Volume 04, Issue 05 (September-October 2021), PP 35-37 **www.ijmsdr.org**
ISSN: 2581-902X

International Journal of Medical Science and Dental Research

Less Invasive Surfactant Administration (LISA) in a Term Newborn with Moderate Meconium Aspiration Syndrome – A case report

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Abstract : *One of the indications for surfactant replacement therapy has been moderate to severe meconium aspiration syndrome. In neonates who require high ventilator settings, it is usually administered via endotracheal tube. Less invasive methods of surfactant administration have not been studied in neonates with MAS. We present a case of meconium aspiration syndrome in which surfactant was administered via transtracheal catheter, a less invasive method. The neonate showed rapid clinical and radiological improvement, resulting in a short hospital stay.*

Keywords – *LISA, MAS, meconium, neonate, respiratory distress, surfactant*

I. INTRODUCTION

Meconium aspiration syndrome (MAS) has been one of the most devastating diseases in developing-country NICUs, with postmature infants being the most vulnerable. Surfactant may reduce the severity of respiratory outcomes [1]. Less invasive surfactant administration (LISA) has been shown to improve short term outcomes in preterm RDS [2]. There is no literature of role LISA in meconium aspiration syndrome. We describe a case of MAS wherein surfactant administered through a thin catheter resulted in rapid pulmonary improvement.

II. CASE

A male baby was referred after being born at term via emergency caesarean section through meconium-stained amniotic fluid. The newborn was vigorous at birth and required delivery room CPAP. On admission the neonate was vigorous with a respiratory rate of 90/min, heart rate 160/min, and Downe's score of 5/10, requiring continuous positive airway pressure (CPAP) of 8 cmH2O with FiO2 60%. Arterial blood gas at 2 hours of postnatal age showed metabolic acidosis with high lactates (A-a gradient 346.3). Chest X ray was suggested of meconium aspiration syndrome (Fig. 1a), functional echocardiography revealed moderate pulmonary hypertension. With clinically worsening respiratory distress and a need for FiO2 >0.5 to maintain target saturations with underlying parenchymal involvement, one dose of beractant (6ml/kg) through a thin catheter (surfcath) was administered on postnatal 4th hour. Improvement in the need for respiratory support, blood gas parameters (A-a gradient 19.6) and CXR (Fig. 1b) was observed within 6 hours of surfactant administration. CPAP was gradually weaned and stopped over 48 hours. Both his blood counts and C-reactive protein levels were normal. The neonate required respiratory support for a total of three days before being discharged from the NICU on the fourth day with no pulmonary complications.

In this case surfactant was delivered by a less invasive method using surfcath. It was used as a rescue modality to avoid invasive ventilation. The neonate showed improvement in clinical, radiological as well as blood gas parameters. Among other mechanisms, the maintenance of spontaneous breathing with beneficial effects on progressive lung recruitment and aeration, as well as the resolution of the pendelluft phenomenon, may have contributed to this rapid improvement [1,3]. Surfactant reflux (~3ml) was the only side effect observed. Surfactant reflux may have occurred because of the high dose.

III. CONCLUSION

To the best of authors' knowledge, the index patient is the first reported case with meconium aspiration syndrome, treated with surfactant by LISA method. LISA appears to be promising in improving short term pulmonary outcomes. More controlled trials on patient selection, dose and timing of surfactant administration, and short- and long-term outcomes are needed.

Acknowledgements

We thank Dr Arti Rajhans and Dr Rajan Joshi for their valuable inputs.

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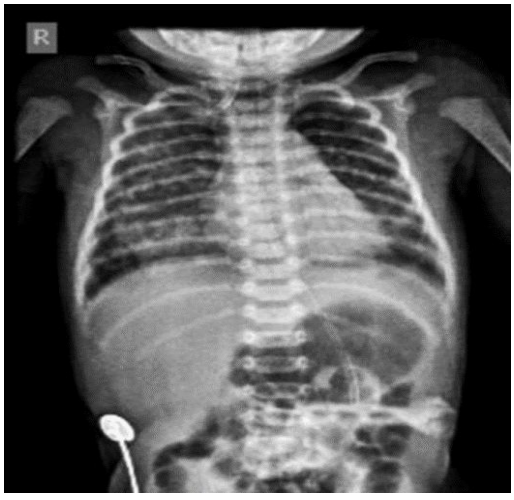

Fig. 1. Pre surfactant CXR suggestive of MAS


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