



Research Article

CYTOMORPHOLOGICAL STUDY OF URINE: A TERTIARY CENTER STUDY

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ABSTRACT

Aim:(i) Cytological examination of urine received in the department of pathology, RIMS (Rajendra Institute of Medical Sciences)Ranchi.(ii)An attempt to establish the cause of the urine abnormalities .(iii) To establish etiological cause of urine abnormalities with respect to age group distribution. **Material and Method:** The smears were prepared using conventional centrifugation techniques & stained with hematoxylin & eosin/Papanicaloau stains .Then the smear were studied to see cell morphology &pattern. **Result:** Out of 110 urine samples of majority of the cases belonged to inflammatory condition (59/110) samples,(10/110) samples were malignant while(41/110) samples were normal. **Conclusion:** The study of exfoliated cells in urine cytology can be used as a routine diagnostic procedure and the techniques used for processing urine are easy to perform in any laboratory set up. The technique like conventional centrifugation help in better morphological interpretation; therefore the need to reconfirm its utility in diagnostic cytology.

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INTRODUCTION

Exfoliative cytology of urine is based on voided urine, bladder washing or brushings of the epithelial surface¹. Urine cytology help us to diagnose urinary tract abnormalities. It is similarly used for the detection of primary and recurrent urothelial carcinoma^{2,3},as well as in many other diseases related to the urinary system such as urinary schistosomiasis⁴and bacterial infection⁵.Urine cytology has variable sensitivity and specificity depending on the sample collection methods and tumor grade in the case of malignancy^{6,7,8}.Although the determination of cell morphology through microscopy remains the gold standard⁹,false positive and negative result have been reported. The false-positive results from urine cytology may be attributed to the presences of viral infection, such as polyomavirus. False negative results have been linked to the sampling method used, the number of the samples obtained from the patient and the volume of the urine being processed^{2,7-11}.Urothelial carcinoma is one of the most commonly reported cancers¹².

MATERIAL AND METHODS

Source of data: Urine samples obtained from patients of various departments of RIMS Ranchi-General medicine, pediatrics, Generalsurgery, urology and others. Inclusion criteria was all urine samples come in pathology department of RIMS for examination from all department.

Sample collection

Voided urine: Mid-morning/random specimen is recommended. The sample should be quickly sent to the laboratory for processing .If a shorter delay is unavoidable the container may be placed in the refrigerators, if the delay is longer, alcohol should be added to the sample to fix the cells.

Catheterized specimens: Collected only when clinically indicated because it is an invasive procedure. This method avoids contamination, cells are well preserved but the sheets of epithelial cells dislodged at the tip of the catheter and mimic papillary neoplasia.

Bladder washings: Performed by irrigating the bladder with saline or electrolyte solution and sending the lavage specimen to the laboratory.

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Brushings: Carried out with a cystoscope, epithelial cells are removed with a brush, smeared on to the slides and sent to the laboratory.

Sample fixation: Urine 3 consecutive urine samples will be collected only from patients with suspected urothelial tumors (the first sample will be an early morning sample)

Method of fluid processing

Conventional fluid processing by centrifugation

- Around 5 ml of samples was taken and placed in a test tube for centrifugation.
- It is centrifuged at 2000 rpm for 10 min.
- The supernatant fluid was pipette out and the cell button was smeared, stained with haemotoxylin and eosin/Papanicaloau stains.

RESULT

The following observations were made in this study on urine: I.A total of 110 urine samples were examined, of them 80(72%) were males and 30(27%) were females.

Table No 1

Total Urine Sample	Male	Female
110	80(72%)	30(27%)

Age distribution: Patients were grouped according to their ages into 3 groups;(i) <30 years, (ii) 30-60 years and (iii)>60 years.

Table No 2

Age category	No of cases observed	Percentage
<30 years	15	13.63%
30-60 years	60	54.54%
>60 years	35	31.81%

Age and sex distribution with regards to samples

Table No 3

Age	Male	Female	Total
<30 years	32	9	41
30-60 years	30	13	43
>60 years	18	8	26
TOTAL	80	30	110

Of the 110 cases examined, 10 were positive for malignancy, 60 were inflammation and 40 were normal cases.

Table No 4

Predominant Cytological Pattern	No of Cases	Impression
Pleomorphics cells	10	Carcinoma
Numerous polymorphs,histiocytes	59	Inflammation
Morphologically normal cells	41	Normal

DISCUSSION

Cytology examination of urine yields important information with sensitivity for low grade cancers ranging from 13-75%¹³ and from 70-80% for high grade malignancies. The present study included 110 samples of urine examination and malignancy was detected in 10/110 samples. All the samples sent for examination were to exclude malignancy.

Bots *et al* in 1964 reported that malignant cells were detected cytologically in 16/31 cases with histological confirmed tumors or leukemia affecting the central nervous system. They could identify tumour type in 13/16 positive cases¹⁴.

Cytology examination of not only body fluids but urine also yields important diagnostic information. Koss and associated in a study of cytological examination of voided urine in 183 patients with suspected tumors reported an overall sensitivity rate of 82%¹⁵

CONCLUSION

Urine cytology is a safe, non invasive and reliable diagnostic tool identifying neoplastic as well as inflammatory conditions of urine and deserves more widespread use in the monitoring of patients, especially those with renal transplants.

In our study 110 urine samples was carried out and the smears were evaluated by conventional centrifugation methods. Out of which 10/110 samples were malignant,59/110 samples were inflammatory and 41/110 samples were normal .The male to female ratio in the overall study was 2.66:1.

It now seems that urine cytology needs to be implemented in clinical setting for the benefit of patients and urologists.

The present study reconfirms and highlights its utility in diagnostic cytology.

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References

1. Koss LG and Melamed MR (Eds.). Koss' Diagnostic cytology and its histopathology bases.5th edition, Philadelphia: J B Lippincott Company, 2006:pages: 744.
2. Raab SS, Grzybicki DM, Vrbin CM, *et al.*: Urine cytology discrepancies: frequency, causes, and outcomes. *Am J Clin pathol.* 2007; 127(6):946-53.
3. Barlandas-Rendon E, Muller MM, Garcia-Latorre E, *et al.*: Comparison of urine cell characteristics by flow cytometry and cytology in patients suspected of having bladder cancer. *Clin Chem. Lab Med.*2002;40(8):817-23.
4. Bellafiore S, Zanichelli M, Piana S: Schistosoma haematobium in urine cytology: Diagnosis is possible. *Am J Med.* 2018; 131(3):e87-e88.
5. Cheung F, Loeb CA, Croglia MP, *et al.*: Bacteria on Urine Microscopy is Not Associated with Systemic infection in patients with Obstructing Urolithiasis. *J Endourol.* 2017; 31(9):942 -945.
6. Murphy WM: Current status of urinary cytology in the evaluation of bladder neoplasms. *Hum Pathol.*1990; 21(9):886-96.
7. Murphy WM, Soloway MS, Jukkola AF, *et al.*: Urinary cytology and bladder cancer. The cellular features of transitional cell neoplasms.*Cancer.*1984; 53(7):1555-65.
8. Rosenthal DL, RaabSS: Cytologic detection of urothelial lesions. Springer; 2006.
9. McIntire PJ, Khan R, Hussain H, *et al.*: Negative predictive value and sensitivity of urine cytology prior to implementation of The Paris System for Reporting

- urinary cytology. *Cancer Cytopathol.*2019; 127(2):125-131.
10. Paez A, Coba JM, Murillo N, *et al.*: Reliability of the routine cytological diagnosis in bladder cancer. *Eur Urol.*1999; 35(3):228-32.
 11. Geva GA, GielchinskyI, Aviv N, *et al.*: Urine cell-Free microRNA as biomarkers for transitional cell carcinoma. *BMC Res Notes.*2017; 10(1):641.
 12. Siegel R, Ma J, Zou Z, *et al.*: Cancer statistics, 2014. *CA Cancer J Clin.*2014; 64(1):9-29.
 13. Reagan JW. Exfoliative Cytology of pleural, Peritoneal and PericardialFluids. *Cytologyseries.* The institute of pathology, Western Reserve University and University Hospital. Cleveland, Ohio: 153-158.
 14. Bots GT Went LN, Schaberg A. Results of sedimentation technology for cytology of cerebrospinal fluid. *Acta Cytol* 1964; 8:234-241.
 15. KossLG, Deitch D, Ramanathan R. Diagnostic value of cytology of voided urine. *Acta Cytol* 1985; 29:810-816.

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