

DIFFERENT CEREBRAL HEMODYNAMIC PATTERNS OF AEROSOLIZED AND INSTILLED SURFACTANT IN PRETERM LAMBS WITH RESPIRATORY DISTRESS SYNDROME

X. Murgia¹, E. Gastiasoro-Cuesta¹, A. Valls-i-Soler¹, V.E. Mielgo¹, E. Ruiz del Yierro¹, L. Andrés-Alvarez², H. Lafuente¹, F.J. Alvarez-Díaz¹, S. Gomez-Urquijo³, C. Rey-Santano¹

¹Neonatal Research Unit, ²Department of Pathology, Hospital de Cruces, Barakaldo, ³Department of Neuroscience, University of the Basque Country, Leioa, Spain

Background: Surfactant instillation into the lungs of preterm babies has been associated with adverse peridosing episodes, including cerebral blood flow fluctuations. Aerosolized surfactant might prevent the rapid hemodynamic changes observed after surfactant instillation.

Methods: 21 preterm lambs (80-90%GE) delivered by cesarean section were randomly assigned to receive instilled surfactant (SFinst, 200mg/kg, n=7), aerosolized surfactant (SFAero, 200mg/kg, n=7) or no treatment (control, n=7). PaO₂/FiO₂, PaCO₂ and pH were determined by arterial blood gas analysis immediately before the treatment (baseline) and 5, 15, 30 and 60 minutes after the start of the therapy. Carotid blood flow (Q'car), HR and MABP were also measured at baseline and every minute during the first 10 minutes after the start of the therapies, and 15, 20, 30 and 60 minutes thereafter.

Results: At the end of the follow up period, the gas exchange was markedly improved in the SFinst and SFAero groups. For instance, oxygenation was significantly ($p < 0.05$) improved by SFinst ($237.88 \pm 168.45 \text{ mmHg}$) and SFAero ($233.84 \pm 67.59 \text{ mmHg}$) groups with respect to the control group ($33.37 \pm 17.08 \text{ mmHg}$). Regarding Q'car, there were no significant differences between groups at baseline. However, 5 min after the start of the therapy Q'car increased in the SFinst group ($263.14 \pm 77.77 \text{ mL/min}$) whereas it gradually decreased in the SFAero group ($176.00 \pm 50.47 \text{ mL/min}$; $P < 0.05$). This trend in Q'car between SFinst and SFAero groups was observed until the end of the follow up period ($P < 0.05$, MANOVA). There were no remarkable differences in HR and MABP.

Conclusion: Aerosolized surfactant improves gas exchange and avoids Q'car fluctuations in preterm lambs.