SCREENING FOR BACTERIURIA IN MALAYSIAN SCHOOL CHILDREN

D Zainal, A Baba

ABSTRACT
Urinary tract infection is the most common of bacterial infections. Screening children for asymptomatic bacteriuria to prevent pyelonephritis and renal scarring is widely recommended.

INTRODUCTION
Urinary tract infections (UTI) are amongst the commonest bacterial infections in mankind. There is a high prevalence of UTI in apparently healthy populations all over the world and the morbidity and mortality of UTI have remained static even though there are many powerful and effective antimicrobial drugs.

If this is true then there would be ample scope for prevention by detection and treatment of asymptomatic infections, at the time when treatment of kidney failure by dialysis and transplantation are expensive realities.

The prevalence of asymptomatic bacteriuria in Malaysia is not known. We have taken this opportunity to explore this problem in our community by screening healthy school children. This will further enlighten us in the future management of bacteriuria.

MATERIALS AND METHODS
Urine specimens were obtained from 44,816 children (23,132 boys and 21,684 girls) for examination. They were in standard one to standard six, from 154 schools in three different districts in Kelantan, namely Tumpat, Bachok and Kota Bahru. Their ages ranged from 7-12 years.

Mid-stream urine collection was explained to the students and urine specimens were collected in sterile bottles. Urine collected were examined microscopically and sent for culture.

Two plates of cystine-lactose electrolyte deficient (CLED) agar were inoculated, one with 0.1 ml of undiluted urine and the other with 0.1 ml of 100-fold dilution. After overnight incubation, less than 100 colonies on the plate inoculated with neat urine indicate less than 10⁵ organisms/ml.

Children with positive cultures were studied further by plate culture method in the second screening test.

RESULTS
During the first screening tests, urine specimens were collected from 44,816 school children (23,132 boys and 21,684 girls). Positive cultures (significant bacteriuria) were detected in 240 (0.54%) school children; 82 (0.19%) of them were boys and 158 (0.35%) were girls.

Mixed growth were detected in 3,988 students (8.90%). While 1,099 (2.32%) students had bacteria in their urine which were less than 10⁵ colonies per ml. Both groups of students with mixed growth and colony count < 10⁵ per ml were considered as negative results.

Second screening tests were performed on students with positive cultures, mixed growth and culture with growth less than 10⁵ organisms per ml. Only 3,746 students turned up for the second screening of which 54 students (0.12% of those initially screened) were noted to have positive results. Of these, 16 were male (0.0357%) and 38 were female (0.0847%).

The organisms isolated in the first and second screenings were as tabulated in Tables I and II respectively.

DISCUSSION
From our study it was noted that the prevalence of significant bacteriuria among healthy school children was 0.12% after second screening. It is difficult to compare the results of others using different culture method but this figure seems to be

Table I - Organisms isolated at first screening (n = 240)

<table>
<thead>
<tr>
<th>Organism</th>
<th>no.</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Escherichia coli</td>
<td>69</td>
<td>28.75</td>
</tr>
<tr>
<td>2. Staph. sp.</td>
<td>61</td>
<td>25.42</td>
</tr>
<tr>
<td>3. Klebsiella</td>
<td>45</td>
<td>18.75</td>
</tr>
<tr>
<td>4. Streptococcus sp.</td>
<td>39</td>
<td>16.25</td>
</tr>
<tr>
<td>5. Proteus</td>
<td>15</td>
<td>6.25</td>
</tr>
<tr>
<td>6. Others</td>
<td>11</td>
<td>4.58</td>
</tr>
</tbody>
</table>

SINGAPORE MED J 1994; Vol 35: 374-375
lower than those of Kunin and Dodge in the United States who reported 1% to 1.5% as well as those from Itaka in the Japanese study who reported a prevalence of 0.28%.

Age factors were initially thought to be responsible for the difference in prevalence. However, the Japanese study noted that there was no difference in the prevalence of bacteriuria between primary and junior high school children. Hence, age factor could not be used to explain the difference in prevalence of bacteriuria between our study and the rest.

The prevalence of asymptomatic bacteriuria in school boys was 0.0357%. This was comparable to other reports as shown on Table III, while that of schoolgirls was 0.0847% which was the lowest reported (Table III).

The prevalence decreased markedly on second screening. This observation was also seen in other studies. This is perhaps due to the treatment taken for intercurrent illness in between periods of examination. The other possibility that needs to be proven later is whether this condition is intermittent or resolves spontaneously without treatment.

The organisms isolated were similar to other studies. Escherichia coli was the commonest organism isolated in both screenings. Klebsiella sp. and Staphylococcus sp. were among the other common organisms isolated.

At this point in time we are still unsure how to deal with those students with persistent bacteriuria. Some authors seriously question the advisability of treating all schoolgirls for asymptomatic bacteriuria and some state that treatment is not necessary.

We feel that there is a need to determine the natural history of the disease in our patients before we can establish whether treatment is necessary.

We would like to follow up our positive cases further to find out whether they are associated with renal tract anomalies.

CONCLUSION
This study has shown that the prevalence of bacteriuria amongst our school children is the lowest as compared to studies reported so far. The female to male ratio is 2.4:1. Escherichia coli is the commonest organism in the two screenings carried out.

ACKNOWLEDGEMENTS
We would like to thank the government of Malaysia for providing us the grant to carry out this study (grant no: 30706060302 University Science Malaysia. Kubang Kerian Kelantan).

REFERENCES