EPITHELIAL SQUAMES IN FETAL LUNGS AS AN INDEX OF RESPIRATORY INSUFFICIENCY*

M. Madhavan, Prema Sivasankaran, C. Ratanakar and K. Chandra
Pondicherry

It has been contended by many workers that the presence of epithelial squames or fat positive fragments of vernix caseosa or lanugo hairs in the alveoli of fetal lungs indicates aspiration of amniotic fluid by the sucking movements of the fetus (Farber and Sweet 1931). It is disputed, however, whether this provides the basic lesions in the pathogenesis of pulmonary hyaline membrane syndrome (Lauffe and Stevenson 1956) and plays a role in the mortality of the neonates especially the premature babies. With the emergence of clinical criteria of the respiratory distress syndrome (Gomez et al. 1969, Downes et al. 1970), assessment of the importance of the presence of amniotic fluid contents in the fetal alveoli becomes very critical. We wish to analyse our experience of 260 perinatal autopsies with a view to correlate the presence of epithelial squames, which is the most reliable component of amniotic fluid debris, with clinical evidence of respiratory insufficiency.

Material and Methods

A total of 260 perinatal autopsies were studied and one section of each lung was studied as a routine where no specific lesion was grossly discernible and, more sections when a specific pathology was suspected. The slides were reviewed without the clinical data and the presence of the epithelial squames in the pulmonary alveoli was noted. A correlation was then made with maternal age, parity, maternal diseases like pre-eclampsia or eclamptic toxaemia, diabetes mellitus or hypertension. Lastly an analysis of fetal respiratory insufficiency was made based on clinical impressions and the presence of epithelial squames in these infants was compared with those who died of other causes.

Observations

Figs. 1 and 2 show the correlation between maternal age and parity, and the presence of alveolar squames. Table 1 shows the relationship between conditions predisposing to fetal asphyxia, stillbirth, twinning, prematurity and clinically diagnosed respiratory distress with the presence of alveolar squames. Our observations show that maternal age does not act as a contributory factor to fetal aspiration of amniotic fluid. The numeral status of the fetus appears to play some role, as 30% of the babies
with pulmonary alveolar squames were first born. A review of the cases in relation to fetal and maternal contributory factors for intrauterine asphyxia did not yield any rewarding results. 6 out of 10 cases diagnosed as respiratory distress showed alveolar squames but a more accurate clinical grading was thought to be necessary before attaching any significance to this finding.

Discussion

As early as the 16th century, Vesalius noticed that disturbed placental circulation in an animal fetus brought about definite respiratory movements of the jaw and thorax with sucking in of amniotic fluid. This was confirmed in human fetuses by Davis and Potter (1946) but with a proviso that amniotic fluid is normally aspirated into the lungs as part of the normal intrauterine respiratory activity of the human fetus. Studies undertaken by instilling amniotic fluid into neonatal guinea pigs (Avery 1963), and in neonatal lambs (Johnson and Faridy 1965), however, showed laboured respiration with a high incidence of spontaneous deaths. This indicated that the presence of fluid in the neonatal

Table 1. *Correlation between presence of alveolar squames and other data related to perinatal deaths.*

<table>
<thead>
<tr>
<th>Fetal lungs</th>
<th>Dead born</th>
<th>Prematurity</th>
<th>Live born full term</th>
<th>Maternal disease</th>
<th>Twins</th>
<th>Respiratory distress</th>
</tr>
</thead>
<tbody>
<tr>
<td>With squames</td>
<td>50</td>
<td>16</td>
<td>27</td>
<td>5</td>
<td>4</td>
<td>6</td>
</tr>
<tr>
<td>Without squames</td>
<td>50</td>
<td>26</td>
<td>69</td>
<td>9</td>
<td>6</td>
<td>4</td>
</tr>
<tr>
<td>Total No.</td>
<td>100</td>
<td>42</td>
<td>96</td>
<td>14</td>
<td>10</td>
<td>10</td>
</tr>
</tbody>
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