Bacterial isolates from these home delivered neonates are shown in Table 1. Organisms isolated from blood/CSF in the neonates were Group B Streptococcus (4), Salmonella sp. Group B (2), Pseudomonas sp. (2), Haemophilus influenzae (1), Streptococcus pneumoniae (1) and coagulase negative Staphylococci (1). Eight babies yielded isolates from both blood and CSF and three only from the CSF. All the isolates were uniformly sensitive to cefotaxime and ampicillin. The Strep. pneumoniae isolate was penicillin resistant during treatment. One isolate of Salmonella was multi-drug resistant, susceptible only to ciprofloxacin. In the remaining six, the diagnosis was based on clinical features and CSF neutrophilic leucocytosis. All the 17 neonates were given intravenous cefotaxime and ampicillin. Antibiotics and supportive measures improved the outcome in nine neonates. The other eight died.

The CSF cell counts ranged from 60 to 1000 per mm$^3$ in our cases of neonatal meningitis. CSF cultures were sterile within 72 h of therapy, and the cell count, protein, and sugar levels in the CSF were normal at about day 7. Clinical recovery in survivors occurred from 3 to 28 days (mean 12). Of nine survivors of meningitis followed to their first birthday, three had obvious neurological sequelae, like ventriculo-peritoneal shunt, spastic cerebral palsy, and seizure disorder. There seemed to be no significant predisposing factors of sepsis in the mothers. Poor prognosis was indicated by prematurity and meningitis due to Strep. pneumoniae. H. influenzae, and Salmonella sp. Group B (three out of four with these infections).

In contrast to the Gram-negative bacterial isolates from neonates born in hospitals in India, the isolations from the homeborn neonates were predominantly, Gram-positive (Table 1). Wallace et al. have emphasized that non-typable H. influenzae are important pathogens in newborn, the isolation of this organism and Strep. pneumoniae which are not traditionally associated with neonatal meningitis is cause of concern in our region. In developing countries, populations with a high incidence of H. influenzae infection have a younger distribution.

There is little data from developing countries on CSF isolation of bacteria from children with bacterial meningitis and our study points to H. influenzae infection as a potential problem amongst neonates.

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References

Sir,

Gestational Age Assessment in Preterm Neonates
Weighing Less than 2500 Grams

Postnatal assessment of gestational age (GA) in preterm neonates is traditionally performed using the methods of Dubowitz and Ballard. Dubowitz et al. in 1970, Ballard et al. in 1977, and in 1991 Tunçer et al. in 1982 introduced a scoring system for GA determination in an attempt to improve the accuracy of assessment. Our study has been designed to determine the accuracy of Dubowitz, Ballard, and Tunçer methods in a sample of low birth weight preterm neonates.

Neonates included in this study are 91 preterm singletons with GA ranging from 28 to 38 weeks delivered during a 2-year period. All neonates met the following criteria: (1) birth weights less than 2500 g; (2) reliable GA by last menstrual period (LMP); and (3) complete Dubowitz, Ballard, and Tunçer neonatal examination performed. All Dubowitz, Ballard, and Tunçer examinations were done in the first 30–42 h of life by one of three pediatricians, masked to the presumed GA.

Data obtained from Dubowitz, Ballard, and Tunçer examinations were compared with GA assessments from LMP using Pearson correlation coefficient and by calculating percentages of agreement. Pearson correlation coefficients ($r$) were used to indicate the strength of the linear relationship between GA calculated using LMP, and those derived from the Dubowitz, Ballard, and Tunçer assessments. Mean differences between GA assessment by LMP and Dubowitz, Ballard, and Tunçer were calculated as follows: (GA by LMP) – (GA by Dubowitz, Ballard, and Tunçer respectively). Infants were classified as small for gestational age (SGA) if birth weight fell below the 10th percentile for dates GA using Lubchenco et al. percentile. Preterm infants were defined as having GA less than 38 weeks.

The mean birth weight was 1729 ± 427 g (SD), 32 per cent were less than 1500 g, 68 per cent were between 1500 and 2500 g. The mean of the distribution was 34.2 ± 2.3 weeks for Tuncer.

Table 1 indicates the mean differences between the four measures and their percentages of agreement. A slight difference (0.8) was observed between the means of the LMP and Tunçer measures. Although exact agreement in these two measures was found in 13.2 per cent of the cases, nearly 94 per cent of the cases had LMP
Table 1

Differences in distribution means and percentage agreement among gestational age determination measures*

<table>
<thead>
<tr>
<th>Measures</th>
<th>Mean difference (weeks)</th>
<th>% Exact agreement</th>
<th>% Agree ±1 week</th>
<th>% Agree ±2 weeks</th>
</tr>
</thead>
<tbody>
<tr>
<td>LMP-Dubowitz</td>
<td>-0.3</td>
<td>20.9</td>
<td>60.4</td>
<td>98.9</td>
</tr>
<tr>
<td>LMP-Ballard</td>
<td>-0.1</td>
<td>20.9</td>
<td>59.3</td>
<td>98.9</td>
</tr>
<tr>
<td>LMP-Tunçer</td>
<td>-0.8</td>
<td>13.2</td>
<td>57.1</td>
<td>93.4</td>
</tr>
<tr>
<td>Dubowitz-Ballard</td>
<td>0.2</td>
<td>49.5</td>
<td>98.9</td>
<td>98.9</td>
</tr>
<tr>
<td>Dubowitz-Tunçer</td>
<td>-0.5</td>
<td>23.1</td>
<td>80.2</td>
<td>96.7</td>
</tr>
<tr>
<td>Ballard-Tunçer</td>
<td>-0.7</td>
<td>16.5</td>
<td>75.8</td>
<td>95.6</td>
</tr>
</tbody>
</table>

* Abbreviations: LMP, last menstrual period.

and Tunçer values within ±2 weeks of each other. Even higher agreement was found between LMP and Dubowitz/Ballard and between Dubowitz and Ballard. In 99 per cent of the cases the agreement was within ±2 weeks. Our data indicate that Dubowitz, Ballard, and Tunçer examinations systematically over-estimate GA as judged from LMP. However, the over-estimation was more significant for Tunçer examination than the Dubowitz/Ballard examinations. However, more than 90 per cent of Tunçer examination agreed with the LMP/Dubowitz/Ballard GA within 2 weeks. In our study, mean GA differences between LMP and Dubowitz/Ballard/Tunçer was less than 1 week. The mean of the estimated GA of 91 newborns did not differ significantly between the Tunçer and the Dubowitz/Ballard methods.

Compared with the Dubowitz measures, Pearson correlation coefficients of Ballard (r = 0.85) and Tunçer (r = 0.88) was similar to that of LMP (r = 0.85). The highest correlation coefficient was between Dubowitz and Ballard (r = 0.97).

In previous studies in Turkey, fetal malnutrition was found in 8.9 per cent and 15 per cent of singletons. In our study, mean fetal malnutrition ratio was 21 per cent in preterm group. SGA rate of our study group was rather high. Because of our high SGA rate we can speculate, that infants born prematurely at this GA, may have had intrauterine stress that accelerates fetal maturation, resulting in higher maturational scores.

The results of our study show that the value of the Tunçer method is that it can be executed rapidly and easily and can be used instead of the Dubowitz/Ballard methods for GA 29–37 weeks.

References