THE EFFICACY OF SURFACTANT THERAPY FOR MECONIUM ASPIRATION SYNDROME (MAS)

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MAS

- Meconium in tracheobronchial tree
  - Airway obstruction
    - Air block
  - Inflammation (chemical/infectious)
    - Atelectasis
      - Ventilation/perfusion mismatch
        - Hypoxemia/acidosis
          - Pulmonary hypertension
What is the role of surfactant in the treatment of MECONIUM ASPIRATION SYNDROME?
3 META- ANALYSIS
META-ANALYSIS 1

TI Surfactant for meconium aspiration syndrome in full term/near term infants.
AU El Shahed Al, Dargaville P, Ohlsson A, Soll RF
SO Cochrane Database Syst Rev. 2007;

OBJECTIVES: To evaluate the effect of surfactant administration in the treatment of term/near-term infants with MAS.
META-ANALYSIS 1

4 RCTs, 326 infants

- 4 trials: no difference of mortality

- 2 trials (n = 208): The risk of requiring ECMO was significantly reduced; (RR: 0.64, 95% CI 0.46, 0.91); NNT 6 (95% CI 3, 25).

- 1 trial (n = 40): a statistically significant reduction in the length of hospital stay [mean difference - 8 days (95% CI -14, -3 days)].

- No statistically significant reductions in any other outcomes studied
Conclusion:

- Reduce the severity of respiratory illness, and the number of infants requiring support with ECMO

- The efficacy of surfactant therapy compared to, or in conjunction with, other treatment: iNO, surfactant lavage and HFV remains to be tested
META-ANALYSIS 2


[Efficacy of pulmonary surfactant therapy in neonates with meconium aspiration syndrome: a meta-analysis].

[Article in Chinese]
Luo FF, Yang DY, Chen P, Hua ZY.

Department of Neonatology, Children’s Hospital, Chongqing Medical University, Chongqing 400014, China.

OBJECTIVE: The efficacy of pulmonary surfactant (PS) replacement therapy for meconium aspiration syndrome (MAS) remains controversial. This study aimed to evaluate the efficacy of PS therapy in neonates with MAS by a meta-analysis.
META-ANALYSIS 2

8 RCTs, 512 MAS neonates (257 cases PS/255 cases in the control group).

- Reduced OI (P=0.003)
- Shortened hospitalization days (P=0.0001)
- Decreased mortality rate (OR=0.47; 95%CI: 0.24, 0.93; P=0.03) significantly
- Increased arterial oxygen/alveolar oxygen ratio (P<0.00001)
- No statistical differences in the durations of mechanical ventilation, oxygen therapy, the incidences of air leak, pulmonary hemorrhage and ICH
META-ANALYSIS 2

Conclusion:

- Currently published evidence from RCTs suggests that PS replacement therapy is effective for MAS
- Further evidence from RCTs is needed to prove the efficacy
META-ANALYSIS 3


Lung lavage for meconium aspiration syndrome in newborn infants.
Hahn S, Choi HJ, Soll R, Dargaville PA.
Department of Medicine, Seoul National University College of Medicine, Seoul, Korea, South. hahns@snu.ac.kr.

OBJECTIVES: To evaluate the effects of lung lavage on morbidity and mortality in newborn infants with MAS.
META-ANALYSIS 3

4 RCTs

- No difference of mortality by lung lavage
- No significant improvements in mortality, pneumothorax, duration of mechanical ventilation or duration of hospitalization
UP TO DATE

- Do not routinely administer surfactant to all patients with MAS
- Administer surfactant to patients with severe disease
  - Mechanically ventilated and
  - FiO$_2$ (>0.5) and
  - High mean airway pressure (>10 to 12 cmH$_2$O)
UP TO DATE
The management of MAS is supportive. The following approach is suggested (Grade 2C):

• Maintenance of adequate oxygenation and ventilation
• Mild or moderate disease: Supplemental oxygen therapy is usually adequate
• Severe disease: mechanical ventilation, surfactant therapy, and/or iNO
• Have failed to response to other interventions, ECMO may be a life-saving intervention
CONCLUSION

- Surfactant therapy is efficacious for severe MAS
  - Decrease mortality rate
  - Shorten hospitalization days
  - Reduce the severity of respiratory illness
- Further evidence from RCTs is needed to prove the efficacy
THANKS FOR YOUR ATTENTION