New approach for surfactant administration, brief report

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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 a 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 DAR™ 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

Surkov et al. Ibuprofen and PDA closure
Some our movies (open access, voice in Russian) may be visualized through the following links:

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 been used for routine sucking up to 72 hours.

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