

Screening of urine sample in persons with haematuria for atypical cells in diagnosing urinary tract malignancy

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Abstract

Background: Urine cytology is the most non-invasive technique used in diagnosis of urinary bladder cancers for early treatment and intervention.

Aims: The present study was undertaken to study the role of urine cytology in evaluation of hematuric patients for diagnosing malignancy.

Materials and Methods: 7000 fresh urine samples received over a period of 2 years at our hospital were included in the study. 2000 cases had hematuria and were examined under the microscope for atypical cells.

Results: 500 cases (25%) out of 2000 hematuria cases had atypical cells. 120 cases (6%) had malignancy both on cystoscopy and cyto-pathologic examination. 150 cases (30%) were reactive in origin, because of instrumentation or foreign bodies. 1230 cases (61.5%) were negative for atypical cells/malignancy.

Conclusions: Urine cytology as first line of investigation is of limited clinical value in patients with hematuria for detection of atypical cells and urinary bladder malignancies.

Keywords: Atypical cells, Hematuria, Malignancy, Urine cytology.

Introduction

Examination of urine is among the oldest medical procedures in the history of mankind. Ancient Egyptians were aware of the importance of bloody urine in the diagnosis of bladder disorders that were later identified as cancer caused by the parasite *Schistosoma haematobium*. The gross inspection of urine (often collected in special containers) or "uroscopy" was an important diagnostic procedure for many centuries⁽¹⁾. The problem with cytology of the urinary tract is the lack of basic understanding of the accomplishments and limitations of the method and of the pathologic processes accounting for it. It is unrealistic to expect that cytology of urine, or of the various ancillary sampling procedures, will help in differentiating low-grade papillary tumors from other space-occupying lesions of the renal pelvis or ureter⁽²⁾. Urine cytology is less expensive, simple and safe method to detect urinary bladder tumors in persons with hematuria⁽³⁾. Urine cytology is mainstay for early detection and diagnosis of malignancy in hematuric persons⁽⁴⁾.

Materials and Methods

7000 fresh urine samples received at our hospital in Navodaya Medical College, Raichur in 2 years (2012-2014) were included in the study. 2000 cases had hematuria and urine samples were examined under the microscope for detecting atypical cells.

Fresh morning urine samples were collected in a sterile urine container.

Urine samples were grossly examined including the physical and chemical examination. Physical examination was done for hematuria and chemical examination was done by urine dipstick method for detection of sugar, ketone bodies, blood and pH. Urine samples were centrifuged in a table top centrifuge at 1000 RPM (Rotations Per Minute) for 5 min and sediments were made. For the wet mount examination the sediment at the bottom of tube was transferred onto a glass slide, cover slipped and evaluated under the microscope. The urine sediment was also used to make Giemsa stained smears for cytological evaluation.

Results

The patients were between 40 and 70 years of age. 2000 samples were hematuric on gross examination. Out of these 1400 (70%) were males and 600 (30%) females. 500 cases (25%) had atypical cells on cytological examination. 120 cases (6%) had malignancy both on cystoscopy and cytopathologic examination. 150 cases (30%) of 500 cases with atypical cells were of reactive origin, because of instrumentation or foreign bodies. 1380 cases (69%) were negative for atypical cells/malignancy. The cytologic features in the malignant atypical cells were presence of high nuclear and cytoplasmic (N/C) ratio and nuclear pleomorphism. Negative cases for malignancy had features of cystitis, acute inflammation and benign pathology on cytologic evaluation.

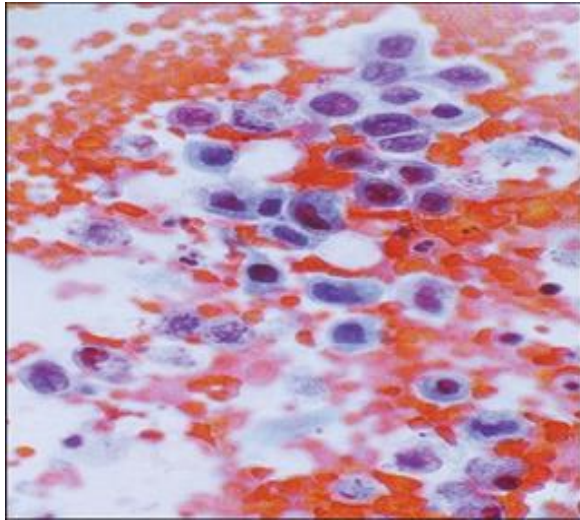


Fig. 1: Atypical cells in Urine (X400)



Fig. 2: Malignant cells in Urine (X400)

Discussion

Many gross hematuria cases detect urinary bladder cancers while few patients with bladder cancer have asymptomatic microscopic hematuria which are positive for malignancy on urine cytology⁽⁵⁾. Diagnosis of urinary bladder cancer can be made by cystoscopy, biopsy and urine cytology. Urine cytology is a non-invasive technique which helps in screening and diagnosis⁽⁶⁾.

Urine cytology can detect cases of low grade non-invasive tumor, carcinoma in situ and aggressive invasive neoplasms. Principle in urine cytology is that more the grade of the tumor, the more accurate the diagnosis^(7,8). Patients with negative cytological findings have a low risk of recurrence, while those with high grade cytological abnormalities have an aggressive tumor course⁽⁹⁾.

Urine cytology is also a good indicator for presence of urothelial atypia, and indicator for bladder washes and mucosal biopsies⁽¹⁰⁾.

Many urinary bladder lesions can lead to detachment of transitional cells which include stones, infection, surgical instrumentation, trauma and inflammation and hence false positive diagnosis are rendered on urine cytology compared to other techniques. In addition, transitional epithelial cells can show variation in size and shape, nuclear and cytoplasmic degenerative changes that can mimic tumor^(11,12). A negative cytology may be there in urothelial malignancy. Reasons are unsuitable environment for cells and degeneration of tumor cells⁽¹³⁾. According to the American Urological Association, urine cytology is done only for patients who are at risk for Transitional Cell Carcinoma. It is a good tool for screening in middle aged and elderly patients⁽¹⁴⁾.

Conclusion

Urinary cytology is non-invasive and inexpensive method for detecting urothelial malignancies. The reliability when compared to other techniques is less even with the experts, perhaps due to lack of uniformity in reporting formats. These deficiencies can be overcome to a great extent if both the clinicians and the cyto-pathologists work in collaboration with each other.

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