



Current trends in the incidence of Urological malignancy at a tertiary level hospital in the northern part of Bangladesh

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Abstract:

The second most common cause of death is malignancy. In clinical practice, genitourinary tumours are commonly encountered. Urological malignancies are raising due to increasing tobacco consumption, air and water pollution (arsenic, nitrate, chlorinated hydrocarbon) by unbalanced development, unhealthy diet, chronic infection, uncontrolled pesticides & fungicides used, food adulteration, using Chinese herbal products containing aristolochic acid, obesity and longer life expectancy. Over the past few years, advancement of diagnostic imaging, surgical technique, radiotherapy, chemotherapeutics and targeted agents have helped improve treatment outcomes. The incidence of urological malignancies is increasing like other malignancies in Bangladesh, which is poorly addressed. There is generally poor documentation of urological malignancies in Bangladesh. This study was carried out to document the pattern and distribution of urological malignancies in Rajshahi Medical College, Rajshahi, Bangladesh.

Introduction:

The second most common cause of death is malignancy¹. Urological malignancies are increasing with age, and modifiable risk factors partly influence these cancer². In urological pathology, malignancy is important and constitutes a real public health problem as it is increasing^{3,4}. Urological malignancies include cancers of the kidney, ureter, urinary bladder, and urethra in both sex and males and cancers of the prostate, penis, scrotum and testis⁴.

Urological malignancies are raising due to increasing tobacco consumption, air and water pollution (arsenic, nitrate, chlorinated hydrocarbon) by unbalanced development, unhealthy diet, chronic infection, uncontrolled pesticides & fungicides used, food adulteration, using Chinese herbal products containing aristolochic acid, obesity and longer life expectancy.

The incidence of urological malignancies is increasing like other malignancies in Bangladesh, which is poorly addressed. There is generally poor documentation of

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urological malignancies in Bangladesh. This study was carried out to document the pattern and distribution of urological malignancies in Rajshahi Medical College, Rajshahi, Bangladesh.

Improved Knowledge about the incidence of urological malignancies with their pattern can help assess diagnostic measures and the need for the continued promotion of urological cancer screening programs and awareness about prevention. In the case of older people, cancer treatment is challenging due to their comorbidities and fragility⁵.

The study aims to identify the epidemiological and histological features of urological malignancy.

Materials and methods:

This was a descriptive and cross-sectional retrospective study of all histologically proven urological malignancies at Rajshahi medical college hospital (R.M.C.H.) from January 2019 to January 2021.

All records of patients diagnosed with urological malignancies were retrieved from the patient’s registers of the Department of Urology, R.M.C.H.

The urological cancer cases were classified according to the International Classification of Diseases for Oncology (ICD-10). The patient’s biodata, including the patient’s name, age, sex, habit, symptoms, organ involved and type of malignancies, were extracted and analyzed.

The age-standardized incidence rates (A.S.R.s) were calculated for each cancer in patients diagnosed with cancer between January 2019 and January 2001 according to sex and age group (25-49, 50-69, 70 and above). All analyses were conducted by S.T.A.T.A. 14.

As this study employed collected data anonymized for statistical analysis, patients consent regarding ethical consideration was waived.

Results:

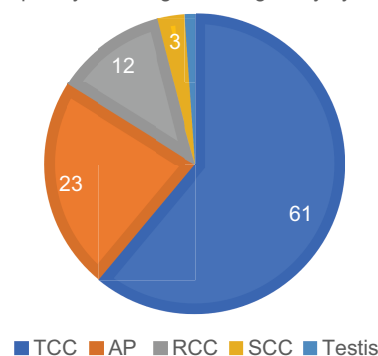
During our study, we collected a total of 238 cases of urological malignancy in the Department of Urology at Rajshahi medical college, Bangladesh, diagnosed by histopathology. The sex distribution of these cancers was male (198) 83.2% and female (40) 16.8%.

Most common cancer is transitional cell carcinoma 146(61%) followed by adenocarcinoma prostate 55(23%), Renal cell carcinoma 29(12%), Squamous cell carcinoma of penis 6(3%) and testicular malignancy 2(1%).

Table I: Frequency of urological malignancy according to types

Type	Frequency	Percentage
Adenocarcinoma of prostate	55	23%
Renal cell carcinoma	29	12%
Squamous cell carcinoma of penis	6	3%
Testicular cancer	2	1%
Transitional cell carcinoma	146	61%
Total	238	100%

frequency of urological malignancy by site



Urological malignancy most commonly affected males, about 198 (83.2%); out of this, T.C.C. is the most common (114) and adenocarcinoma of the prostate in the second position (55).

Table II : Distribution of Urological cancer by cancer site and sex

Sex	Diagnosis						Total No.	Total %
	AP No.%	MGC No.%	RCC No.%	SCC No.%	SM No.%	TCC No.%		
Female	0(0%)	0(0%)	8(27.6%)	0(0%)	0(0%)	32(21.9%)	40	16.8%
Male	55(100%)	1(100%)	21(72.4%)	6(100%)	1(100%)	114(78.1%)	198	83.2%
Total	55(100%)	1(100%)	29(100%)	6(100%)	1(100%)	146(100%)	238	100%

Pearson chi2(5) =17.8651 pr=0.003

Ap, Adenocarcinoma of prostate; MGC, Mixed germ cell tumor of testis; RCC, Renal cell carcinoma; SCC, Squamous cell carcinoma of penis; SM, Seminoma of testis; TCC, Transitional cell carcinoma;

The most common age group is 50 to 69, followed by 70 and above. The most common symptom is hematuria, followed by L.U.T.S.

Table III : Urological cancer according to age group.

Age	AP No. %	MGC No. %	RCC No. %	SCC No. %	SM No. %	TCC No. %	Total No.	Total %
25-49 years	0 (0%)	1 (100%)	11(37.9%)	1(16.7%)	1 (100%)	14(9.6%)	28	11.8%
50-69 years	31(56.4%)	0 (0%)	15(51.7%)	5(83.3%)	0(0%)	80(54.8%)	131	55%
70 and above	24(43.6%)	0(0%)	3(10.3%)	0(0%)	0(0%)	52(35.6%)	79	33.2%
Total	55(100%)	1(100%)	29(100%)	6(100%)	1(100%)	146(100%)	238	100%

Pearson chi2(10) =48.6253 pr =0.000

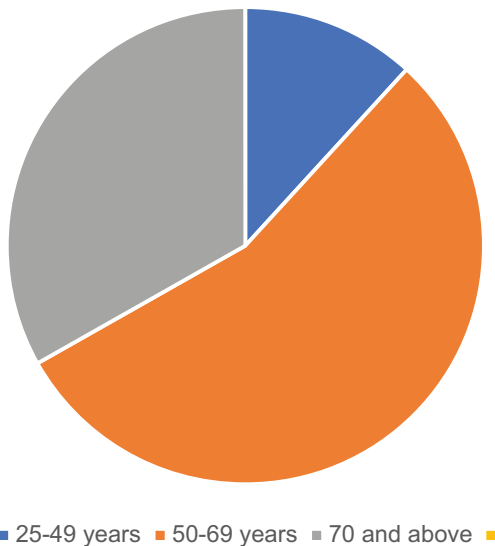
The association between tobacco consumption and urological malignancy is very high (62.2%). But in the case of prostatic malignancy, it is equivocal.

Table IV: Association between tobacco consumption and urological malignancy.

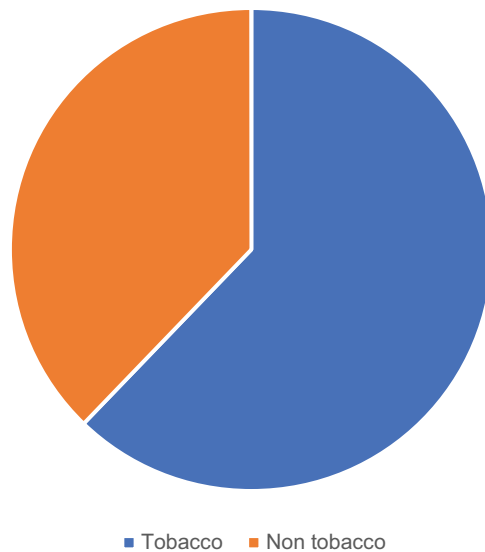
Tobacco consumer or not	AP No. %	MGC No. %	RCC No. %	SCC No. %	SM No. %	TCC No. %	Total No.	Total %
no	31(56.4%)	0(0%)	11(37.9%)	0(0%)	1(100%)	47(32.2%)	90	37.8%
Yes	24(43.6%)	1(100%)	18(62.1%)	6(100%)	0(0%)	99(67.8%)	148	62.2%

Pearson chi2(5) =15.9116 pr =0.007

Relation of aging with urological cancer



Association with tobacco consumption



Cultivator suffers most from urological malignancy followed by business holder.

Table V: Occupational impact on urological cancer.

Occupation	AP No. %	MGC No. %	RCC No. %	SCC No. %	SM No. %	TCC No. %	Total No.	Total %
Business	20(36.4%)	0(0%)	6(20.7%)	0(0%)	0(0%)	36(24.7%)	62	26.1%
Cultivator	25(45.5%)	0(0%)	10(34.5%)	6(100%)	1(100%)	61(48.8%)	103	43.3%
Employee	10(18.2%)	1(100%)	4(13.8%)	0(0%)	0(0%)	18(12.3%)	33	13.9%
House maker	0(0%)	0(0%)	8(27.6%)	0(0%)	0(0%)	31(21.2%)	39	16.4%
Retired person	0(0%)	0(0%)	1(3.4%)	0(0%)	0(0%)	0(0%)	1	0.4%
Total	55(100%)	1(100%)	29(100%)	6(100%)	1(100%)	146(100%)	238	100%

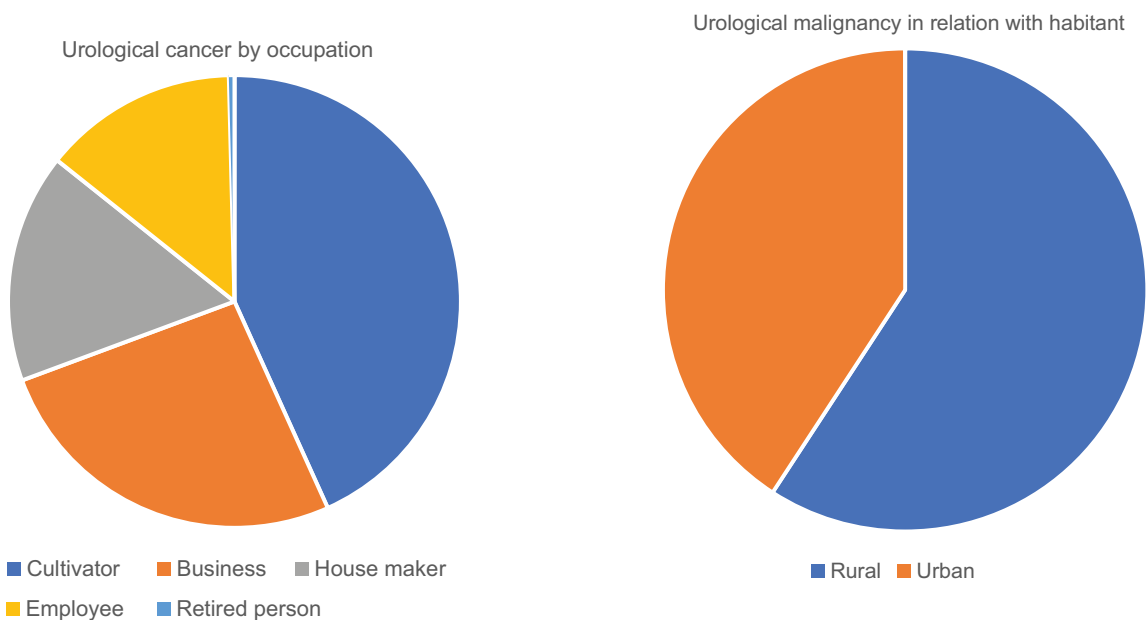
Pearson chi2(5) =40.2013 pr =0.005

Most of them lived in rural areas and cultivators (59.2% and 43.3%, respectively).

Table VI: Urological malignancy concerning inhabitant.

Urban/Rural	AP No. %	MGC No. %	RCC No. %	SCC No. %	SM No. %	TCC No. %	Total No.	Total %
Rural	31(56.4%)	0(0%)	17(58.6%)	5(83.3%)	1(100%)	87(59.6%)	141	59.2%
Urban	24(43.6%)	1(100%)	12(41.4%)	1(16.7)	0(0%)	59(40.4%)	97	40.8%
Total	55(100%)	1(100%)	29(100%)	6(100%)	1(100%)	146(100%)	238	100%

Pearson chi2(5) = 3.7844 pr = 0.581



In this study, the mean prostate age of adenocarcinoma was 68.1 years, creatinine level 1.4 and haemoglobin level 11.6 gm/dl. R.C.C. shows a mean age 51.8 years

creatinine level of 1.2 and haemoglobin level of 11.9 gm/dl. T.C.C. shows mean age 63 years, creatinine level 1.3 and hemoglobin 10.6 gm/dl.

Table VII: Mean and standard deviation of age, creatinine and haemoglobin level.

	Variable	Obs	Mean	Standard deviation
A.P.	Age	55	68.1	9.2
	Creatinine level	55	1.4	0.3
	Hemoglobin level	55	11.6	1.6
MGC	Age	1	32.0	.
	Creatinine level	1	0.9	.
	Hemoglobin level	1	13.6	.
R.C.C.	Age	29	51.8	14.7
	Creatinine level	29	1.2	0.3
	Hemoglobin level	29	11.9	1.9
SCC	Age	6	56.2	7.2
	Creatinine level	6	1.0	0.2
	Hemoglobin level	6	11.7	1.4
SM	Age	1	35.0	.
	Creatinine level	1	0.9	.
	Hemoglobin level	1	14.7	.
T.C.C.	Age	146	63.0	12.1
	Creatinine level	146	1.3	0.4
	Hemoglobin level	146	10.6	1.6

Discussion:

Due to their worldwide frequency, urological malignancies are a real public health problem ². Urological malignancies are remarkably increasing in the ageing population ⁶. It is very difficult to compare the data of developing countries that do not have functional cancer registries with developed countries with high technical support systems and functional cancer registries ^{7,8}. So, the frequency of urological cancers shows significant variations in different parts of the world ⁹. Kidney and bladder cancers show a statically significant positive association with socio-economic deprivation; on the other hand, prostate and testicular cancers show an opposite relationship ¹⁰. Kidney and bladder cancers had a higher incidence rate in rural areas, while prostate cancers were higher in metro areas ¹¹. Some lifestyle habits, such as smoking, physical activity, nutrition, sexual activity and personal hygiene, are modifiable factors influencing the development and progression of urological cancers ¹². In GLOBOCAN 2020, Bangladesh shows prostate cancer ranks 17, bladder cancer 18, kidney cancer 20, ca-penis 27 and testicular cancer 30th position. But in our study, urothelial cancer is the most

common, about 61%. In our study period, urological cancer frequency per year was 119, much higher than in Burkina Faso, where 73 cases per year ⁶, and in Togo, 30.3 cases per year ⁹. In this study, the male-to-female ratio of 4.95 to 1 is similar to that in other study ⁷. But in African countries, males are more preponderance ^{6,13}. In our series, 55% of urological cancers occurred in 50-69 years old, nearly similar to other countries ^{2,6,9}. In this study, most sufferers are from rural areas with a habit of tobacco consumption and occupation by cultivation. Because this part of the country has the least industrial but more agricultural development. Among them, L.U.T.S. and hematuria are the most common presenting symptoms.

Urothelial carcinoma (urinary bladder, ureter, kidney): Urothelial cancer is 4th most common in men and 8th most common in women in the Western world ¹⁴. In Indian data, Genito-urinary systems formed 17.48% of all the cancers in male patients, including carcinoma prostate at 40.71% and urinary bladder cancer at 30.49% ¹⁵. Transitional cell carcinoma (T.C.C.) accounts for 90% of all bladder cancer cases worldwide, 5% of squamous cell carcinoma and the remaining 5% are

rare subtypes like adenocarcinoma, sarcoma and metastatic¹⁶. About 50-65% of all bladder cancers are due to tobacco consumption and 20% to occupational and environmental toxins¹⁶. Bladder cancer is a prime candidate for preventable cancer, with 81% of cases having known risk factors¹⁶. There are many etiological risk factors for bladder cancers, i.e., male gender, older age, hereditary and genetic factors, tobacco, environmental and occupational exposures, alcohol, red meat, obesity, pathogens like Schistosomiasis etc.

A large prospective observational study from Chile suggests that exposure to arsenic increases the risk of bladder cancer¹⁸. Another study from Finland suggests that tobacco consumption and exposure to low concentrations of arsenic (0.5µg/L) synergistically increased bladder cancer¹⁹. Supply water containing disinfection byproducts or nitrates and metals in diet like selenium and zinc also correlated with bladder cancer²⁰. Chinese herbal products containing aristolochic acid, found naturally in many plants belonging to the genus *Aristolochia*, is a potent carcinogen for bladder cancer²¹.

In our study, all the urothelial cancers are transitional cell carcinoma; no other subtypes are detected. But in an Indian study¹⁵, it was 97.71%. Among all the T.C.C., upper tract T.C.C. was seven in number and urethral was three. The male is more preponderant, and the male-female ratio was 3.6:1, similar to China, Togo and the Western world^{1,9,16}. But in India, it was 6.4:1¹⁵ and in Korea 5.68 : 1⁷. In this study, the mean age of diagnosis is 63.0 with a standard deviation of 12.1, similar to other studies^{14, 13, and 16}. But a study from Africa⁹ observes in much lower age group.

Prostate cancer:

According to GLOBOCAN 2020, prostate cancer is the second most common cancer and fifth most common cause of cancer-related mortality in men. But compared to Western countries, prostate cancer is not common in Asia⁷. In our study, prostate cancer is 23% which is 2nd most common urological cancer. This figure is similar to India¹⁵ and China¹. But U.S. cancer statistics: male urologic cancers, December 2020 shows 67% of prostate cancer²², which is much high. In this study, the mean age at diagnosis is 68.1, with a standard deviation 9.2. Interestingly, people who live in rural areas and cultivators suffer more and are non-smokers. Almost 96.4% of patients suffer from lower urinary tract symptoms (L.U.T.S.), and 52.7% have macroscopic or microscopic hematuria.

Kidney Cancer:

Renal cell carcinoma (R.C.C.) is 85% of all Kidney tumours and 3% of all adult cancers¹⁵. The incidence is higher in Europe and North America than in Asia⁷. In our study, R.C.C. is 12%, 3rd most common urological cancer, similar to the U.S.A.²². The mean age of diagnosis is 51.8 with a standard deviation 14.7 which, similar to India's¹⁵, China's¹ and Korea's⁷. In the U.S.A., kidney cancers are more in the younger age group,²³. This may be due to the association with obesity and kidney cancer²⁴. In this study, 72.4% of kidney cancers were found in men who lived in rural areas and smokers were . Hematuria occurs in 58.6% and L.U.T.S. in 31% of patients.

Testicular cancer:

Very rare cancer in the Indian subcontinent, about <1 man per 100000 population¹⁵. But in the U.S.A., testicular cancer is 3% of all urological cancers²². In our study, only one testicular carcinoma was detected: seminoma. The patient was 35 years old, a non-smoker, residing in a rural area and was a cultivator.

Penile Cancer:

The incidence of carcinoma penis depends on various factors like the practice of circumcision, personal hygiene, number of sexual partners, tobacco consumption and human papillomavirus infection. Indian population suffers more from penile cancer¹⁵. In our study, 6 patients were found, all with squamous cell carcinoma. The mean age of diagnosis was 56.2, with a standard deviation of 7.2, and 100% are tobacco consumers. 83.3% lived in rural areas, and by profession, all are cultivators.

Conclusion:

In this study, most urological cancers are urothelial malignancies in the form of transitional cell carcinoma followed by prostate cancer. Most sufferers are the elderly who live in rural areas, tobacco consumers and cultivators. Men had a higher incidence rate than Women. In developed countries, prostate cancer prevalence is high may be due to screening for prostate cancer. But in our country, the prostate cancer screening system is not established. Even though the incidence rate of testicular and penile cancers was found to be low, the absolute number of these cancers may be high as these cancers also deal with by general surgeons in our setting. As most urological cancers are linked with modifiable risk factors, the incidence rate of these cancers can be reduced by improving public

awareness and the healthcare system. Early diagnosis and treatment are the key to improving urological cancer survival.

Conflicts of interest:

There are no conflicts of interest.

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Nil.

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