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A STUDY OF URINE CYTOLOGY WITH RESPECT TO THE PARIS SYSTEM IN A TERTIARY CARE CENTRE

Pathology

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ABSTRACT

Cytological examination of urine is of paramount importance in detecting urothelial neoplasms because it is a cost effective and non-invasive procedure. The main goal of urine cytology is the detection of urothelial carcinoma that is clinically significant, namely high-grade urothelial carcinoma (HGUC). This cross-sectional study was performed over a period of one and half years from November 2020 to April 2022. Preoprative, consecutive day1, day2 and day3 samples were collected and processed. A total of 251 urine samples received for cytopathological examination were analysed by MGG and PAP staining. In this study according to Paris System, 130 cases (51.8%), 55 cases (21.9%), 26 cases (10.4%), 36 cases (14.3%) and 04 cases (1.6%) were found to be negative for high-grade urothelial carcinoma (NHGUC), atypical urothelial cells (AUC), suspicious for high-grade urothelial carcinoma (SHGUC), high-grade urothelial carcinoma (HGUC) and insufficient respectively. The AUC, SHGUC and HGUC cases were correlated with USG guided biopsy. The sensitivity of urine cytology was calculated to be 82%. Cytology terminology reporting system is essential for good patient management, and good cytopreparatory techniques are essential to produce cells suitable for being described by standardized terminology reporting system.

KEYWORDS

Paris System, Urothelial Carcinoma

INTRODUCTION

The main goal of urinary cytology is the detection of urothelial carcinoma that is clinically significant, namely high-grade urothelial carcinoma (HGUC). Therefore, the understanding of this disease and particularly its pathogenesis is crucial in the process of creating The Paris System for Reporting Urinary Cytology.1,2 In the Paris system, the negative category includes reactive changes, infectious and non-neoplastic conditions as well as cases that may have some cytologic features of low-grade urothelial neoplasms, but are negative for HGUC. Therefore, the proposed diagnostic category is "Negative for High Grade Urothelial carcinoma (NHGUC). There are some cases where the definitive diagnosis can not be made, which are included in the categories of "Atypical Urothelial Cells" (AUC) and "Suspicious for High-Grade Urothelial Carcinoma" (SHGUC).3,4,6 Of importance is the understanding that the difference between AUC and SHGUC are quantitative since the diagnostic features for these two categories are based on similar morphologic findings.5 The Paris System stated the criteria of at least 20 well preserved and well visualized urothelial cells per 10 high power fields, in absence of obscuring lubricant, inflammatory cells or red blood cells, for stating the sample as adequate.7,8

MATERIALS & METHODS:

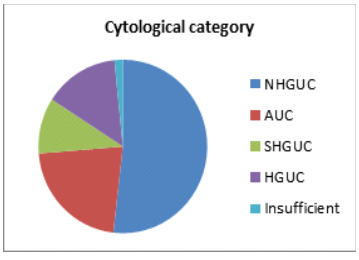
This study was carried out for a period of one and half years starting from November 2020 to April 2022. The study population included all patients attending the Department of Urology, Gauhati Medical College & Hospital, Guwahati with symptoms of haematuria or dysuria. A total of 251 preoperative cases were received for cytological evaluation in the Department of Pathology. For each case, urine samples were collected on day1, day2 and day3 consecutively. Following collections, urine samples were immediately centrifuged and smears were made from the sediment on clean grease free glass slides. The smeared slides were stained with Papanicolaou (PAP) stain and May Grunwald Giemsa (MGG) stain and then reported as per the Paris System. The study was designed to evaluate both the diagnostic precision as well as accuracy, thus follow up of the cases with biopsy or histopathological examination was done. For statistical analysis the correlation between cytology and histopathology was done considering the latter as the gold standard. Male : Female ratio was 3.18 : 1 and age group of all the cases were 30 – 90 year old.

RESULTS & OBSERVATIONS:

In this study, a total of 251 cases were reported as per Paris System and distribution of cases in each category was noted as depicted in Table1, the graphical representation of which is shown in a pie chart.

Table1: Cytological findings of all cases as per Paris System

Cytological category	No. of cases in Cytology (%)
NHGUC	130 (51.8)
AUC	55 (21.9)
SHGUC	26 (10.4)
HGUC	36 (14.3)
Insufficient	04 (1.6)



Out of total cases, 251 cases (51.8%), 55 cases (21.9%), 26 cases (10.4%), 36 cases (14.3%) and 04 cases (1.6%) were found to be negative for high grade urothelial carcinoma, Atypical urothelial cells, Suspicious for high grade urothelial carcinoma, high grade urothelial carcinoma and insufficient respectively. The AUC, SHGUC and HGUC cases were correlated with USG guided biopsy for final diagnosis as depicted in Table2.

Table2: Distribution of Cytological diagnosis with that of Histopathological diagnosis

Cytological category	No. of cases in Cytology	No. of cases in biopsy
NHGUC	130	130
AUC	55	11 (carcinoma)
SHGUC	26	19 (carcinoma)
HGUC	36	36
Insufficient	04	--

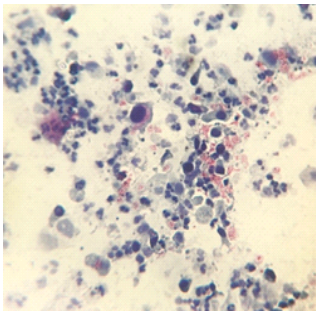


Fig1: Suspicious for high grade urothelial carcinoma (SHGUC)

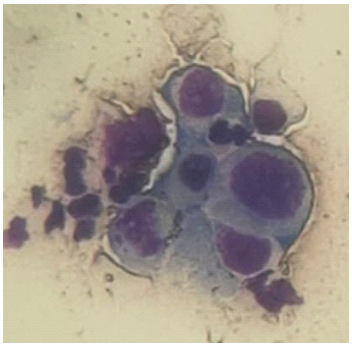


Fig2: Positive for high grade urothelial carcinoma (HGUC)

CONCLUSIONS:

Cytology terminology reporting system is essential to good patient management, and good cytopreparatory techniques are essential to produce cells suitable for being described by standardized terminology reporting system. The statistical correlations in Paris System have proved urine cytology as a highly useful test for diagnosing urothelial carcinomas.

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