



CORRELATION OF URINARY CYTOLOGY WITH HISTOPATHOLOGICAL EXAMINATION IN BLADDER TRANSITIONAL CELL CARCINOMA – A 2 YEAR PROSPECTIVE STUDY

Pathology

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ABSTRACT

Introduction: Urinary bladder tumor is the sixth most common tumor diagnosed worldwide. **Aim:** to evaluate urinary cytology of the urine/urinary bladder biopsy samples and to correlate urine cytology with histopathology of bladder neoplasm. **Methods:** study was a prospective hospital-based study including 55 cases attending opd or admitted in the hospital with any genitourinary problems, whose urine sample / urinary bladder biopsy sample/ radical cystectomy specimens were sent to the Department of Pathology, Sardar Patel Medical College and Associated Group of Hospitals, Bikaner, from September 2019 to August 2021. **Results:** Mean age was 59.49 ± 14.58 yr age range (22 – 88 yrs). According to “The Paris System for Reporting” maximum 54.55 % were found negative, 34.55% atypical and 10.90% suspicious for high grade urothelial carcinoma. Out of 32 high grade UCC 13 had shown atypical cells on cytology, 4 Suspicious for high grade and 15 were Negative for high grade. Out of 21 low grade UCC 5 had shown atypical cells on cytology, 2 Suspicious for high grade and 14 were Negative for high grade. Out of 2 papilloma 1 had shown Atypical cells on cytology and 1 was Negative for high grade. There was no association between age and sex with UCC. **Conclusion:** urine cytology is a good tool for diagnosis of patients of bladder cancers.

KEYWORDS

urine cytology, Urinary bladder tumor, histopathology.

INTRODUCTION

Urinary bladder tumor is the sixth most common tumor diagnosed worldwide. It is commonly seen in males in 6th and 7th decade. In India, Bladder cancer accounts for 7% of all cancers in male and 2% of all cancer in female. Cancer bladder is three times more common in men than in women and twice as common among whites as among blacks.¹

Transitional cell carcinoma (TCC) comprises about 90% of all primary tumor of urinary bladder.² The urothelial tumors may be papillary or non-papillary (flat) and invasive or noninvasive.^{3,4}

Urine cytology remains gold standard for bladder cancer screening. Urine cytology is simple, cost effective and noninvasive test. The presence of neoplastic cells in urine was described by Sanders in as early as 1864.⁵ However urinary oncocytopathology gained popularity with the publication by Papanicolaou and Marshall in 1945.⁶ The performance of urine cytology depends on the tumor grade. Its sensitivity is rather high (75%-79%) for detecting high-grade urothelial carcinomas (HGUCs) but is much lower (26%-35%) for the detection of low-grade urothelial carcinomas (LGUCs).^{8,9}

The Paris System working group proposed such a template at the 2013 International Congress of Cytology, which was replete with objective criteria for categorizing specimens into one of the seven categories: non-diagnostic, negative for HGUC, atypical urothelial cells, suspicious for HGUC, HGUC, low-grade urothelial neoplasm and others (including non-malignant entities).^{10,11}

Transurethral bladder biopsy is routinely done for histopathological diagnosis and for assessing the extent of the diseases. Accuracy of diagnosing malignancy in urine cytology varies, and it depends on the presence of diagnostic yield in the urine cytology, processing of the sample and experience of the cytopathologist. Sensitivity of urine cytology is high in a high-grade neoplasm than in a low-grade bladder neoplasm. Cytological findings should always be correlated with detailed clinical information, imaging findings, histopathological findings and immunohistochemistry.¹²

The aim of the present study is to evaluate urinary cytology of the urine/urinary bladder biopsy samples and to correlate urine cytology with histopathology of bladder neoplasm.

METHODS

The study was a prospective hospital-based study including 55 cases attending opd or admitted in the hospital with any genitourinary problems, whose urine sample / urinary bladder biopsy sample/ radical cystectomy specimens were sent to the Department of Pathology,

Sardar Patel Medical College and AG Hospitals, Bikaner, from September 2019 to August 2021.

Ethical committee approval and informed consent of patients were taken. Cases were provisionally enrolled after analyzing inclusion and exclusion criteria and with help of consecutive sampling. Detailed history of all participants was taken. Simple mid-stream, clean catch first morning voided urine sample was taken. Urine volume ranged from 20 mL to 50 mL. Urinary Bladder Biopsy Specimen either TURBT or cystoscopy specimen were taken. All relevant information related to study subjects' socio demographic details, anthropometry, clinical profile was taken. All data collected was entered into Microsoft Excel and were analyzed with help of appropriate software and tests of significance considering level of significance as $p < 0.05$.

RESULTS

Maximum 34.55% were of 61 – 70 yr age group whereas minimum 3.64% were in 31 – 40 yr and 80 – 90 yrs. age group. Mean age of study population was 59.49 ± 14.58 yr. maximum 83.64% were male, 92.72% Hindu, 58.18% were rural population. Most common presentation was hematuria with 60% cases. According to “The Paris System for Reporting” maximum 54.55 % were found negative for high grade urothelial carcinoma followed by 34.55% were with atypical urothelial cell whereas minimum 10.90% were found suspicious for high grade urothelial carcinoma. In our study, according to histology diagnosis, maximum 58.18% were had high grade UCC followed by 38.18% low grade UCC whereas minimum 3.64% had Papilloma.

Table 1 Socio demographic profile

Age group	No.	%
20 – 40	6	7.27
41 – 60	20	12.72
61 – 80	27	
>80	2	
Gender		
Male	46	83.64
Female	9	16.36

Table 2 correlation between histology and cytology

HISTOLOGY	CYTOLOGY			
	NHGUC	SHGUC	AUC	Total
LOW GRADE UCC	14	2	5	21
HIGH GRADE UCC	15	4	13	32
PAPILLOMA	1	0	1	2
P value	0.001*			

In our study, out of 32 high grade UCC 13 had shown atypical cells on cytology, 4 Suspicious for high grade and 15 were Negative for high grade. Out of 21 low grade UCC 5 had shown atypical cells on cytology, 2 Suspicious for high grade and 14 were Negative for high grade. Out of 2 papilloma 1 had shown atypical cells on cytology and 1 was Negative for high grade.

Maximum Low grade UCC 47.61% and high grade UCC 28.12% were in 61 – 70 years age group. There was statistically insignificant correlation between age and urinary bladder neoplasm ($p=0.128$). In male, maximum 63.04% were High grade UCC whereas in female, maximum 55.56% were Low grade UCC. There was statistically insignificant correlation between gender and urinary bladder neoplasm ($p=0.162$).

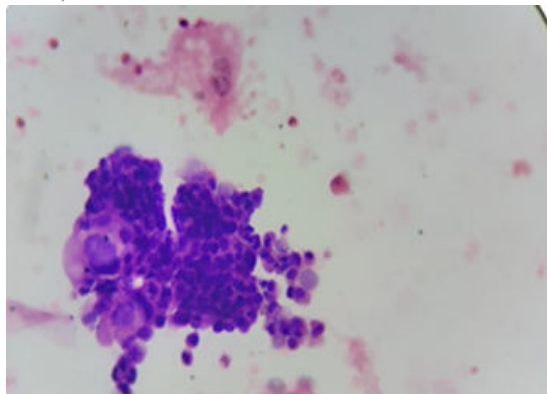


Image 1: Urine Cytology showing cluster of dysplastic cells (H&E, 40x)

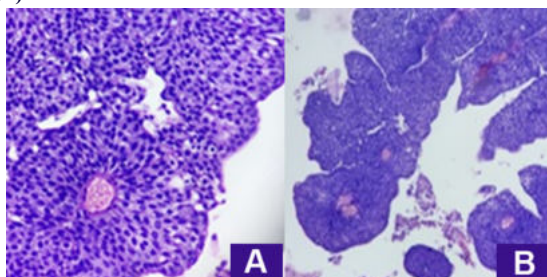


Image 2: (A) tissue section showing transitional cell carcinoma of low malignant potential (H&E, 40x). (B) showing papillary low grade transitional cell carcinoma of bladder (H&E, 10x)

DISCUSSION

The hospital based prospective study for two years on 55 patients, attending OPD or admitted in the hospital with any genitourinary problems, whose urine sample / urinary bladder biopsy sample/ radical cystectomy specimens were sent to the Department of Pathology, Sardar Patel Medical College and AG of Hospitals, Bikaner.

According to “The Paris System for Reporting” maximum 54.55 % were found negative for high grade urothelial carcinoma followed by 34.55% were with atypical urothelial cell whereas minimum 10.90% were found suspicious for high grade urothelial carcinoma. Similarly, **Hassan et al (2016)**¹³ reported the prevalence as 28% NHGUC, 68% AUC, 4.0% SHGUC, LGUN not utilized. Also, **Roy et al. (2017)**¹⁴ examined 18 cases, as 33% AUC, 5.5% SHGUC, 17% HGUC and 28% LGUN, 3 specimens were diagnosed as unsatisfactory. **Wang et al. (2017)**¹⁵ examined 46 cases, they found 70% NHGUC, 24% AUC, 4.3% SHGUC, 2.2% HGUC and LGUN not utilized.

In our study, according to histology diagnosis, maximum 58.18% were had high grade UCC followed by 38.18% low grade UCC whereas minimum 3.64% had Papilloma. Similarly, **Dr. Vijayakumar P et al (2019)**¹⁶ in their study found that 68 cases were confirmed histologically, of which 24 cases of low grade TCC, 44 cases of High grade TCC, only 2 cases are histologically negative. Also, **SKR Vallamreddy et al. (2019)**¹⁷ found that there were 2 cases shown negatives, 16 cases shown Atypical/suspicious, 21 cases shown LG papilloma, and 35 cases shown HGUC.

In our study, out of 32 high grade UCC 13 had shown atypical cells on

cytology, 4 Suspicious for high grade and 15 were Negative for high grade. Out of 21 low grade UCC 5 had shown atypical cells on cytology, 2 Suspicious for high grade and 14 were Negative for high grade. Out of 2 papilloma 1 had shown atypical cells on cytology and 1 was Negative for high grade. Similarly, **SKR Vallamreddy et al. (2019)**¹⁷ in their study found that in HGUC group, out of 35 cases, 27 cases were turned out to be HGUC with 77.14%. In HGUC group, out of 35 cases, 8 cases were turned out to be LGUP with 29.62%. Also **Dr. Vijayakumar P et al (2019)**¹⁶ showed similar results.

Maximum Low grade UCC 47.61% and high grade UCC 28.12% were in 61 – 70 years age group. There was statistically insignificant correlation between age and urinary bladder neoplasm ($p=0.128$). Similarly, **SKR Vallamreddy et al. (2019)**¹⁷ in their study found that there was no statistical significance among the age groups and urinary bladder neoplasm. Also, **Naveen Chawla (2020)**¹⁸ showed that bladder tumors were commonly seen with average age of presentation being the sixth decade.

In male, maximum 63.04% were High grade UCC whereas in female, maximum 55.56% were Low grade UCC. There was statistically insignificant correlation between gender and urinary bladder neoplasm ($p=0.162$). similarly, **SKR Vallamreddy et al. (2019)**¹⁷ in their study found that there was no statistical significance between male and female genders and urinary bladder neoplasm. Also, **Naveen Chawla (2020)**¹⁸ showed that bladder tumors were commonly seen in males.

CONCLUSION

The present study shows that urine cytology is a good tool for diagnosis of patients of bladder cancers. Sensitivity of urine cytology is high in high grade neoplasm than in low grade bladder neoplasm. Cytological findings should always be correlated with histopathological findings.

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