Microhaematuria in general practice: is urine microscopy misleading?

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SUMMARY. During a health centre screening programme for men aged 60 years and over, the urinary dipstick results of 58 patients found to have microscopic haematuria were compared with the results of immediate microscopy at the health centre and routine microscopy by a hospital laboratory. There was agreement between a positive dipstick test for haematuria and the presence of red cells at routine microscopy reported by the hospital laboratory in only 18 cases (31%). Routine urine microscopy results requested from general practice should not be taken as the criterion for deciding whether further investigation is needed in cases of microscopic haematuria.

Introduction
CURRENT clinical practice states that the finding of asymptomatic microscopic haematuria in men aged over 40 years should always be taken seriously and that urological investigation is mandatory in all cases.1 The rationale for this approach is that at least 20% of those investigated have an underlying urological abnormality and that in half of these cases the lesion is malignant.2

Urine dipstick tests offer a reliable and cost effective method of detecting blood in urine3 and are increasingly widely used in both hospital and community settings. Clinicians, however, tend to ignore a positive dipstick test unless urine microscopy has confirmed the presence of red cells.4 It is possible that this may influence the referral of patients for investigation and lead to serious underlying pathology being missed. This paper presents the findings from a pilot study for a bladder cancer screening programme, where the results of dipstick urinalysis for blood were compared with the results of urine microscopy.

Method
Men aged between 60 and 85 years who were registered with one health centre were invited to attend for a health check which included dipstick urinalysis.

Dipstick urinalysis was performed on freshly voided urine samples using Multistix SG testing strips (Ames). Two 10 ml aliquots of urine were collected in sterile containers and stored at room temperature. Urine microscopy was performed by the authors within two hours of collection. The urine was centrifuged at 2000 rpm for 10 minutes, the supernatant poured off, the sediment resuspended in the remaining urine and 10 fields examined under 400 times magnification. Microscopy findings were considered abnormal if two or more red cells were seen per high power field.4

The second sample was sent from the health centre in the routine manner for urine microscopy and culture at the local hospital laboratory. Hospital microscopy was performed using a sedimentation technique. Both immediate and hospital microscopy were performed without knowledge of the dipstick results.

The results of microscopy and the dipstick test were compared for the first 60 patients discovered to have dipstick haematuria as part of the validation process for a larger survey. Urological investigation including further light microscopy of urine at a hospital outpatient department was offered to these patients and the results of investigation are reported elsewhere.5

Results
Invitations were sent to 594 men of whom 398 attended, giving a response rate of 67%. The results of the urine dipstick tests for the attenders by age group are summarized in Table 1. The attendance rate was similar in all age groups. The prevalence of dipstick haematuria in this sample was 15%.

Table 1. Results of urine dipstick tests by age group of patients (n = 398).

<table>
<thead>
<tr>
<th>Age (years)</th>
<th>Negative</th>
<th>Trace positive</th>
<th>More than trace positive</th>
</tr>
</thead>
<tbody>
<tr>
<td>60–64</td>
<td>89</td>
<td>14</td>
<td></td>
</tr>
<tr>
<td>65–69</td>
<td>93</td>
<td>13</td>
<td>3</td>
</tr>
<tr>
<td>70–74</td>
<td>68</td>
<td>9</td>
<td>3</td>
</tr>
<tr>
<td>75–79</td>
<td>59</td>
<td>11</td>
<td>4</td>
</tr>
<tr>
<td>80–85</td>
<td>29</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>All</td>
<td>338</td>
<td>50</td>
<td>10</td>
</tr>
</tbody>
</table>

n = total number of patients

The results of the comparison of dipstick testing, immediate microscopy by the authors and routine microscopy by the hospital are summarized in Table 2. The microscopy results of two samples from the hospital were not available, providing a total of 38 comparable tests. Forty eight specimens showed a trace of blood (non-haemolysed or haemolysed) on dipstick testing and 10 specimens showed 'one plus' or higher level on the dipstick. The dipstick test gave 'false positive' results for 12 samples (21%) when compared with immediate microscopy but for 40 samples (69%) when compared with routine laboratory microscopy. In the 10 cases with one plus or more dipstick haematuria, there were no 'false positive' results when compared with early microscopy, but seven when compared with routine microscopy.

Discussion
Routine laboratory urine microscopy requested from general practice failed to confirm the presence of red cells in 69% of cases. Red blood cells occur in the urine of every normal individual6 but two or more red cells per high power field is generally regarded as abnormal and in need of further investigation. Such small numbers of red cells can be difficult to detect on light microscopy and this may account for some of the apparently false positive results.

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Table 2. Comparison of dipstick result with immediate and routine urine microscopy (n = 58).

<table>
<thead>
<tr>
<th>Microscopy result (no. of red blood cells per high power field)</th>
<th>Number of samples with dipstick result</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Non-lysed</td>
</tr>
<tr>
<td>Immediate</td>
<td>(n = 29)</td>
</tr>
<tr>
<td>&lt;2</td>
<td>9</td>
</tr>
<tr>
<td>2-5</td>
<td>15</td>
</tr>
<tr>
<td>6-10</td>
<td>3</td>
</tr>
<tr>
<td>11-20</td>
<td>2</td>
</tr>
<tr>
<td>Routine</td>
<td>0</td>
</tr>
<tr>
<td>1-5</td>
<td>6</td>
</tr>
<tr>
<td>6-10</td>
<td>1</td>
</tr>
<tr>
<td>11-20</td>
<td>-</td>
</tr>
</tbody>
</table>

n = total number of samples.

Even excluding the false positive cases identified by immediate microscopy, there is a considerable difference between haematuria detected by dipstick analysis and hospital laboratory microscopy. Samples are transported by van to the hospital laboratory in a sterile container containing boric acid to prevent bacterial overgrowth. The practice has one collection each day and the delay in reaching the laboratory after voiding is between two and six hours. This, together with unavoidable agitation of the specimens in transit, may result in considerable red cell lysis6 and false negative microscopy reports. The difference between the two methods of performing microscopy is also of possible importance.

The practical significance of microhaematuria detected by urine dipsticks is a subject of continuing discussion. Dipsticks in current use have a sensitivity of up to 99%, but with a false positive rate of 16%7 many clinicians have been concerned that they are oversensitive, particularly when the test has been only trace positive.8 Many general practitioners would not perform their own microscopy and thus laboratory microscopy is often regarded as a gold standard to confirm dipstick haematuria. Follow up of patients found to have dipstick haematuria at a private health screening clinic revealed that 39% of their general practitioners had not carried out any further investigations. In that study absence of red cells on urine microscopy was shown to be a factor in the decision of the doctor not to pursue investigations. Although some clinicians question the need to investigate all those with microscopical haematuria, the standard view remains that serious underlying pathology may be missed unless the cause of all bleeding, no matter how slight, is pursued.10 In this study if routine laboratory microscopy were the factor which determined further investigation, then up to 69% of cases of microhaematuria might forgo further testing.

References

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RCGP
Appointments

COLLEGE AUDIT ADVISER

Applications are invited for the post of Audit Adviser to the College.

The successful applicant will build on the College's long standing commitment to the incorporation of performance review and medical audit into everyday practice. The Adviser will have responsibility for developing further the educational applications of medical audit in general practice, and for encouraging the introduction and development of audit in as many practices as possible. The Audit Adviser will work closely with the faculties of the College in this and will have a major coordinating role in the collection, evaluation and dissemination of information about audit methods and their results.

The College is seeking to appoint a general practitioner who has considerable experience in the field of medical audit and performance review and who has skills in promoting at national and local levels the principles involved in this.

It is expected that the appointment will be for a three year period with three or four sessions per week. The remuneration will be pro-rata equivalent to the NHS Consultant scale.

Further details can be obtained from Dr Bill Styles, Chairman of the Education Division at 14 Princes Gate, London SW7 1PU (Tel: 01-581 3232, ext 210).