Original Research Article

Outcome of neonates born through Meconium stained amniotic fluid in tertiary health care centre

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Received: 29 December 2017
Accepted: 27 January 2018

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ABSTRACT

Background: Meconium Aspiraion Syndrome (MAS) is an important cause of morbidity and mortality among newborns in the developing world. Meconium stained amniotic fluid (MSAF) occurs in approximately 13% of all live births.

Methods: This was a prospective observational study to assess the risk factors related with MSAF deliveries and MAS. All the details regarding mode of delivery, APGAR score (AS), birth weight, fetal distress, maternal age, any maternal illness, gestational age, clinical course, outcome was recorded and evaluated.

Results: In the present study total of 100 babies born through MSAF were included of which the incidence of respiratory distress was noted in 62% (62 babies).

Conclusions: Appropriate monitoring of respiratory distress at birth and assessing the high-risk cases will surely help in reducing the morbidity and mortality in vigorous babies born through MSAF.

Keywords: Clinical course, MAS, MSAF, Outcome

INTRODUCTION

Meconium Aspiraion Syndrome (MAS) is an important cause of morbidity and mortality among new-borns in the developing world. Meconium stained amniotic fluid (MSAF) occurs in approximately 13% of all live births.1 Presence of meconium is a sign of fetal distress warranting immediate evaluation and action. MAS is defined as respiratory distress in an infant born through MSAF whose symptoms otherwise cannot be explained.2 It leads to poor lung compliance, hypoxemia leading to respiratory distress with complications like respiratory failure, pulmonary air leaks and persistent pulmonary hypertension of newborn.

One third of infants require intubation and mechanical ventilation and newer neonatal therapies like high frequency ventilation, inhaled nitric Oxide and surfactant administration.3,4 Meconium staining of the amniotic fluid (MSAF) occurs in around 4% of deliveries before 37 weeks, 10-20% of term deliveries, and up to 30-40% of post-term deliveries. The meconium aspiration syndrome (MAS) develops in 2.0% to 9% of infants born through MSAF. Meconium aspiration syndrome is a disease of the term and near-term infant.

Mild MAS requires less than 40% oxygen for less than 48 hours. Moderate MAS requires more than 40% of oxygen for more than 48 hours with no air leak. Severe MAS requires assisted ventilation for more than 48 hours and is often associated with PPHN.7 Several factors, e.g. abnormal fetal heart rate, caesarean delivery, thick MSAF, low Apgar scores have been associated with an increased risk of developing MAS.8 The disease is associated with high morbidity and the reported mortality rate is 4 to 5%.9 Though the risk of developing
respiratory distress is less among vigorous than non-vigorous, they are more likely to get missed or detected late when not monitored postnatally.\textsuperscript{10} Aim of the study was to find out the clinical course and outcome of vigorous neonates born through meconium stained amniotic fluid which may or may not be present at birth.

**METHODS**

All live babies born though MSAF over duration of 1 year from June 2016 to May 2017 were enrolled. This was a Prospective observational study to assess the risk factors related with MSAF deliveries and MAS all the details regarding mode of delivery, APGAR score (AS), birth weight, fetal distress, maternal age, any maternal illness, gestational age, clinical course, outcome was recorded and evaluated.

**Inclusion criteria**

Term neonates of gestational age more than 37 weeks with birth weight >2.5 kg, born through Meconium stained amniotic fluid, vigorous at birth.

**Exclusion criteria**

Neonates <37 weeks of gestational age, non-vigorous babies born through meconium stained amniotic fluid, neonates with congenital anomaly or respiratory distress due to other cause eg.surgical cause or suspected heart disease.

Sepsis screen was done for those babies developing respiratory distress. Data regarding maternal risk factors and neonatal parameters were collected.

**RESULTS**

One hundred vigorous babies born through meconium stained amniotic fluid were analysed of which 62% (62 out of 100 babies) developed respiratory distress (Table 1).

**Table 1: Incidence of respiratory distress.**

<table>
<thead>
<tr>
<th>Respiratory distress</th>
<th>Frequency (percent)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Present</td>
<td>62 (62%)</td>
</tr>
<tr>
<td>Absent</td>
<td>38 (38%)</td>
</tr>
</tbody>
</table>

**Table 2: Comparison with mode of delivery.**

<table>
<thead>
<tr>
<th>Mode of delivery</th>
<th>Respiratory distress</th>
<th>No respiratory distress</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal vaginal delivery</td>
<td>9 (14%)</td>
<td>5 (13%)</td>
</tr>
<tr>
<td>Caesarean section</td>
<td>53 (86%)</td>
<td>33 (87%)</td>
</tr>
</tbody>
</table>

The Present study showed 14% (9 babies) delivered vaginally had Respiratory distress and 86% (53 babies) delivered through caesarean section developed respiratory distress (Table 2).

In the present Study among the babies who developed respiratory distress 80% (49 babies) had a positive CRP value and 20% (13 babies) had a negative CRP value.

**Table 3: Septic screening.**

<table>
<thead>
<tr>
<th>CRP</th>
<th>Frequency (percent)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Positive</td>
<td>49 (80%)</td>
</tr>
<tr>
<td>Negative</td>
<td>13 (20%)</td>
</tr>
</tbody>
</table>

**Table 4: Treatment modalities.**

<table>
<thead>
<tr>
<th>Treatment modality</th>
<th>Frequency (percent)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1\textsuperscript{st} line antibiotics</td>
<td>38 (62%)</td>
</tr>
<tr>
<td>2\textsuperscript{nd} line antibiotics</td>
<td>8 (12%)</td>
</tr>
<tr>
<td>3\textsuperscript{rd} line antibiotics</td>
<td>6 (10%)</td>
</tr>
<tr>
<td>Nasal CPAP</td>
<td>10 (16%)</td>
</tr>
</tbody>
</table>

Among the babies who required treatment 62% of babies required only HOOD O2 and 1\textsuperscript{st} line antibiotics based on routine protocol followed in our NICU setup. 12% of babies required 2\textsuperscript{nd} line antibiotics, 10% of babies required 3\textsuperscript{rd} line antibiotics. 16% of the babies required Nasal CPAP support. All the babies improved eventually, and feeds were started gradually and discharged home.

**DISCUSSION**

Meconium aspiration syndrome is one of the most common cause of neonatal morbidity which leads to various sequelae and therefore it is essential to identify the risk factors in order to prevent poor outcome. In the present study total of 100 babies were included of which the incidence of respiratory distress was noted in 62% (62 babies) (Table 1).

In the present study we noted that 14% (9 babies) delivered vaginally had respiratory distress and 86% (53 babies) delivered through caesarean section developed respiratory distress (Table 2). In the present study among the babies who developed respiratory distress 80% (49 babies) had a positive CRP value and 20% (13 babies) had a negative CRP value.

In a study by Singh SN et al, in which 77.27% (17 of 22 neonates) with non-MAS respiratory distress, the cause could represent transient tachyypnea of newborn without classical radiological findings, or culture negative sepsis.\textsuperscript{10} This observation correlates with that found in our studies. The relationship of MAS in the presence of abnormal heart rate of the fetus, APGAR score of <6 and also the presence of thick meconium has been reported in literature.\textsuperscript{11} Present study revealed that of the 62 infants who developed respiratory distress 66% (41 babies) (Table 5) had risk factors like PIH, anemia, PROM, prolonged labour, fetal distress, breech presentation,
delivery by caesarean section, presence of thick meconium, staining of cord/skin/nail, post-dated delivery with a significant $p$ value of less than 0.05.

Respiratory distress at birth or within 12 hours of life was seen in all 62 infants, which emphasizes the need of initial 24 hours as the crucial period for monitoring. Among the babies who required treatment 62% of babies required only HOOD O2 and 1st line antibiotics based on routine protocol followed in our NICU setup. 12% of babies required 2nd line antibiotics, 10% of babies required 3rd line antibiotics. 16% of the babies required Nasal CPAP support. In another study by Goldsmith JP et al 30 % to 50% cases of MAS may require mechanical ventilation or continuous positive airway pressure.12

<table>
<thead>
<tr>
<th>Maternal risk factors</th>
<th>Respiratory distress</th>
<th>No respiratory distress</th>
</tr>
</thead>
<tbody>
<tr>
<td>Present</td>
<td>41 (66%)</td>
<td>4 (10%)</td>
</tr>
<tr>
<td>Absent</td>
<td>21 (34%)</td>
<td>34 (90%)</td>
</tr>
</tbody>
</table>

In this study parameters such as gravida, PIH, anemia, PROM, prolonged labour, fetal distress, breech presentation, delivery by caesarean section, presence of thick meconium, staining of cord/skin/nail, postdated delivery, were taken as risk factors to predict the development of respiratory distress (Table 5). Present study revealed that of the 62 infants who developed respiratory distress 66% (41 babies) (Table 5) had risk factors like PIH, anemia, PROM, prolonged labour, fetal distress, breech presentation, delivery by caesarean section, presence of thick meconium, staining of cord/skin/nail, postdated delivery with a significant $p$ value of less than 0.05.

Respiratory distress at birth or within 12 hours of life was seen in all 62 infants, which emphasizes the need of initial 24 hours as the crucial period for monitoring. Among the babies who required treatment 62% of babies required only HOOD O2 and 1st line antibiotics based on routine protocol followed in our NICU setup. 12% of babies required 2nd line antibiotics, 10% of babies required 3rd line antibiotics. 16% of the babies required Nasal CPAP support.

Limitation of the present study is being a tertiary hospital where many obstetric cases were referred cases incidence of babies developing respiratory distress and requiring some intervention was reported to be high.

CONCLUSION

Finally, appropriate monitoring of respiratory distress at birth and assessing the high-risk cases will surely help in reducing the morbidity and mortality in vigorous babies born through MSAF.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: The study was approved by the Institutional Ethics Committee

REFERENCES
