Fuchs-Rosenthal Chamber For The Assessment of Microhematuria

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Summary

The Fuchs-Rosenthal Chamber was used for the examination of the urine of 120 unselected urological patients to record the exact number of RBC.

Sixty six (66) patients exhibited 10-100 erythrocytes/ml (n=30) and or more than 100 erythrocytes/ml (n=36) respectively; whereas in 54 patients less than 10 erythrocytes/ml were found.

Based on these findings asymptomatic nephrolithiasis and inflammatory diseases were the most common causes for microhematuria.

Introduction

The Fuchs-Rosenthal Counting Chamber is used for the evaluation of microhematuria. In the urine of healthy persons up to 5 red blood cells per ml is considered to be normal. The aim of this study is to present the data of urine analysis in an unselected group of patients (n=120) in regard to the exact amount of erythrocyte content.

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Material and Methods

The Fuchs-Rosenthal Chamber has a depth of 0.2 mm, a surface area of 16 mm and a volume of 3.2 ml. The results are expressed in number/ml.

As normal was considered up to 5 red blood cells/ml, 10-100 red blood cells/ml were charged as pathological erythroria (Grade I) and more than 100 erythrocytes/ml was regarded as true pathological (Grade II). This grading was used for differentiation of our material.

In 207 instances the Fuchs-Rosenthal Chamber was used to count the urinary leucocyte content. The urine of 120 patients was examined using the Fuchs-Rosenthal Chamber to record the exact number of red blood cells.

Results

In 120 unselected patients an exact counting of the urinary content of red blood cells was performed using the Fuchs-Rosenthal Chamber (Table-1). Sixty six (66/120) exhibited 10-100 erythrocytes/ml (n=30) and/or > 100 erythrocytes/ml (n=36) respectively, whereas in 54/120 patients less than 10 erythrocytes/ml were found. The highest percentage of erythroria was present in patients with asymptomatic nephrolithiasis and in cases with inflammatory diseases of the kidney, bladder and urethra; these patients had also a defined pyuria. Four (4) patients with a moderate trauma to the right or left flank had either a Grade I or Grade II erythroria. Two times a glomerulonephritis and a hydronephrosis and once a tuberculosis was detected, in 4 patients a BPH and in one a carcinoma of the prostate was discovered, one patient with condyloma also showed a Grade II microhematuria.

Discussion/Conclusion

Based on these findings asymptomatic nephrolithiasis and inflammatory diseases were the most common causes for microhematuria found by urine analysis with the Fuchs-Rosenthal Chamber. Our results correlate well with the studies of Hesse⁴, Koehler⁵, Laberke⁶ and Messing⁷. After traumatic lesions of the genitourinary tract with macrohematuria, this tech-
nique represents a practicable tool for further follow-up\textsuperscript{3,8}. A kidney or bladder tumor was not detected in this group of patients, a fact which was surprising as these tumors demonstrate in some extent a microhematuria as the only sign.

**TABLE-I**

**CAUSES OF MICROHEMATURIA**

<table>
<thead>
<tr>
<th>Causes of Microhematuria</th>
<th>10-100 Erythrocytes/ml</th>
<th>&gt; 100 Erythrocytes/ml</th>
</tr>
</thead>
<tbody>
<tr>
<td>Glomerulonephritis</td>
<td>-</td>
<td>02</td>
</tr>
<tr>
<td>Hydronephrosis</td>
<td>01</td>
<td>01</td>
</tr>
<tr>
<td>Inflammation (of kidney, bladder, urethra) with leucocyturia</td>
<td>12</td>
<td>08</td>
</tr>
<tr>
<td>Nephrolithiasis (only erythruria)</td>
<td>07</td>
<td>10</td>
</tr>
<tr>
<td>Nephrolithiasis (pyuria and erythruria)</td>
<td>-</td>
<td>03</td>
</tr>
<tr>
<td>Renal tuberculosis</td>
<td>01</td>
<td>-</td>
</tr>
<tr>
<td>Bladder neurogenic disease, interstitial cystitis, bladder neck polyposis and invasion from outside - without leucocyturia</td>
<td>05</td>
<td>06</td>
</tr>
<tr>
<td>Prostate (BPH, Ca)</td>
<td>04</td>
<td>01(Ca)</td>
</tr>
<tr>
<td>Traumatic lesion</td>
<td>03</td>
<td>01</td>
</tr>
<tr>
<td>Condylomata accuminata</td>
<td>-</td>
<td>01</td>
</tr>
<tr>
<td>No. of patients</td>
<td>30</td>
<td>36</td>
</tr>
</tbody>
</table>
References


