

The effect of continuous PEEP administration during surfactant instillation on cerebral hemodynamics in intubated preterm infants: a NIRS study

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April 16, 2024

Abstract

Objective: There is an ongoing debate about the best and comfortable way to administer surfactant. We hypothesized that uninterrupted respiratory support and continuous PEEP implementation while instilling surfactant via endotracheal tube (ETT) with side port will result in higher regional cerebral tissue oxygenation (rcSO₂) and the alterations in cerebral hemodynamics will be minimal. **Methods:** Preterm infants who required intubation in the delivery room and/or in the first 24 hours of life with gestational age <32 were enrolled. Patients were intubated either via conventional ETT or ETT with side port (Vygon®) with appropriate sizes. Following NICU admission a NIRS probe placed on the forehead and each infant were monitored with NIRS. In conventional ETT group, patients separated from the ventilator while surfactant was instilled. In ETT with side port group respiratory support was not interrupted during instillation. Heart rate, oxygen saturations, rcSO₂, cerebral fractional tissue oxygen extraction (cFTOE) and blood pressures were recorded. **Results:** A total of 46 infants analyzed. Surfactant was instilled with conventional ETT in 23 and ETT with side port in 23 infants. Birthweights (1037±238 vs 1152±277g) and gestational ages (28±2.3 vs 29±1.6weeks) did not differ between groups. During instillation of surfactant, rcSO₂ levels [61.5 (49-90) vs 70 (48-85)] and cFTOE levels 0.28 (0.10-0.44) vs 0.23 (0.03-0.44) were similar (p=0.58 and 0.82 respectively). **Conclusion:** Interruption of respiratory support during surfactant instillation did not significantly alter the cerebral tissue oxygenation. These results did not support our hypothesis possibly due to small sample size and should be confirmed with further studies.

Title page

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Running title: Surfactant treatment on cerebral hemodynamics in intubated preterm infants

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Funding source: This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

Declaration of competing interest: The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Authors' Contributions

NO had primary responsibility for protocol development and analytic framework of the study, outcome assessment, and manuscript preparation. HB and GKK participated in the development of the protocol and analytic framework of the study, had primary responsibility for review of the files, patient screening, enrollment, and data entry, and prepared the manuscript with NO. MB,FEC,GKS and SSO contributed to preparation and revision of the manuscript.

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Keywords: cerebral oxygenation, premature, noninterrupted surfactant instillation, NIRS

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