INTRODUCTION
Urinary tract infection (UTI) is a common bacterial illness among febrile young children, with a reported prevalence between 5.3% and 9.0% [1, 2, 3, 4, 5]. The clinical signs and symptoms of UTI are nonspecific and vague in the first 5 years of age. It may be present in febrile children with other illnesses, without any clinical evidence of UTI. Such infections if untreated can lead to subsequent renal scarring and are established risk factors of end stage renal disease. Thus, the high incidence of undiagnosed, improperly treated UTIs in young children is a cause of clinical and public concern.

The difficulty of correctly diagnosing UTIs in febrile children was evident in a study by Bauchner et al [6], in which all the episodes of febrile illnesses which were ultimately diagnosed as UTIs, had initially been assigned other diagnoses, including acute otitis media, gastroenteritis, upper respiratory tract infections and bronchiolitis. Various other studies from abroad have also shown that the routine urine culture in febrile children with a clinical evidence of other illnesses gave high positive yields [1, 2, 4, 6, 7, 8]. However, the precise data on the prevalence and the usefulness of the routine urine culture in febrile young children is not available from the developing countries. With a view on the above concerns, this study was under taken.

METHODS
Inclusion Criteria: Febrile children who were less than 5 years of age, who were admitted to the paediatric ward with an axillary temperature of ≥ 37.4°C within 24 hours of admission, were included in the study.

Exclusion Criteria: Those children who had received antibiotics or had undergone bladder catheterization within 48 hours prior to the admission were excluded.

A detailed history was taken and clinical examination was done in all the cases to find out the cause of the fever, with special emphasis being given to the symptoms of UTI. Necessary investigations were carried out to find the cause of the fever.

The perineum and the genitalia were washed with soap and water. A freshly voided, clean catch, mid stream urine sample was collected in sterile containers for urinalysis and culture. The urine was collected by catheterization in those children who could not void urine within 24 hours after admission, after taking aseptic...
precautions. Urinalysis was done within half an hour and the same specimen was immediately transported to the Department of Microbiology for urine culture.

The urine was cultured on CLED agar and Mac Conkey’s agar by using a 0.001ml calibrated wire loop and the plates were observed for 48 hours. Colony counts which were >50 x 10^3/ml and > 10^5/ml using a 0.001ml calibrated wire loop and the plates were observed respectively and have recommended routine urine culture as a part of the diagnostic evaluation. However, Bauchner et al [6] had reported a low prevalence of (1.75%) in 664 febrile children who were younger than 5 years. This low prevalence may be due to the

The analysis was done by using the SPSS version 17.0 statistical software.

RESULTS

Out of 334 febrile children, 27 cases were diagnosed to have UTI with an overall estimated prevalence of 8.08%. The results of this study were analysed as in [Table/Fig 1]

Statistical Analysis: Correlations between the variables were analysed by using the Chi-square test, the t’ test and the z’ test wherever necessary. P values < 0.05 were taken as statistically significant. The analysis was done by using the SPSS version 17.0 statistical software.

DISCUSSION

Over four decades ago, North [11] recognised that acute febrile illnesses in children might indicate hidden UTIs, but he dismissed this notion as he could find no growth in 26 consecutive samples. Larger and more recent studies which were carried by Roberts et al[12], Bonadio [13] and Hoberman et al [2] from abroad and by Dharnidharka et al [4, 7] from India have refuted this. Among 193 febrile children who were younger than 2 years, Roberts et al found that the rate of confirmed UTI was 4.1%. Similarly, Dharnidharka et al [4], Hoberman et al [2] and Bonadio [13], in their studies on febrile infants, reported a prevalence of 5.4%, 5.3% and 5.53% respectively and have recommended routine urine culture as part of the diagnostic evaluation. However, Bauchner et al [6] had reported a low prevalence of (1.75%) in 664 febrile children who were younger than 5 years. This low prevalence may be due to the

<table>
<thead>
<tr>
<th>Age (months)</th>
<th>Male</th>
<th>Female</th>
<th>Total no. of cases</th>
<th>Culture positive cases</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-12</td>
<td>69</td>
<td>44</td>
<td>113</td>
<td>5</td>
<td>4</td>
</tr>
<tr>
<td>13-60</td>
<td>122</td>
<td>99</td>
<td>221</td>
<td>8</td>
<td>10</td>
</tr>
<tr>
<td>Total</td>
<td>191</td>
<td>143</td>
<td>334</td>
<td>13</td>
<td>14</td>
</tr>
</tbody>
</table>

[Table/Fig-1]: Age and sex wise distribution of cases P > 0.05

<table>
<thead>
<tr>
<th>Temperature (°C)</th>
<th>Mean ± SD (°C)</th>
<th>Total no. of cases</th>
<th>Culture positive cases</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>37.4-38.3</td>
<td>37.8±0.39</td>
<td>132</td>
<td>6</td>
<td>4.54</td>
</tr>
<tr>
<td>38.4-39.3</td>
<td>38.8±0.28</td>
<td>144</td>
<td>12</td>
<td>8.33</td>
</tr>
<tr>
<td>&gt;39.3</td>
<td>40.0±0.50</td>
<td>58</td>
<td>9</td>
<td>15.51</td>
</tr>
</tbody>
</table>

[Table/Fig-2]: Temperature at the time of presentation P > 0.05

<table>
<thead>
<tr>
<th>Diagnosis</th>
<th>Male</th>
<th>Female</th>
<th>Total no. of cases</th>
<th>Culture positive cases</th>
<th>Percentage</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>ALRI*</td>
<td>45</td>
<td>30</td>
<td>75</td>
<td>1</td>
<td>0</td>
<td>1.33</td>
</tr>
<tr>
<td>AUR†</td>
<td>38</td>
<td>24</td>
<td>62</td>
<td>1</td>
<td>1</td>
<td>3.22</td>
</tr>
<tr>
<td>Acute gastroenteritis</td>
<td>35</td>
<td>17</td>
<td>52</td>
<td>1</td>
<td>4</td>
<td>9.61</td>
</tr>
<tr>
<td>Fever for evaluation</td>
<td>17</td>
<td>14</td>
<td>31</td>
<td>4</td>
<td>3</td>
<td>22.58</td>
</tr>
<tr>
<td>Neuroinfection</td>
<td>14</td>
<td>13</td>
<td>27</td>
<td>1</td>
<td>0</td>
<td>3.70</td>
</tr>
<tr>
<td>Enteric fever</td>
<td>12</td>
<td>14</td>
<td>26</td>
<td>1</td>
<td>0</td>
<td>3.84</td>
</tr>
<tr>
<td>Malaria</td>
<td>11</td>
<td>12</td>
<td>23</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>UTI</td>
<td>11</td>
<td>10</td>
<td>21</td>
<td>4</td>
<td>6</td>
<td>47.61</td>
</tr>
<tr>
<td>Viral hepatitis</td>
<td>8</td>
<td>9</td>
<td>17</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Total</td>
<td>191</td>
<td>143</td>
<td>334</td>
<td>13</td>
<td>14</td>
<td>27</td>
</tr>
</tbody>
</table>

[Table/Fig-3]: Causes of fever depending on provisional diagnosis
exclusion of those patients whose chief complaint was dysuria. In contrast to this, dysuria was the most common symptom (44%) in our study. In a study by Zorc et al [5], infants with a maximum recorded temperature of ≥39 °C had a higher rate of UTI (16.3%) than other infants (7.2%). We also found that 15.51% of the children with UTI had a temperature which was >39.3°C. However, there was no statistically significant difference among the three groups of temperatures.

In the present study, 17(62.96%) cases had a provisional diagnosis other than UTI, such as gastroenteritis, respiratory infection, etc. This suggests that 17 children with UTI would have been missed, if urine culture was not taken as a routine diagnostic method of evaluation. However, routine urine culture may not be beneficial in all the patients with fever.

Of the 137 patients with respiratory infections, only 3(2.18%) cases had UTI. This low yield is similar to the findings of the studies which were done by Bauchner et al [6] and Dharnidharka et al [4], who have shown a prevalence of 1.27% and 1.25% respectively. Routine urine cultures in such patients are not justified.

Of the 48 cases with gastroenteritis, 5(9.61%) patients had UTI. Female patients with gastroenteritis were particularly at an increased risk of getting UTIs (23.52%), which was statistically significant. This observation was in accordance with the findings of the studies which were done by Dharnidharka et al [4] and Srivaths et al [13], who reported a high prevalence of 25% and 40% respectively and recommended routine urine culture in such patients. Heavy periurethral colonization which is often associated with perineal contamination following gastroenteritis will explain the high degree of prevalence in these patients.

Out of 21 patients with a provisional diagnosis of UTI, 10 (47.61%) cases had culture proven UTI, which was similar to the findings of a study by John Matthai et al [14], who found it in 60% of patients with suspected UTI.

Seven (22.58%) cases who presented with fever with no apparent source, had UTI which represented a high yield. In a retrospective study on 508 children with fever of uncertain causes, Buys et al [15] reported significant bacteruria in 44(8.66%) children. Similarly, Roberts et al [12] and Shaw et al [16] had reported a high prevalence of UTI in children with no definite source of fever and recommended urine culture in such patients.

In the present study, one patient each with a provisional diagnosis of neuroinfection and enteric fever had UTI. Both Bauchner et al and Dharnidharka et al [4] had shown the absence of UTI in any of the patients with neuroinfection. In another study involving 28 children with enteric fever, Dharnidharka et al [7] had found 2 cases with positive urine cultures. In our study, no patients with malaria and viral hepatitis had UTI, which was similar to the observations made by Dharnidharka et al [7]. Hence, the routine urine culture in these patients is not useful.

CONCLUSION

Urinary tract infections should be considered as a potential cause of fever in children below 5 years of age. A high yield was obtained whenever UTI was suspected or in patients with fever with no apparent source and in female children with gastroenteritis.

REFERENCES

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DECLARATION ON COMPETING INTERESTS:
No competing Interests.

Date of Submission: Mar 25, 2011
Date of Peer Review: Mar 29, 2011
Date of Acceptance: Mar 31, 2011
Date of Publishing: June 13, 2011