

### **Meconium Aspiration Syndrome: Recent Concepts**

We wish to offer the following comments about the editorial on Meconium Aspiration Syndrome(1).

Meconium aspiration syndrome (MAS) is defined not by 'the presence of meconium below the vocal cords'(1) but by the occurrence of respiratory distress soon after birth in the presence of meconium staining of the liquor or staining of nails or umbilical cord or skin with radiological evidence of aspiration pneumonitis (atelectasis or hyperinflation(2). The proposal that 'Meconium aspiration' should replace the term MAS still needs to be validated(3).

The pathophysiologic concepts of MAS have not undergone such a drastic change as the authors suggest. MAS is currently thought to result from a combination of acute airway obstruction, chemical pneumonitis, alveolar edema, increased pulmonary vascular and airway resistance, changes in compliance and Functional Residual Capacity and ventilation-perfusion abnormalities(4).

The role of pulmonary vasoconstriction in *in-utero* muscularisation of intra-acinar arteries has been emphasized in cases of MAS who have Persistent Pulmonary Hypertension of the Newborn (PPIIN),

especially in fatal cases(5). It is not known what proportion of cases of MAS have these mechanisms operative. Most infants with MAS have chest hyperinflation and do not manifest signs of PPIIN. This suggests that mechanisms other than pulmonary vasoconstriction are dominant. Certainly, to implicate 'pulmonary vaso-hyper-reactivity' as the primary aberration would be inaccurate.

There is no convincing evidence in the literature to support the statement that 'inhaled meconium may produce a mild disease in an unasphyxiated infant and a severe disease in an 'injured and severely asphyxiated lung'. On the contrary, 56% of the babies who developed MAS in Wiswell's series(6) had no asphyxia. Also, out of 12 non-intubated non-suctioned neonates with MAS, 4 died or required extracorporeal membrane oxygenation. So infants without asphyxia can develop severe MAS.

The paper of Gregory *et al.*(7) is wrongly quoted as showing no correlation between X-ray findings and clinical disease and no significant difference in incidence of MAS in suctioned and non suctioned neonates using the combined approach. Most people will recall Gregory's paper as the landmark article which described the decreased mortality of MAS following endotracheal intubation when compared with historical controls. These authors did not compare suctioned and non-suctioned infants nor did they use the combined approach of Carson *et al.* (8). They also showed that of the neonates with meconium in the trachea, only those with an abnormal chest radiograph developed MAS.

Is meconium aspiration an *in utero* event or does it occur with the first few postnatal breaths? Both mechanisms are possible(3) but their relative importance is yet to be determined. There are no satisfactory randomized controlled trials to provide answers to the multiple controversies regarding MSL and MAS. Based on the available literature we reiterate that intrapartum aspiration of meconium is important in the causation of MAS, though an unknown proportion of cases have *in utero* aspiration.

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#### Reply

"Meconium Aspiration" and not "Meconium Aspiration Syndrome (MAS)" is defined as the presence of meconium below vocal cords. This error which escaped our attention during correction is regretted. We entirely agree with Drs. Gautham and Narang that MAS is defined as the occurrence of respiratory distress soon after birth in the presence of meconium staining of liquor or staining of nails, umbilical cord or

skin, along with radiological evidence of atelectasis or hyperinflation. It is specially relevant to clearly define these terms as only a small proportion of babies born through meconium stained liquor have evidence of meconium aspiration and only a small fraction of the latter develop respiratory distress along with radiological changes characteristic of MAS.

Regarding the pathophysiologic concepts of MAS, it has been correctly pointed out by Drs. Gautham and Narang that MAS is thought to result from a