Original Research Paper

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Urology

A PROSPECTIVE STUDY ON COMPARISON OF URINARY CYTOLOGY WITH HISTOPATHOLOGICAL EXAMINATION IN BLADDER TRANSITIONAL CELL CARCINOMA

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ABSTRACT

Introduction : Bladder cancer accounts for 7% of all cancers in male and 2% of all cancers in female. Urinary cytology has prominent role in the multidisciplinary diagnostic approach to bladder cancer. It is used as a valuable adjunct to cystoscopy and biopsy for diagnosis and follow up of patients with bladder cancer. Urine cytology remains gold standard for bladder cancer screening. It has high specificity but low sensitivity for both high-grade and low-grade tumors.

Materials and Methods: A prospective study conducted from 2016-2018. Inclusion criteria was patients with carcinoma of bladder diagnosed radiologically. Urine cytology was done in all cases preoperatively and correlated with histopathology post operatively.

Results : In our Prospective study, 70 patients were included those who are presented with LUTS due to Bladder TCC detected by ultrasound. Age of patient ranged from 40 to 89 .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. Out of 68 cases of histologically proved TCC, 52 cases were correctly diagnosed by urine cytological examination. histological confirmed TCC occur in 68 patients on which patients 76% were diagnosed cytologically

Conclusions: Cytology still considered a useful tool in the diagnosis and follow-up of Ca bladder (TCC) with a good sensitivity and high specificity

KEYWORDS : Urine cytology, TCC, HPE, LUTS

INTRODUCTION

Bladder cancer accounts for 7% of all cancers in male and 2% of all cancers in female. Urine cytology remains gold standard for bladder cancer screening. It has excellent specificity with few false positive cases.Urine cytological examination is a simple, safe, and inexpensive method to detect hidden urothelial tumours & used as a valuable adjunct to cystoscopy and biopsy for diagnosis and follow up of patients with bladder cancer Cystoscopy remains the standard for the diagnosis and surveillance of bladder tumors, allowing the lesions to be mapped and sampled. Urine cytology can detect bladder tumor before it can be detected cystoscopically. Urine cytology remains as a gold standard for bladder cancer screening. All Ultrasound detected bladder neoplasm will be screened by urine cytology collected randomly. Urine cytology will be corroborated with histopathological examinations

AIM

1. To Correlate Urine cytology with Histopathology of the Bladder Transitional Cell Carcinoma.
2. To Study the Role of Urinary Cytology in the diagnosis of Bladder Transitional Cell Carcinoma.
3. To Find out the Correlation between the Grading by Urine cytology and Histopathology.

MATERIALS AND METHODS

Prospective clinical study done on 70 Patients admitted in Department of Urology, Madurai medical college from January 2016 to December 2018, in coordination with Department of Pathology , patients presented with lower urinary tract symptoms (LUTS) due to bladder transitional cell carcinoma detected by ultrasonography

Freshly voided urine samples are collected usually 3 hours after first morning void. Samples are immediately mixed with 95 % alcohol and kept in refrigerator till centrifuged. Approximatedly 100ml of urine are centrifuged at 2500 revolution/min for 20 min. Multiple smears are prepared from sediment and slides are fixed in 95% alcohol immediatedly. Smears are stained with papanicolaou stain and haematoxylene and eosin stain. Interpretation of exfoliative cytology of urinary sediments are classifieds as Negative, Atypia, Suspcious, Positive.

Cystoscopy was performed in all patients using rigid cystoscope and details of growth are noted. Material was obtained from TURBT biopsy , Radical Cystectomy specimen. Biopsies taken are processed routinely and 3-5 u thick sections are cut. H & E Staining was done on tissue section for morphological evaluation & lesions are histologically classified as Low grade, High grade & No malignancy.

Inclusion criterias are patients with Bladder Neoplasms detected by ultrasound & Symptomatic patients with LUTS and hematuria

Exclusion criteria are patients who already undergone biopsy & Other causes of Hematuria like RCC, Upper tract TCC

RESULTS

70 patients of urinary bladder neoplasms diagnosed by ultrasonography were studied for comparative evaluation of urinary cytology with Histopathological correlation .

TABLE 1: URINE CYTOLOGY

URINE CYTOLOGY RESULTS	NO OF CASES
POSITIVE	44
SUSPICIOUS	8
ATYPICAL	4
NEGATIVE	14

TABLE 2: COMPARISON OF HISTOLOGY WTIH URINARY CYTOLOGY

HISTOLOGY	CYTOLOGY		TOTAL
	POSITIVE	NEGATIVE	
LOW GRADE	16	7	23
HIGH GRADE	36	9	45
NEGATIVE	0	2	2
TOTAL	52	18	70

TABLE 3: COMPARISON OF URINARY CYTOLOGY WITH TUMOUR STAGING

URINE CYTOLOGY	PTa,	PTis	PT1	PT2 & Above
Positive	4	15	12	21
Negative	6	6	2	4
Total	10	21	14	25

TABLE 4: ULTRASONOGRAPHIC FINDINGS

TYPE OF LESION	NO OF CASES	PERCENTAGE
Hypoechogenic	44	60%
Mixed Echoic	16	17%
Hyperechoic	6	8%

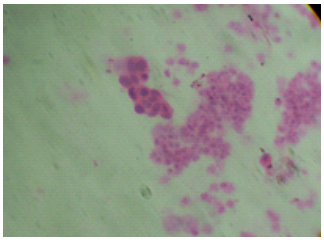
Isoechoic	4	5%
Total	70	100%

Accuracy Statistics

Histological Diagnosis	Positive	Negative	Total
Urine Cytology +ve	52	0	52
Urine Cytology -ve	16	2	18
Total	68	2	70

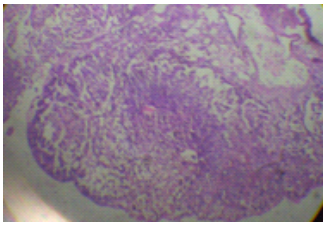
Accuracy Statistics	
Sensitivity	96%
Specificity	26%
Positive Predictive Value	76.5%
Negative Predictive Value	90%
Likelihood Ratio +ve	1.13
Likelihood Ratio -ve	0.00
Diagnostic Effectiveness	0.77
Prevalence	0.74

CYTOLOGICAL PICTURE



Urine sediment smear of low grade TCC

HISTOLOGICAL PICTURE



Histology of high grade papillary TCC

DISCUSSION

Urine cytology is a non invasive method of detection, diagnosis and follow up of bladder transtitional cell carcinomas. Urine cytology involves exfoliated cells from lining of urinary tract . Urine cytology relies on neoplastic cells being shed in urine. High grade tumours like CIS are more likely to shed abnormal cells into urine. Sensitivity rates are higher for high grade tumours. Low grade tumours are less likely to shed cells into urine and less sensitivity. False positive due to stones infections, instrumentation and chemo/radiotherapy .

Urine cytology is used for diagnosis of clinical symptomatic patients, detection of tumours in high risk patients those who exposure to industrial chemicals, smoking. Cytology only complements, does not replace cystoscopy and biopsy. Cytology useful in detection in small or hidden lesions like diverticulum, ureters, renal pelvis, urethra. Incidence of urothelial carcinoma increases, so demand for urine cytology increases. Clinical history is important to minimse false positive . urine cytology sensitivity increases with grade of tumour.

To conclude that sensitivity of urine cytology was 96% where as specificity was 26% . Sensitivity for high grade tumous was higher than low grade tumours. Its Diagnostic Significance, Sensitivity of Urine Cytology study findings is High, meaning that malignancy +ve test result often occurs in those with malignancy. Specificity of Urine Cytology study findings is extremely low, meaning that malignancy –ve test very rarely occurs in those without malignancy.The PPV of Urine Cytology study findings are modest, meaning false positives are little common in those who screen positive. The NPV of Urine Cytology study findings is very high, meaning false negatives are rare in those who screen negative.

Our study shows that cyto- histological correlation was 76%. Although specificity for urine cytology is low, its high sensitivity shows still a valuable tool in diagnosis of bladder carcinoma, where newer modalities have not yet been established. Larger studies may be required to better study specificity and sensitivity of urine cytology

CONCLUSION

Cytological examination of urine specimen is valuable as an aid in the diagnosis of bladder tumors.Voided urine cytology correlates with histological diagnosis in more than 60% of cases. The accuracy is more with high grade tumors Urine cytology grading correlates in most cases with histopathological grading.

The voided urine cytology is not only of diagnostic, but also of prognostic value; positive cytology of high grade presumably identifies patients at high risk for high grade and invasive tumours.Cystoscopy is essential in diagnosing low grade tumors which were mostly missed by voided urine cytology. Voided urine cytological study can be a valuable adjunct to the clinician in the evaluation of suspected urothelial malignancy, as it is simple, non-invasive and with good accuracy in the diagnosis of TCC

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