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Malignant Male Genital Tract and Urinary System Tumours: Tumour Registry Data Analysis at Armed Forces Institute of Pathology, Pakistan (2009-2018)

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ABSTRACT

Objective: To study the frequency and distribution of malignancies of the male genital tract and urinary system.
Study Design: Retrospective longitudinal study.
Place and Duration of Study: Histopathology Department, Armed Forces Institute of Pathology, Rawalpindi Pakistan, from Jan 2009 to Dec 2018.
Methodology: Two thousand four hundred thirteen cases of malignant tumours of the male genital tract and 4278 cases of tumours of the urinary system were extracted from the tumour registry of the Armed Forces Institute of Pathology (AFIP).
Results: Thirty-seven thousand seven hundred ninety-three malignant cases were reported at AFIP from 2009-2018, in which 2413(6.38%) were of the male genital tract and 4278(11.32%) were of the Urinary system. The most frequent tumour out of these was carcinoma prostate 2024(83.8%), followed by tumours of testis 359(14.8%), penis 7(0.3%) and MGT tumours (NOS). In the urinary system, bladder cancers were most frequently seen 3289(78%), followed by kidney tumours 989(22%). Bladder cancer was the top most and prostate cancer was the second most common tumour in males in the seventh decade (60-69 years). Kidney tumours were the third most common in female children in the first decade, following eye and lymph node malignancies.
Conclusion: Carcinoma prostate was the most frequent male genital tract cancer, followed by the testicular tumour. In the urinary system, bladder cancers were most frequently reported with male predominance followed by kidney tumours.

Keywords: Bladder cancer, Male genital tract tumours, Prostate cancer.

How to Cite This Article: *Anwar M, Khadim MT, Asif M, Din H, Jamal S, Chaudary U. Malignant Male Genital Tract and Urinary System Tumours: Tumour Registry Data Analysis at Armed Forces Institute of Pathology, Pakistan (2009-2018). Pak Armed Forces Med J 2022; 72(6): 1867-1870. DOI: https://doi.org/10.51253/pafmj.v72i6.2992*

INTRODUCTION

Urogenital tract cancers are known to run the spectrum regarding age, location, histology and clinical outcome. The incidence of male genital tract cancer, including Prostate, Testicular and Penile cancer, has increased rapidly over a while.[1,2] Prostate cancer is a global burden on the healthcare system, the second most common cancer. It is a frequent cause of cancer death in the US and many Western European countries.[3] The incidence of testicular cancer is lower in the Pakistani population than in western countries. More socioeconomically developed countries, such as western and northern Europe, had a higher incidence of testicular carcinoma but a lower mortality rate than developing countries.[4,5] Malignancies of the penis are rarely reported with an aggressive course, making it 0.4-0.6% of all male malignancies. The prevalence of penile cancer varies according to geographic areas.[6,7] In the United States, penile carcinomas account for only 1% of all malignancies reported annually. However, the frequency is higher in a few areas of South America, Asia, and Africa, accounting for 10-20% of all male cancers reported.[8]

In Pakistan, one of the top ten malignancies in men is urinary bladder cancer, and it is also the most common urological malignancy in both genders. It is the ninth most common malignant disease in the world. In the USA, it ranks fourth among the most common malignancies in men and the 8th in women.[9] The mortality rates of bladder cancers are highest in Western Asia and Northern Africa. Among renal malignancies, Renal cell carcinoma (RCC) is predominantly the disease of the elderly, accounting for 3% of all adult cancers.[10]

The Armed Forces Institute of Pathology (AFIP) tumour registry is one of the largest and oldest institution-based tumour registries in Pakistan, contributing useful information on common malignant tumours in this region. It also provides us with the opportunity to compare the data of AFIP, Pakistan, with national as well as international studies. This study was designed to determine the frequency and distribution of male genital tract tumours and urinary

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Received: 21 Jun 2019; revision received: 10 Dec 2021; accepted: 28 Dec 2021

system malignancies and their changing trends in our population through analysis of the data retrieved from the tumour registry of AFIP.

METHODOLOGY

This retrospective longitudinal study was conducted at Histopathology Department, Armed Forces Institute of Pathology, Rawalpindi Pakistan. We recruited the data of 2413 cases of the malignant male genital tract and 4278 cases of urinary system tumours, which were diagnosed at AFIP from 2009-2018. The data were retrieved from the AFIP tumour registry after approval from Institutional Review Board (Certificate reference number: FC-HSP16-17/READ-IRB/19/521).

Inclusion Criteria: Most cases included were fresh biopsies received, processed, analyzed and reported by AFIP. Biopsies received and reported for second opinions from various centres were also included in this study.

Exclusion Criteria: None

The data was entered on computerized proforma given by Pakistan Health Research Council. Numerical codes were used for coding all the information. An ICD-O code, published by International Agency for Research on Cancer (IARC), was allotted to each tumour. The data were analyzed in terms of patients' age and gender and the tumour site. Total malignant male genital tract and urinary system tumours were calculated each year. Separate data analysis for males, females and paediatric population was done for urinary system tumours. Analysis of these tumours in different decades and comparison with other national and international/regional studies were also done. Statistical Package for Social Sciences (SPSS) version 20.0 was used for the data analysis. Quantitative variables were summarized as Mean±SD and qualitative variables were summarized as (n) and (%).

RESULTS

Malignant cases reported at AFIP from Jan 2009 to Dec 2018 were 37793. Out of those, 22077(58.4%) were males and 15716(41.6%) were females. The total number of paediatric cases reported was 1279(3.38%), of which 820(64%) were males and 459(36%) were female children.

The male genital tract tumour cases were 2413 (6.38%). Prostatic adenocarcinoma was the most frequent in 2024(83.8%) (Table-I).

Table-I: Distribution of Sites of Malignant Tumours of Male Genital Tract (n=2413)

Male Genital Tract	ICD-O	Number (Percentage)
Penis	60-60.9	07 (0.3%)
Prostate	61.9	2024 (83.9%)
Testis	62-62.9	359 (14.8%)
MGT (NOS)	63-63.9	23 (1.0%)

Only 7 cases (0.29%) were diagnosed as penile carcinoma. Testicular tumours constitute the second most frequent malignancy of the male genital tract. The majority of patients with testicular tumours were young. 1134(47%) were <35 years of age, and 21 cases (0.9%) in the paediatric age group were also found. Germ cell tumours were the most frequent type in the pediatric age group.

The tumours of the urinary tract were found in 4278 patients (11.3%); males (n=3624; 85%) outnumber females (n=654; 15%) quite significantly. The tumours of the urinary bladder were most frequent, followed by Kidney tumours. In bladder cancers, the type of biopsy was mostly transurethral resection of bladder tumour (TURBT), which was submitted for histo-pathological examination in the institute. After that, it was urothelial carcinoma, the most common type of tumour. Non-muscle-invasive carcinomas were more frequent than muscle-invasive carcinomas. Most bladder tumour cases, 1734(60%), were seen between 60-80 years of age (Table-II).

DISCUSSION

Urinary bladder malignancies were most frequent among urinary tract tumours in this study of ten years. A similar result was depicted in the study conducted in the USA, revealing the most frequent urinary tract malignancy as bladder cancer, accounting for ~77,000 new cases per annum in the United States.[11]

A comparison of the ten commonest tumour sites in males in further analysis of AFIP data revealed a significant rise in urinary bladder carcinoma cases over the period. In previous data analysis of the AFIP registry (1992-2001) bladder cancer was in the fifth position among the top ten common tumours in

Table-II: Distribution of Most Frequent Urogenital Tumours in Various Age Groups (n=4946)

Site	Age Groups										
	1-9	10-19	20-29	30-39	40-49	50-59	60-69	70- 79	80-89	90+	Unknown
Urinary Bladder (n=2922)	2(0.06)	1(0.03)	34(1.1)	67(2.1)	221(7.4)	560(19.1)	1015(35)	719(25)	258(8.7)	37(1.2)	8(0.3)
Prostate (n=2024)	0	0	25 1.4)	6 (0.4)	25(1.4)	169(8.5)	630(31)	775(38)	324(16)	61(2.8)	9(0.5)

males.[12] However, it becomes the top most common malignancy according to 10-year AFIP data in the next series (2002-2011).[13] persistently being the most common tumour in the present study. These findings are contrary to the results of the Agha Khan University (AKU) cancer registry (2014) which highlighted oral cavity tumours to be the top most common malignancy in south Pakistan.[14]

In AFIP data statistics in the past ten years, prostatic tumours were the most common among male genital tumours and were reported as the second frequency among males. This is comparable with the study.[15] showing prostatic tumours to be the most common (36.67%) among MGT tumours. A similar trend is shown by the Shaukat Khanum tumour registry.[16] As there are a lot of demographic differences between northern and southern parts of Pakistan, including climate, food habits, lifestyle and occupations, this difference might be due to the difference in demographic features. Globally, there is an overall increase in prostatic carcinoma (1.28 million cases) as per the World Health Organisation (WHO) world cancer report of September 2018.[17]

Like other Asian countries, the occurrence of testicular cancer is low in Pakistan compared to the western world. Among testicular tumours, germ cell tumours are most commonly reported. In the US (2001–2005), germ cell tumours accounted for 11.8 per 100,000 males in their third and fourth decades age.[18]

The incidence of renal malignancies significantly differs among the countries of the world. Therefore, owing to the geographic heterogeneity of this tumour, the screening program for high-risk individuals in any region should be planned according to that specific country's incidence and mortality rates. Pathology-based tumour registry being an important public health tool, can be used to demonstrate the emerging incidence variations of urogenital malignancies and can also aid in the initiation of cancer screening programs in our country which are unfortunately still non-existent.

The countrywide population-based cancer registry is not available in Pakistan, the need for which is strongly felt and recommended.

ACKNOWLEDGMENT

We would like to extend immense gratitude to our families for their unflinching support and motivation.

CONCLUSION

The most frequently reported malignancy of the male genital tract was carcinoma prostate, followed by the testicular tumour. In the urinary system, bladder cancer was the most frequent tumour, with male predominance, followed by a kidney tumour, with slight male predominance. Bladder cancer persistently retained the most common position among the top ten reported male malignancies in our population. Kidney tumours were found to be the third most frequent in female children and lay in the seventh position in male children.

Conflict of Interest: None.

Authors' Contribution

Following authors have made substantial contributions to the manuscript as under:

MA & MTK: Conception, Study design, drafting the manuscript, approval of the final version to be published.

MA & HD: Data acquisition, data analysis, drafting the manuscript, critical review, approval of the final version to be published.

SJ & UC: Data interpretation, critical review, approval of the final version to be published.

Authors agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

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