

New approach for surfactant administration, brief report

D. Surkov

NICU, Regional Children's Hospital, Dnepropetrovsk, Ukraine

Corresponding author: D. Surkov, NICU, Regional Children's Hospital, Kosmitcheskaya St. 13, 49100 Dnipropetrovsk, Ukraine. Email: densurkov@hotmail.com

Key points

Interrupting of ventilatory support during endotracheal surfactant administration in newborns with respiratory distress syndrome often causes some degree of instability during the procedure. A new approach for surfactant administration using closed neonatal suction systems may avoid these complications.

Abstract

Objective

To improve efficacy and safety of endotracheal surfactant administration in newborns with severe respiratory insufficiency

Methods

Neonatal closed suction system was used in respiratory unstable neonates for surfactant administration without ventilator interruption.

Results

Surfactant administration was done with significant efficacy. Neither adverse events nor respiratory deterioration during and after procedure were obtained.

Conclusions

The use of closed suction system is a cheap, effective and safe method for endotracheal surfactant administration in newborns.

Keywords: respiratory distress syndrome, surfactant, neonates

Introduction

Respiratory failure secondary to surfactant deficiency is a major cause of morbidity and mortality in preterm infants. Surfactant therapy substantially reduces mortality and respiratory morbidity for this population. Secondary surfactant deficiency also contributes to acute respiratory morbidity in late-preterm and term

neonates with meconium aspiration syndrome, pneumonia/sepsis, and perhaps pulmonary hemorrhage; surfactant replacement may be beneficial for these infants. Surfactant has traditionally been administered through an endotracheal tube either as bolus, in small aliquots, or by infusion through an adaptor port on the proximal end of endotracheal tube [4]. Usually it accompanies by interrupting ventilatory support, which often causes some degree of instability during the procedure.

From another hand recently attention has been given to closed suction systems which partially are replacing open suction systems performing endotracheal toilet in mechanically ventilated newborns [1, 2, 3, 5]

Methods

Using of DARTM Neonatal Closed Suction System (Covidien, USA) routinely used for suction in all intubated babies in NICU of Dnepropetrovsk Regional Children's Hospital (Ukraine) was suggested for endotracheal surfactant administration without ventilator interruption in extremely respiratory unstable neonates with severe respiratory distress syndrome and signs of persistent pulmonary hypertension. Technique of procedure has been shown on Figure 1 and movies been attached. Picture shows special circle-shaped switch to toggle from suction to fluid administration and

back. Some our movies (open access, voice in Russian) may be visualized through the following links:

New approach for surfactant administration. Part

1. <http://youtu.be/A8Y37uJIP5c>

New approach for surfactant administration. Part

2. <http://youtu.be/BhSVIJWoXAE>

New approach for surfactant administration. Part

3. <http://youtu.be/4J4yBVWEAfQ>

Results and discussion

Surfactant administration was done with significant efficacy. Neither adverse events nor respiratory deterioration during and after procedure were obtained. DAR™ Neonatal Closed Suction System (Covidien, USA) doesn't require any additional equipment or removing after surfactant administration. Doctor can administer surfactant as fast (or as slow) as it has been indicated without any disconnection or ventilatory interrupting. System requires turning of circle-shaped switch to one side and pushing the syringe with surfactant, or use of syringe pump for continuous infusion. Then turn switch back - and system can be used for routine sucking up to 72 hours.

Figure 1. Technique of endotracheal surfactant administration through DAR™ Neonatal Closed Suction System (Covidien, USA).



Conclusions

The use of closed suction system is a cheap, effective and safe method for endotracheal surfactant administration in respiratory unstable newborns without ventilatory interrupting.

References

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