MECONIUM STAINING OF AMNIOTIC FLUID AND ITS ASSOCIATION WITH FETAL DISTRESS AND GESTATIONAL AGE


Abstract

Analysis of 1,359 liveborn babies was done in respect of gestational age, meconium staining of amniotic fluid and presence of fetal distress. The incidence of meconium-stained amniotic fluid and fetal distress were found to be 7.9 and 13.1 per cent respectively. Only 3.7 per cent of the babies less than 34 weeks' gestation passed meconium in utero, and in half of them it was a sign of fetal anoxia. Neonatal listeriosis was proved in four term babies. The relationship of meconium staining of amniotic fluid and gestational maturity is discussed.

Meconium staining of amniotic fluid either at amniocentesis or at labour in a non-breech presentation is usually taken as a sign of fetal hypoxia. It has been suggested that the passage of meconium in utero is related to fetal maturity and is very rare in prematures even inspite of intrauterine anoxia, except in neonatal listeriosis. The aim of the present study was to find out the incidence of meconium staining of the amniotic fluid in relation to gestational age and fetal distress; and to determine whether fetal listeriosis is associated with in utero passage of meconium in the absence of fetal distress and/or prematurity.

Material and Methods

All babies born during January through November 1979 were investigated. Evidence of fetal distress (based on clinical examination and fetal heart rate monitoring) and meconium staining of amniotic fluid were recorded. Babies with breech presentation were excluded. Meconium-stained babies were screened for listeriosis by one of the authors (ST) as part of an ongoing I.C.M.R. project.

The gestational age was assessed from the mothers' menstrual history and by using the gestational score method of Singh based on physical and neurological criteria.

Results

Total babies born during this period were 1,359. Fetal distress was recorded in 179 cases (13.1 per cent of all the deliveries). Amniotic fluid was meconium stained in 108 (7.95 per cent of all babies). Fetal distress and meconium passage were present together in 70 cases...
(39.1 per cent of all babies with fetal distress).

Neonatal listeriosis was proved in four cases, all of whom were term babies.

The relation of meconium staining, gestational age and fetal distress is shown in Table 1.

Table 1. Meconium Staining, Gestational Age and Fetal Distress

<table>
<thead>
<tr>
<th>Gestational age (wk)</th>
<th>No of babies (n=1359)</th>
<th>No. with meconium in A.F. (n=108)</th>
<th>No. with meconium in A.F. &amp; F. distress (n=70)</th>
<th>% of meconium-stained babies who had distress</th>
</tr>
</thead>
<tbody>
<tr>
<td>37 and above</td>
<td>1204</td>
<td>97</td>
<td>64</td>
<td>66.0</td>
</tr>
<tr>
<td></td>
<td>(88.6)*</td>
<td>(89.8)</td>
<td>(91.4)</td>
<td></td>
</tr>
<tr>
<td>34 to 37</td>
<td>111</td>
<td>7</td>
<td>4</td>
<td>57.1</td>
</tr>
<tr>
<td></td>
<td>(8.2)</td>
<td>(6.5)</td>
<td>(5.8)</td>
<td></td>
</tr>
<tr>
<td>&lt;34</td>
<td>44</td>
<td>4</td>
<td>2</td>
<td>50.0</td>
</tr>
<tr>
<td></td>
<td>(3.2)</td>
<td>(3.7)</td>
<td>(2.9)</td>
<td></td>
</tr>
</tbody>
</table>

* Figures in parentheses indicate % of all babies in that group (vertical columns).

F. distress = fetal distress; A.F. = amniotic fluid

Discussion

Meconium starts appearing in the gut of the fetus as early as 16 weeks’ of gestation. Passage of meconium in utero is the response of the fetal gastrointestinal tract to hypoxia, which induces hyperperistalsis as well as relaxation of anal sphincter. It could also be a manifestation of normal intrauterine defecation.

Meconium staining of amniotic fluid occurs in 10 to 20 per cent of all deliveries. In the present study meconium staining was observed in 8.0 per cent of deliveries but breech deliveries were excluded.

Of babies who passed meconium, 89.8 per cent were more than 37 weeks’ gestation. A similar observation has been made by Mathews and Warshaw. In their study there was not a single case of meconium staining before 34 weeks’ gestation, but in the present study there were 6.48 and 3.70 per cent of cases with meconium staining between 34-37 and less than 34 weeks’ gestation respectively.

Similar incidence has also been reported by Meis et al.

Stress-related in utero passage of meconium is supposed to be rare in pre-term infants, due to poorly developed adaptive mechanism of preferential vasoconstriction. On the other hand meconium staining of amniotic fluid during midtrimester amniocentesis, done for various hypoxic stressful situations has been recorded.

We have observed a diminishing trend in the incidence of meconium staining of amniotic fluid associated with fetal distress in early gestations. The exact incidence is difficult to determine due to the small sample size at these early gestations in the present study.