RESEARCH ARTICLE

URINARY CYTOLOGY AND ITS CORRELATION WITH BLADDER CARCINOMA

*Dr. Mahasweta Mallik, Dr. Sujata Mallick, Dr. Puskar Shyam Chowdhury and Dr. Richa Madhawi

c/o Dr. Hrishikesh Mallick, Chandchati, Sweetheart Lane, Chuck-Mussallapur, Patna-800006, India

ABSTRACT

The best method to confirm diagnosis of carcinoma of urinary bladder is cystoscopy and biopsy. Urine cytology is a non-invasive method of detecting carcinoma bladder. We aimed to evaluate the sensitivity and specificity of urine cytology to detect bladder carcinoma as a screening test. All patients with suspicion of carcinoma bladder with risk factors like increased age, symptoms of painless haematuria, dysuria and frequency attending the Urology out-patient department (OPD) of Patna Medical College and Hospital over a period of 3 years were screened. A total of 80 symptomatic patients were screened by cytology. 55 cases revealed abnormal cells in urine cytology. Out of these patients, 28 patients underwent cystoscopy and biopsy when deemed necessary. 13 cases of bladder carcinoma were diagnosed and confirmed by biopsy. Urine cytology was positive in 61.5% cases.

INTRODUCTION

Bladder carcinoma is the 2nd most common tumour of the urinary system (Robbins *et al.,* 2014). Risk factors for carcinoma bladder include: A) cigarette smoking, b) industrial exposure to arylamines, c) Schistosoma Haematobium d) long term use of analgesic e) exposure to cyclophosphamide (Robins *et al.,* ?). George Pananicolaou and Marshall in 1940s popularised the examination of urine for the diagnosis of bladder carcinoma (Bastacky 1999). It has been observed that high grade bladder carcinoma can have sensitivity as high as 98% (Despande 2005). But low grade carcinoma can have sensitivity as low as 8.5%. This study is an attempt to determine the sensitivity and specificity of urine cytology to screen for bladder carcinoma.

MATERIALS AND METHODS

80 cases of suspected bladder carcinoma were screened with urine cytology over a period of 3 years from May 2011 to June 2014 in Patna Medical College and Hospital (PMCH) and other hospitals in Patna. Suspicion was based on increased age, haematuria, dysuria and frequency. Out of these 80 cases, 28 reported back for cytology, ultrasonography and biopsy. The age group was between 52-78 years with mean age 64 years. Both male and female was included in the study with male to female ratio 4:1.

*Corresponding author: Dr. Mahasweta Mallik,
c/o Dr. Hrishikesh Mallick, Chandchati, Sweetheart Lane, Chuck-Mussallapur, Patna-800006, India.

Table 1. Presenting symptoms of the 28 cases

Symptoms	Number of patients (n=28)	percent
Haematuria(painless)	24	86%
Haematuria+dysuria+frequency	4	14%

Freshly voided urine sample were collected and centrifused for three consecutive days. Urine samples were taken prior to any intervention like catheterisation or cystoscopy as instrumentation can lead to false positive results (Kapur 2008). The specimens were stained by papanicolaou stain and examined under microscope for malignant or atypical cell. Microscopic picture was interpreted as: Cystitis- degenarated urothelial cells with vacuolated cytoplasm, some reactive urothelial cell,and polymorphs and RBCs. Calculi-cluster of transtitional cell in pseudopapillary groups, reactive urothelial cells and RBCs and polymorphs. Papillary urothelial carcinoma low grade- irregular papillary cluster with peripheral palisading. Nuclear eccentricity with increased Nuclear-Cytoplasmic (N/C) ratio, irregular nuclear counter and cytoplasm homogenicity without vacuolation. Fragmented nuclei and cell cannibalism can be present. Papillary urothelial carcinoma high grade- loose clusters of large number of cells with high N/C ratio, marked nuclear enlargement, hyperchromasia and nuclear membrane irregularity, large nucleoli, anaplasia, atypical mitosis and necrosis.
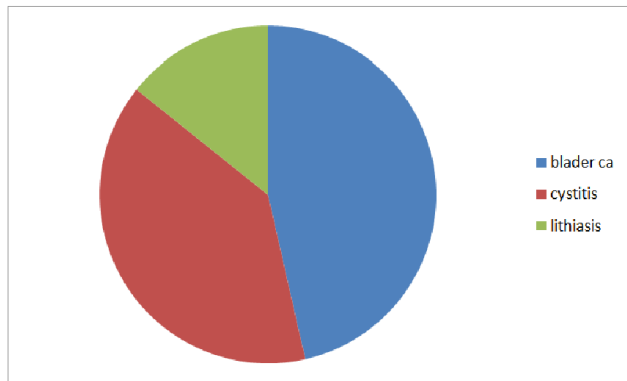
RESULTS

Out of the 28 cases 13 cases were later proved by biopsy to be suffering from bladder carcinoma.

Table 2. showing the result of the 28 cases

| Cases	Number	Percent
Bladder carcinoma	13	46.42%
Cystitis	11	39.28%
Urolithiasis	4	14.28%

Pie chart 1: showing the percentage of bladder carcinoma in the 28 cases

Table 3. Showing the distribution of bladder carcinoma

grade	biopsy	cytology	% positive in cytology
High grade urothelial carcinoma	7	6	85.71%
Low grade urothelial carcinoma	6	2	33.33%

Pie chart 2: showing percentage of urinary positive cases.
1-positive by urinary cytology-61.53%
2-negative by urinary cytology-38.47%
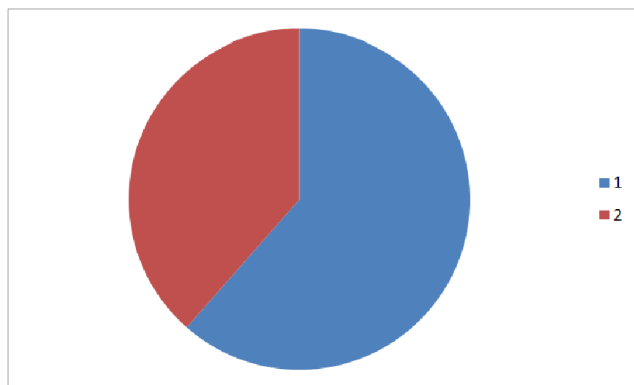
The sensitivity of urinary cytology in diagnosing bladder carcinoma in this study is 61.53%. In diagnosing high grade urothelial carcinoma the sensitivity is 85.71% and in low grade urothelial carcinoma the sensitivity is 33.33%.

DISCUSSION

Urinary cytology sensitivity varies according to the grade of carcinoma and collection method (Raab *et al.,* 2007). False positive results can be due to increased exfoliation of cell due to instrumentation, stone, previous chemotherapy, inflammatory diseases and benign prostatic hypertrophy (Despande *et al.,* 2005; Kapur *et al.,* 2008). False negative can be due to the presence of low grade carcinoma (Raab *et al.,* 2007). In our study sensitivity was 61.53% for all bladder carcinoma and with high grade bladder carcinoma sensitivity was as high as 85.71%. Variation in sensitivity can be due to inter-observer variability among cytopathologists. Hyperchromasia, nuclear pleomorhism and nuclear membrane irregularities were most consistently observed in malignant atypical cells (Raab *et al.,* 1994; Raab *et al.,* 1996). The present study also showed these findings more frequently in malignant cases.

Conclusion

In spite of advancement of ancillary technique for the diagnosis of urothelial carcinoma, urinary cytology is still an important non invasive technique for screening, diagnosis and follow up of bladder carcinoma.

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