

Urinary bladder cancer in Jordanian adults: A histopathological and epidemiological study from a tertiary care center in Amman

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Abstract

The aim of this retrospective study was to analyze urinary bladder cancer cases that were diagnosed in Jordan University Hospital, Amman according to age, gender, grade and muscle invasion. There were 212(85.1%) male and 37(14.9%) female patients. Of them, 115(46.2%) patients were aged <65 years (range: 25-64 years), 128(51.4%) were aged 65-84 years, and 6(2.4%) were aged > 85 years. Analysis of transitional cell carcinoma cases revealed that 143(59.3%) of the cases were of low grade, while 98(40.7%) were of high grade. Of these cases, 199(82.6%) were superficial, whereas 42(17.4%) were muscle invasive at initial diagnosis. Of the high-grade tumour cases, 57 (58.2%) and 5(5.1%) were found in the age groups 65-84 and >84 years, respectively. Both the grade and the muscle-invasion status were not significantly associated with patient gender. Our study showed significant demographic changes in urinary bladder cancer in comparison to a previous study from northern Jordan.

Keywords: Carcinoma, Transitional cell, Prognosis, Jordan.

Introduction

Urinary bladder cancer ranks ninth among other common types of cancer worldwide with an estimated incidence of 430000 cases and about 165000 cancer deaths.¹ The incidence of bladder cancer shows a striking male predominance (75%) and substantially varies geographically.¹ Much of geographic and sex variations are attributed to disparities in the prevalence of tobacco smoking.²

Bladder cancer is one of the major cancer sites for males in Jordan and some Middle East countries.³ However, Age standardized rates of bladder cancer in Jordan declined significantly over the period 1996-2009.³ Cigarette smoking is the main risk factor for urinary bladder cancer in Jordan.⁴

Recent reports demonstrated the important relationship

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between demographic variations and the biology and prognosis of urinary bladder cancer.^{5,6} Although men are more likely to develop the disease, female gender is associated with more advanced disease and thus more mortality-to-incidence ratio.⁵ Multiple factors such as the differences in exposure to carcinogens and the cellular responses that they induce may explain the variations in disease behaviour between the genders.⁷ The role of steroid hormones and their receptors is a suggested explanation for these differences, but these mechanisms remain unclear and further investigations are required.⁸ Advanced age is well known to be a major independent risk factor for developing this malignant tumour. Moreover, the ratio of cancer-specific mortality to incidence is higher for older adults.⁹ Social and therapy-related factors may contribute to these differences. In addition, in older populations, these tumours tend to be of higher grade compared with younger patients.⁶

Our study is the largest of its kind in Jordan, and it aims to analyze bladder cancer cases with regard to age, gender, grade and muscle invasion, and to compare the results with regional and international reports, which would assist in better management guidelines and more advanced researches on bladder cancer in Jordan.

Methods and Results

This retrospective study was carried out at the Jordan University Hospital (JUH), Amman, and comprised urinary bladder cancer cases that were diagnosed from January 2008 to September 2017. JUH is a major referral hospital that provides services for large population of the capital city Amman and surrounding region of central Jordan. Approval of the study was granted by the institutional review board. Data and slides were retrieved from the archives of the pathology department. The collected data included the age at diagnosis, gender, tumour histological type, grade and muscle invasion status. The slides were reviewed by two pathologists. Grading of the tumours was according to the 2004 WHO/ISUP classification system.¹⁰ Data analysis was performed using SPSS v 20. Descriptive statistics and Pearson's chi-squared test were used, and $P < 0.05$ was considered significant.

Of the 249 cases investigated, there were 212(85.1%)

Table-1: Patient characteristics of transitional cell carcinoma cases.

Criteria	Numbers	%
Age (years)		
25-64	112	46.0
65-84	123	51.0
>84	6	3.0
Gender		
Male	206	86.0
Female	35	14.0

male and 37(14.9%) female patients, with a male-to-female ratio of 5.7:1. Of them, 115(46.2%) patients were aged <65 years (range: 25-64 years), 128(51.4%) were aged 65-84 years, and 6(2.4%) were aged > 84 years. The mean age was 64.3±12.39years. Most of the cases 165(66.3%) were diagnosed in the age group 60-84.

Transitional cell carcinoma was the most common histopathological type 241(97%), followed by squamous cell carcinoma 5(2%) and adenocarcinoma 3(1%).

For transitional cell carcinoma cases, male-to-female ratio was of 5.9:1. The mean age was 64.2±12.44 years, with most of the cases 129(54%) were diagnosed in the age group >64 years (Table-1). Further analysis of transitional cell carcinoma cases revealed that 143(59.3%) cases were of low grade, while 98(40.7%) were of high grade. The number of muscle-invasive tumour cases was 42(17.4%), while 199(82.6%) were superficial.

Transitional cell carcinoma cases classified according to WHO/ISUP grade¹⁰ were then analyzed according to demographic criteria. Of the high-grade tumours, only 36(36.7%) were in the age group 25-64 years, while 76 cases (53.1%) of the low-grade tumours were in this age group. For the high-grade tumours, male-to-female ratio was of 6.5:1, while for lower grade tumours, male-to-female ratio was of 5.5:1 (Table-2).

Further analysis of muscle-invasive tumour cases revealed that there were 36(85.7%) male and 6(14.3%) female

patients, with a male-to-female ratio of 6:1, while for superficial tumours, male-to-female ratio was of 5.9:1. Of the muscle-invasive tumour cases, 17(40.5%) patients were aged <65 years (range: 25-64 years), 24(57.1%) were aged 65-84 years, and 1(2.4%) >84 years (Table-2).

Advanced age was significantly associated with high tumour grade where 57(58.2%) and 5(5.1%) of high-grade tumours were found in the age groups 65-84 and >84 years, respectively ($p=0.008$), while it was not significantly associated with the muscle-invasion status. On the other hand, both the grade and the muscle-invasion status were not significantly associated with patient gender (Table-2).

Discussion

This is the largest study carried out in Jordan on histopathological features of bladder cancer in relation to patient age and sex. We compared our observations with those of a hospital-based pathology study from northern Jordan¹¹ and other studies from around the world. Our study adds to the knowledge on bladder cancer in Jordan and the region with more emphasis on demographic variations such as age and gender and their impact on important prognostic indicators represented by tumour grade and muscle-invasion status.

Male gender is a well-known risk factor for developing bladder cancer as described in many reports from around the world including our region.^{1,12} The male-to-female ratio in this study was 5.7:1. This was lower than the 9:1 male-to-female ratio reported in the previous study from northern Jordan.¹¹ This change might be due to the fact that cigarette smoking is increasing among Jordanian women. In addition, differences in social factors between northern and central Jordan could impact the ratio significantly. However, the sex ratio in the current study was comparable with a recent study from Saudi Arabia, Pakistan and Iran.¹²⁻¹⁴ This ratio is higher than that of a study carried out in Yemen.¹⁵

Some recent reports demonstrated that female gender is

Table-2: Frequencies of different grades and muscle status of transitional cell carcinoma cases according to patient characteristics.

Criteria	High grade (%) 98 (40.7%)	Low grade (%) 143 (59.3%)	p-value	Muscle-invasive (%) 42 (17.4%)	Superficial (%) 199 (82.6%)	p-value
Age (years)						
<65	36 (36.7%)	76 (53.1%)	0.008	17 (40.5%)	95 (47.7%)	0.681
65-84	57 (58.2%)	66 (46.2%)		24 (57.1%)	99 (49.8%)	
>84	5 (5.1%)	1 (0.7%)		1 (2.4%)	5 (2.5%)	
Gender						
Male	85 (86.7%)	121 (84.6%)	0.396	36 (85.7%)	170 (85.4%)	0.590
Female	13 (13.3%)	22 (15.4%)		6 (14.3%)	29 (14.6%)	

associated with more advanced disease and thus more mortality-to-incidence ratio.⁵ However, our study demonstrated that both the grade and the muscle-invasion status were not significantly associated with patient gender ($p=0.396$ and $p=0.590$, respectively).

Further analysis of transitional cell carcinoma cases revealed that early stage tumours comprised 82.6% of the cases, which is higher than the rate of 71.8% reported in the previous study from Jordan.¹¹ This might be related to improvements in early diagnosis and screening of bladder cancer in Jordan over the last seventeen years.

We found that advanced age was significantly associated with high tumour grade where 57(58.2%) and 5(5.1%) of high-grade tumours were found in the age groups 65-84 and >84 years, respectively ($p=0.008$), while it was not significantly associated with the muscle-invasion status. These findings may indicate that transitional cell carcinoma may present relatively early in advanced age group, and suggest age as an independent risk factor for poor prognosis.

Conclusion

Our results showed that advanced age was significantly associated with higher tumour grade, while patient gender was not significantly associated with tumour grade nor muscle-invasion status. In addition, our study showed significant demographic changes in urinary bladder cancer in comparison to a previous study from northern Jordan. Further genetic and biomarker studies are required to investigate the contribution of these factors in demographic variations in bladder cancer incidence and prognosis.

Disclaimer: None.

Funding Sources: None.

Conflict of Interest: The authors declare no conflict of interest.

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