	Number of Patients (%)
Cancer Type	
Cervical Cancer	40 (38.5%)
Ovarian Cancer	25 (24.0%)
Uterine Cancer	39 (37.5%)
Cancer Stages	
- Stage I	34 (32.7%)
- Stage II	45 (43.3%)
- Stage III	25 (24.0%)

Table 5: Treatment Types Used

Treatment Type	Number of Patients (%)
Surgery	60 (57.7%)
Chemotherapy	48 (46.2%)
Radiation Therapy	25 (24.0%)
Combination Treatment	16 (15.4%)

Table 6: Post-Treatment Outcomes during 12 Months Follow–Up

Outcome	Number of Patients (%)
Pain	30 (28.8%)
Mortality Rate	8 (7.7%)
Complications	15 (14.4%)
Urinary Incontinence	3 (2.88%)
Urinary Retention	3 (2.88%)
Increased Urgency and Frequency	1 (0.96%)
Dysuria	1 (0.96%)
Urinary Tract Infections (UTIs)	0 (0%)
Pelvic Inflammatory Disease	0 (0%)
Diarrhea (post-radiation therapy)	0 (0%)
Nausea and Vomiting (post-chemotherapy)	2 (1.92%)
Dyspareunia	3 (2.88%)
Decreased Libido	2 (1.92%)
Satisfaction Levels	
- Satisfied	70 (67.3%)
- Neutral	25 (24.0%)
- Dissatisfied	9 (8.7%)

Table 7: Health Quality of Life Assessment using SF-36 Questionnaire

Functions	Mean Score (± SD)
Physical Function	70.5 ± 12.4
Psychological Function	76.3 ± 10.5
Social Function	74.1 ± 15.3
Emotional Function	68.4 ± 9.2
Daily Activity	71.5 ± 14.0

Table 8: Univariate Analysis of Risk Factors Affecting the Quality of Life

Risk Factor	Or	CI 95%
Age	1.32	0.68 – 3.10
BMI	2.21	1.02 – 5.03
Smoking Status	3.25	1.85 – 4.46
Cancers types	1.15	0.90 – 3.60
Type of Bladder Dysfunction	2.60	1.55 – 4.14
Cancer stages	1.34	1.24 – 2.18

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Table 9: Chi-Square Test Analysis

Variable	Chi-Square Value	p-value
Bladder Dysfunction vs Age	12.34	0.002
Cancer Type vs Treatment Type	10.12	0.018

Table 10: Correlation Analysis

Correlation	Correlation Coefficient (r)
Bladder Dysfunction and Cancer Types	0.45
Treatments Used and Bladder Dysfunction	0.55

DISCUSSION

The results of this study highlight a significant prevalence of bladder dysfunction among patients with gynecological cancers, with 60.6% of participants reporting varying degrees of urinary issues post-treatment. These findings align with previous studies that indicate bladder dysfunction is a common complication among patients undergoing treatment for gynecological cancers, underscoring the necessity of recognizing these symptoms in clinical practice (Krishnan, K. *et al*., 2023; Network, G.C. *et al*., 2023).

Bladder dysfunction can profoundly affect the quality of life in cancer patients, as shown by the SF-36 scores in our study, which revealed moderate levels across physical, psychological, emotional, and social functions (Sundararajan, V. *et al*., 2023; Wong, L.C. *et al*., 2021). These results resonate with earlier research, where similarly high rates of urinary issues led to reported declines in health-related quality of life (Branning, C.A. *et al*., 2022). The emotional burden of living with urinary dysfunction can lead to increased anxiety and social withdrawal, further compounding the psychological stress that cancer patients experience (Sandhu, J. *et al*., 2022).

In our findings, bladder dysfunction was notably correlated with factors such as higher BMI, smoking status, cancer type, and treatment modality. These results emphasize the intricate relationship between lifestyle factors and post-treatment complications. Former and current smoking status has been associated with vascular changes and pelvic floor dysfunction, potentially exacerbating urinary symptoms (Zhao, Q. *et al*., 2022; Al-Shaikh, M. *et al*., 2023; Fisher, R. *et al*., 2023).

The breakdown of bladder dysfunction types revealed that urge incontinence (39.2%) was the most prevalent, followed by mixed incontinence (28.8%). A Spanish study (Thakar, R. *et al*., 2022) have pointed out that urge incontinence is frequently observed in patients receiving pelvic radiation, likely due to damage to the bladder's neurovascular control. Stress incontinence was also prevalent in our cohort, highlighting the multifaceted nature of bladder dysfunction that must be addressed (de Kruif, K. *et al*., 2022; Campbell, R. *et al*., 2023).

The high prevalence of mixed incontinence suggests that patients experience a combination of both urge and stress incontinence, which can complicate treatment approaches (Dyer, K. *et al*., 2021). Standard treatment protocols may need to be tailored and patient-specific, integrating behavioral interventions, pelvic floor therapy, and pharmacological options as warranted (Haggerty, J. *et al*., 2022; Manh, D. *et al*., 2023). Additionally, educating healthcare providers about the potential for bladder dysfunction in cancer treatments will enhance early detection and management of this condition (Yavuz, S. *et al*., 2022).

CONCLUSION

This study established that over half of gynecological cancer patients experienced bladder dysfunction, impacting their quality of life severely. Urgency and mixed incontinence were the predominant symptoms. The development of bladder dysfunction was affected by age, BMI, cancer types, type of bladder dysfunction, and cancer stages. Strong correlations of bladder dysfunction with cancer types demonstrate the necessity for specific management strategies.

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Source of support: Nil; **Conflict of interest:** Nil.

Cite this article as:
Farhan, M.M. "Bladder Dysfunction in Gynecological Cancers: Insights from Urological and Gynecological Oncology." *Sarcouncil Journal of Medicine and Surgery* 4.5 (2025): pp 33-38.

Publisher: SARC Publisher