Evaluation of a screening test for detecting urinary tract infection in newborns and infants

B Lejeune, R Baron, B Guillois, D Mayeux

Abstract
The results of a study of a screening test for urinary tract infection (UTI) in infants under 18 months is reported. Two hundred and forty three urine specimens were tested in the laboratory using AMES Multistix 8SG reagent strips read by photometer. The strips included three potential markers for urinary tract infection: leucocyte esterase, nitrite, and protein. The predictive value of a positive result (PPV) was low. The predictive value of negative test (NPV) when combining the screen of leucocyte esterase, nitrite, and protein was 99.4% with no difference between boys and girls. The test for leucocyte esterase had a 97.6% negative predictive value. An examination of the results by age confirms the good NPV in all age groups.

Paediatricians should find Multistix 8SG strips a useful aid in the diagnosis of urinary tract infection in infants, and that costly culture of samples with negative strip tests can be avoided.

Boreland and colleagues reported the diagnostic value of a screening test for urinary tract infection in paediatric inpatients using three tests: nitrite, blood, and protein. We studied consecutive urine samples from 243 neonates and infants under 18 months: 85 were less than 28 days old; 81 aged between 21 and 182 days; and 77 were more than 182 days old. Our aim was to identify the dipstick test which gave the highest diagnostic accuracy in routine practice for this age group and to evaluate the leucocyte esterase test.

Method
Urine reagent strips for nitrite, leucocyte esterase, and protein were used (Multistick 8 SG AMES) and read by the Clinitek System photometer (AMES). All screening tests were performed by the same investigator in our laboratory. All samples were microscopically examined, cultured, and bacteria enumerated (DGU Institut Pasteur Production, France). The criteria for diagnosis of urinary tract infection were as follows: a combination of a white cell count of > 25 × 10⁹/l for boys or 50 × 10⁹/l for girls under 8 days of age; > 10 × 10⁹/l for those older than 8 days; and a bacterial count of > 10³ ml⁻¹ with a maximum of two bacterial species. Samples with 10⁹/ml⁻¹ or less, or those with more than two bacterial species were considered contaminated.

The statistical analysis of the screening tests results was based on Baye’s tests and compared with the criteria for diagnosis of urinary tract infection.

Results
Thirty seven (15.2%) specimens met the criteria for bacteriological infection, and 81 (33%) were regarded as contaminated. One hundred and forty six (60%) specimens were negative by the strip test and 97 were positive for one or more of leucocyte esterase, nitrate, or protein. The percentage of false negative results was 1.6% (four urine specimens) and was attributed to asymptomatic infection (> 10³/ml⁻¹) after review of the medical records.

The negative predictive value (NPV) obtained with the combination of leucocyte esterase and protein, and with the combination of leucocyte esterase, nitrate, and protein
Oncocytic metaplasia of the nasopharynx or extra-parotid Warthin’s tumour?

A P Griffiths, P Dekker

Abstract
A case of oncocytic metaplasia obstructing the Eustachian tube in an elderly patient is described. Histologically, it was similar to Warthin’s tumour of the parotid gland. The lymphocytes were predominantly T cell, unlike those of Warthin’s tumour which are predominantly B cell. It is proposed that oncocytic metaplasia represents an early stage in the evolution of Warthin’s tumour.

Warthin’s tumour, or adenolymphoma, occurs almost exclusively in the parotid gland where it accounts for 8% of tumours.

Discussion
The case described above and a similar recently reported case were both initially diagnosed as examples of extra-parotid Warthin’s tumour of the nasopharynx. Both were subsequently diagnosed as oncocytic metaplasia in view of the reported rarity of Warthin’s tumour in the nasopharynx. Indeed, the credibility of reports of Warthin’s tumour outside the parotid is questioned by some authors.

Oncocytic metaplasia, on the other hand, is a common occurrence in both major and minor salivary glands, its incidence increasing with age. When oncocytic metaplasia accompanied by dilatation of ducts occurs in close proximity to the ostium of an Eustachian tube it may cause obstruction, middle ear effusion, and

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**Efficacy (in per cent) of screening test in neonates and infants**

<table>
<thead>
<tr>
<th>Positive test area</th>
<th>Sensitivity</th>
<th>Specificity</th>
<th>Positive predictive value</th>
<th>Negative predictive value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Leucocyte esterase</td>
<td>89-2</td>
<td>78-2</td>
<td>42-3</td>
<td>97-6</td>
</tr>
<tr>
<td>Nitrite</td>
<td>16-2</td>
<td>97-6</td>
<td>54-5</td>
<td>86-6</td>
</tr>
<tr>
<td>Protein</td>
<td>8-1</td>
<td>95-1</td>
<td>23-1</td>
<td>85-2</td>
</tr>
<tr>
<td>Leucocyte esterase and nitrite</td>
<td>89-2</td>
<td>91-6</td>
<td>87-2</td>
<td>98-5</td>
</tr>
<tr>
<td>Leucocyte esterase and protein</td>
<td>89-2</td>
<td>95-1</td>
<td>76-7</td>
<td>98-0</td>
</tr>
</tbody>
</table>

was highest (table), but the NPV of leucocyte esterase alone did not differ significantly. The nitrite test alone showed a low sensitivity and the highest specificity. The result of this test when combined with leucocyte esterase and protein did not provide additional information in infants with urinary tract infection, contrary to the results obtained from adult patients.


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