

ORIGINAL RESEARCH

To evaluate the diagnostic usefulness of combining cystoscopy and urine cytology in the diagnosis of urothelial neoplasia

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ABSTRACT

Aim: The purpose of this study is to evaluate the diagnostic usefulness of combining cystoscopy and urine cytology in the diagnosis of urothelial neoplasia. **Material and methods:** One hundred patients with hematuria from the urology outpatient department and the inpatient ward were recruited for the research. These patients might be of any age or gender. Individuals who had a history of prostatism, abdominal mass, urinary tract infection, anorexia, or weight loss, as well as proteinuria, were not allowed to participate in the trial. **Results:** Urine cytology results were scored, and cases were ranked from 0 to 5 on a scale from most severe to least severe. Throughout the course of our research, there were seven individuals who fell into category 0 (Inadequate or no specimen), since their smears had only a small number of degenerated cells and did not have a sufficient number of urothelial cells. Patients fell into group 1 in 73 (73%) of the cases (benign). No cases met the criteria for category 2 (atypical probably benign), 3 (3% of patients) patients met the criteria for category 3 (atypia of uncertain significance), 6 (6% of patients) patients met the criteria for category 4 (atypia suspicious of malignancy), and 11 (11%) patients met the criteria for category 5 (atypical possibly malignant) (malignant). The degree of agreement between cytology and cystoscopy was quite low. **Conclusions:** Even though it has poor sensitivity, urine cytology is nevertheless a valuable test for the detection of bladder malignancies. Cytology is a useful adjunct to cystoscopy since the two procedures target distinct kinds of lesions when done effectively. In the event that urothelial neoplasia is suspected, both procedures need to be finished.

Keywords: Urothelial Neoplasia, Cystoscopy, Cytology

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INTRODUCTION

Urine cytology is a crucial diagnostic method for identifying urothelial neoplasia. It may be used in the examination of patients who are experiencing genitourinary symptoms, particularly hematuria, and it can also be used as a surveillance tool for patients who have had bladder cancer in the past. These are the two primary categories that it most often belongs to. Urinary bladder cancer, which ranks as the fourth most prevalent form of the disease in males and the ninth most common form in women, is responsible for a large amount of morbidity and mortality.¹ It has a high degree of specificity and very few instances of false-positive results. Patients who have been first diagnosed with bladder cancer are need to undergo ongoing monitoring due to the chronic nature of the disease.

It is very difficult to detect bladder cancer in its early stages since there is no obvious symptom linked with the disease.² In spite of the fact that hematuria is one of the most prevalent presenting symptoms, bladder cancer is not present in 90 percent of people who have the condition.³ Cystoscopy has been shown to be highly effective in the monitoring and follow-up of individuals who have been diagnosed with bladder cancer in the past. Urine cytopathology, when used in combination with cystoscopy, may assist in the identification of precancerous and cancerous cells found in the urine. Urinary cytology has a specificity that is rather good, particularly when it comes to the detection of carcinoma in situ as well as high-grade, flat lesions that might be difficult to identify with oncoscopy.^{4,5}

MATERIAL AND METHODS

Urology's department requested and received approval from the hospital's ethics council before beginning a research that was both prospective and analytical in nature. One hundred patients with hematuria from the urology outpatient department and the inpatient ward were recruited for the research. These patients might be of any age or gender. Individuals who had a history of prostatism, abdominal mass, urinary tract infection, anorexia, or weight loss, as well as proteinuria, were not allowed to participate in the trial.

METHODOLOGY

Voided urine cytology: The most common noninvasive approach for diagnosis in the process of identifying bladder cancer is cytology of the patient's voiding urine. The analysis of morphologic changes in intact cells is accomplished via the use of cytology. By the use of microscopy, exfoliated urothelial cells may be seen. Urine cytology typically requires a specimen that is at least 100 millilitres in volume and was recently voided. Since cells that have been resting in the urine overnight have a tendency to get

deformed and are difficult to evaluate, the first sample that was collected in the morning was discarded. It is possible that the number of cells in the urine is inadequate, which would need a higher amount of pee if the urine is highly dilute.

Due to the possibility that instrumentation may influence cellular results, specimens that were catheterized were labelled as such. Since urine often only includes a small number of cells, one of the procedures that is used in laboratories to prepare specimens is called cyto-centrifugation. In this procedure, aliquots of urine are centrifuged in order to concentrate the cells. A light microscope was used to view the stained slides after they had been prepared using the Papanicolaou procedure. When performed with this technique, the cytoplasm of transitional cells becomes a greenish-blue colour, while the nuclei take on a purple colour. The degree of cellular atypia and any other cytologic characteristics that were present were documented if malignancy was found. The cytology specimens were analysed independently of any clinical information that may have been available. Urine cytology Reports were scored as following

0	Inadequate or no specimen
1	Benign
2	Atypical probably benign
3	Atypia of uncertain significance
4	Atypia suspicious of malignancy
5	Malignant

By analysing voided specimens, we determined that the urothelial cells were unusual if they had a nuclear-to-cytoplasmic ratio (N/C) that was more than 50%. The atypical, reactive group was designated for the atypical instances, in which the cells were in cell clusters and had bubbly cytoplasm. Their nuclear membranes were intact and smooth, and they had a prominent nucleolus. On the other hand, the atypical, unclear category was used when the urothelial cells, even if they were single or few in number, appeared to be degenerated but displayed a high N/C ratio, intact and irregular nuclear membranes with clumpy chromatin, and/or a dark India ink chromatin pattern. This was the case even when the cells were single or few in number.

Cystoscopy: Cystoscopy is a minimally invasive office procedure that takes just a brief amount of time and is conducted with local urethral anaesthetic. Due to the relative absence of danger involved, cystoscopy is the method of choice for making a diagnosis of bladder cancer. The evaluation of the men was performed using a flexible cystoscope. Cystoscopy was conducted on female patients using either a flexible or a rigid cystoscope due to the relative straightness of the female urethra.

RESULTS

There were a total of 100 patients who presented with haematuria, and the results of the cystoscopy were accessible for all 100 instances. According to the findings of our research, patients in the age range of 50 to 60 years were the most likely to present with haematuria. (Table 1). Urine cytology results were scored, and cases were ranked from 0 to 5 on a scale from most severe to least severe. Throughout the course of our research, there were seven individuals who fell into category 0 (Inadequate or no specimen), since their smears had only a small number of degenerated cells and did not have a sufficient number of urothelial cells. Patients fell into group 1 in 73 (73%) of the cases (benign). No cases met the criteria for category 2 (atypical probably benign), 3 (3% of patients) patients met the criteria for category 3 (atypia of uncertain significance), 6 (6% of patients) patients met the criteria for category 4 (atypia suspicious of malignancy), and 11 (11%) patients met the criteria for category 5 (atypical possibly malignant) (malignant). (Table-2.) The degree of agreement between cytology and cystoscopy was quite low (Tables 3 & 4).

Table1: Gender and age distribution of patients with haematuria

Gender	Number	Percentage
Male	65	65
Female	35	35

Age		
Below 30	5	5
30-40	10	10
40-50	15	15
50-60	50	50
60-70	17	17
Above 60	3	3

Table 2: Urine cytology reports Scoring

Diagnostic Category	Number of cases	% of cases
0 = inadequate or no specimen	7	7
1 = benign	73	73
2 = atypical probably benign	0	0
3 = atypia of uncertain significance	3	3
4 = atypia suspicious of malignancy	6	6
5 = malignant	11	11

Table 3: Summary of Cystoscopy and cytology findings

	Abnormal cystoscopy	Normal cytology
Number of cases	50	50
	Normal cystoscopy	Normal cytology
Number of cases	20	20
	Abnormal cystoscopy	Abnormal cytology
Number of cases	27	27
	Normal cystoscopy	Abnormal cytology
Number of cases	3	3

Table 4: Agreement between Cystoscopy findings and urine cytology

		Cytology		Total
		Abnormal	Normal	
Cystoscopy	Abnormal	27	50	77
	Normal	3	20	23
Total		30	70	100

All of the patients that had abnormal cytology also had abnormal findings on the cystoscopy, with the exception of three instances in which the cystoscopy was normal but the urine cytology was described as category 4. If either cytology or cystoscopy or both showed positive results for the diagnosis of bladder recurrence, a cystoscopic biopsy was required to be performed. The combined use of cystoscopy and urine cytology had a specificity of 93% and a sensitivity of 100%. In our research, we found that cytology and cystoscopy had a low level of agreement; the proportion of agreement was just 40%. The kappa value is 0.11, which suggests that the cytology and cystoscopy results are not very consistent with one another.

DISCUSSION

Haematuria, either gross or microscopic, is found in the majority of individuals who have bladder cancer. The standard method for diagnosing bladder cancer is a procedure called a cystoscopy, which is supplemented by cytology. According to a study done by S. Pedomulluetal.⁶ Positive cytology was discovered in 87 out of 169 cases, which accounts for 51% of the total, while suspicious cytology was found

in 17 cases, which accounts for 10% of the total, and atypical cytology was found in 2 cases, which accounts for 1.1% of the total. Negative cytology was found in 57 out of 169 patients, which accounts for 34%. In our research, positive cytology was identified in 11 out of 100 instances, which is 11%, which is far lower than the percentage that they stated. This might be because to the presence of low-grade urothelial tumours, which cytology has a limited sensitivity to detect. Yet, we were only able to process and analyse a single urine sample despite the fact that three consecutive samples of void pee should have been processed. The screening study of urine cytology may be helpful in the therapy of urothelial cancer. A negative test does not, however, rule out the possibility of cancer. The sensitivity of this test is inadequate for detecting low-grade surface tumors.^{7,8} The vast majority of cases of transitional cell carcinoma may be attributed to this category of malignancies. According to the findings of our research, the age range of patients who presented with haematuria was most often between the ages of 50 and 60 years in men. The unusual group was found to account for 23.2% of the total number of urine cytologic cases, as stated by Brimo et al.⁹ Of those

instances, 59.3% (410/691) and 40.7% (281/691) fell to the categories of atypical, reactive and atypical, uncertain, respectively, and a malignant diagnosis was obtained in 5.5% of the cases. If either cytology or cystoscopy or both showed positive results for the diagnosis of bladder recurrence, a cystoscopic biopsy was required to be performed.¹⁰ The combined use of cystoscopy and urine cytology had a specificity of 93% and a sensitivity of 100%. In our research, we found that cytology and cystoscopy had a low level of agreement; the proportion of agreement was just 40%.

CONCLUSIONS

Even though it has poor sensitivity, urine cytology is nevertheless a valuable test for the detection of bladder malignancies. This research contributes to our comprehension of the diagnostic value of combining cystoscopy and cytology in the evaluation of patients suspected of having bladder cancer. Cytology is a useful adjunct to cystoscopy since the two procedures target distinct kinds of lesions when done effectively. In the event that urothelial neoplasia is suspected, both procedures need to be finished.

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