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## **Age and Gender Disparities in Bladder Cancer: A Cross Sectional Study in Bangladesh**

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### **Abstract**

#### **Background with Objective**

Worldwide Urinary bladder carcinoma (UBC) is one of the most common cancers of genitourinary system. Carcinoma of the urinary bladder is one of the leading causes of death for both men and women. Female-gender patients diagnosed with bladder cancer have a higher risk of recurrence, progression, and cancer-specific mortality compared with their male counterparts. The aim of this study was to focus on the age and sex disparities in bladder carcinoma.

#### **Methods**

This descriptive cross-sectional study was carried out among 50 patients presenting with malignant tumor in urinary bladder at Pathology department for histopathology, Dhaka Medical College Hospital, Dhaka, from January 2016 to December 2017. Purposive sampling method was followed. Statistical analysis of the results was obtained by using window based computer software devised with Statistical

Packages for Social Sciences (SPSS-20.1).

#### **Results**

Male patients (80%) were suffering from more malignant tumor in urinary bladder than female patients (20%). Maximum (58.0%) patients were below or equal to 60 years. 36 (72.0%) patients had high grade of urothelial carcinoma (HGUC). High grade tumor is more common in 51-60 years followed by 61-70 years. High grade tumor was more common in female patients (90%). There was no significant difference in tumor marker Her2/neu score and Ki-67 level between two age groups ( $P > 0.05$ ).

#### **Conclusion**

Biological sex is an independent risk factor of cancer. Male patients suffering from more bladder cancer than female but female patients have a greater reduction in lifespan compared to males.

**Keywords:** Bladder Cancer, Age and Sex Disparities, Cross Sectional Study

### **Introduction**

Bladder cancer also referred to as urothelial cancer is the second most common genitourinary malignancy, with over 60000 new cases and more than 13000 deaths from the disease annually in the United States [1]. It is the eighth highest cancer related mortality rates in American men [2]. Bladder cancer is three to four times more common among males than females [3]. In men; it is the fourth most common cancer accounting for 7% of all cancers. In woman, it is the ninth most common cancer accounting for 2.4% of all cancer [2]. Males are 3 to 4 times more likely to develop bladder cancer than females, presumably because of an increased prevalence of smoking and exposure to environmental toxins [4]. There are varieties of occupations statistically associated with bladder cancer formation and all are industrial in nature [5]. In addition to the skin and lungs, bladder is the main internal organ affected by the occupational carcinogens. Aromatic amines are the primary culprits that bind to DNA [6]. The risk of developing invasive bladder cancer is age dependent [2]. Men from birth to age 39 years, the incidence rate of invasive bladder cancer was 0.02%; ages 40 to 59 years, 0.41%; ages 60 to 69 years, 0.96%; ages 70 years and older, 3.5%; and from birth to death, 3.7%. The bladder cancer incidence for women from birth to age 39 was 0.1%; ages 40 to 59 years, 0.13%; ages 60 to 69 years, 0.26%; ages 70 years and older, 0.99%; and from birth to death, 1.17% [7]. The risk of

developing invasive bladder cancer is age dependent [2]. Adolescents and young adults (less than age 40 years) tend to develop well-differentiated noninvasive, rather than invasive, bladder cancer. Although the disease may occur in young person's but >90% of new cases occur in persons >55 years of age [8].

### Materials & method

This descriptive cross-sectional study was carried out among 50 patients presenting with malignant tumor in urinary bladder at Pathology department for histopathology, Dhaka Medical College Hospital, Dhaka, from January 2016 to December 2017. Immunostaining for HER2/neu and Ki67 were done at Armed Forces Institute of Pathology, Dhaka. Both Ki67 and HER2/neu immune staining was done on all this 50 cases. Purposive sampling method was followed. Statistical analysis of the results was obtained by using window based computer software devised with Statistical Packages for Social Sciences (SPSS-20.1). The study was approved by the institutional ethical committee.

### Results

According to Table 1, male patients (80%) were suffering from more malignant tumor in urinary bladder than female patients (20%). Maximum (58.0%) patients were below or equal to 60 years and 42.0% patients were more than 60 years old. Mean age of the patients were  $60.9 \pm 13.1$ . 36 (72.0%) patients had high grade urothelial carcinoma (HGUC) and 14 (28.0%) patients had low grade urothelial carcinoma (LGUC).

**Table 1:** Socio-demographic Characteristics of the study population (n=50)

Parameter	Number	percentage
<b>Gender</b>		
Male	40	80%
Female	10	20%
<b>Age</b>		
≤60 years	29	58%
>60years	21	42%
Mean ± SD (Min-Max)	60.9 ± 13.1 (20 - 88)	
<b>Tumor grading</b>		
High Grade	36	72%
Low Grade	14	28%

According to Table 2, High grade tumor was more common in 51-60 years (30.6%) followed by 61-70 years (27.8%).

**Table 2:** Distribution of patients with grading of tumor according to age

Age	High Grade (%) (n=36)	Low Grade (%) (n=14)
≤50 years	8 (22.22%)	2 (14.3%)
51-60 years	11(30.6%)	8 (57.1%)
61-70 years	10(27.8%)	2 (14.3%)
>70 years	7(19.4%)	2 (14.3%)

According to Table 3, High grade tumor was more common in female patients (90%).

**Table 3:** Distribution of patients with grading of tumor according to sex

Sex	High Grade	Low Grade
Male	27 (67.5%)	13 (32.5%)
Female	09 (90%)	01 (10%)

According to Table 4, there was no significant difference in tumor marker Her2/neu score and Ki-67 level between two age group (P>0.05).

**Table 4:** Comparison of tumor marker HER2/neu and Ki67 score with age (n=50)

Tumor marker	≤60 years (Mean ± SD)	>60 years (Mean ± SD)	p-value
HER2/neu	1.48 ± 0.73	1.80 ± 0.87	0.159
Ki 67	45.00 ± 29.42	50.00 ± 31.74	0.569

\*Unpaired t test was done to measure the level of significance.

### Discussion

In this study, male patients were suffering more bladder cancer than female patients and male to female ratio was found 4:1. Similar findings were also stated in the study of Jawad, Ali and Kamal, (2016). In their study male was 73.3% and female was 26.7% [9]. The higher incidence of urinary bladder cancer in male may be due to the personal habit such as smoking and more exposed to toxic agents due to their occupation. In this study, mean age of the patients was  $60.9 \pm 13.1$  years and is similar to the study of Gupta *et al.*, (2009) which was  $60.2 \pm 4.4$  years [10]. A similar study by Hossain, 2010 in BSMMU, Dhaka, found most of the patient with bladder cancer to be over 50 years of age [11]. In our study 36(72.0%) patients had high grade urothelial carcinoma (HGUC) and 14(28.0%) patients had low grade urothelial carcinoma (LGUC). Chou *et al.*, (2013) in their study found 56.8% high grade and 43.2% low grade tumor [12]. Incidence of high grade urinary bladder carcinoma patient was more in our study. High grade tumor was more common in female patients (90%). Sheng Zhu and Huasheng Zhao (2023) conducted a study in china about Sexual dimorphism in bladder cancer [13]. In their study they stated that advanced bladder cancer is more common in females. Extensive research has confirmed women's association with poorer oncological outcomes, including an elevated likelihood of mortality, disease recurrence and disease progression. There was no significant difference between expression of HER2/neu and Ki67 expression with age of the patient. Jawad Ali and Kamal., (2016) found similar to these findings [9].

### Conclusion

In our study, male patients suffering from more urothelial cancer than female patients but high grade tumor was more common in female patients. The etiological factors such as smoking, occupational exposures and genetic mutations exhibits disparities in incidence rates and outcomes for male and female bladder cancer patients. In order to prevent, diagnose, and treat bladder cancer more accurately and fairly, future research should focus more on the complex interactions between sex-related factors.

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### Conflict of Interest

Authors declare no conflict of interest.

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