

NEWBORN RESUSCITATION - LONGER PERIODS OF INITIAL VENTILATION AND THE IMPACT ON MARKERS OF BRAIN INFLAMMATION IN NEWBORN PIGS

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Background: We wanted to explore if longer initial ventilation intervals than 30 s prior to initiation of cardiac compressions during resuscitation of newborn pigs would modulate levels of inflammatory markers in the newborn pig brain.

Material and methods: Newborn pigs were anaesthetized and mechanically ventilated. Progressive asphyxia was induced until asystole occurred. Animals received ventilation for 30 s, 60 s or 90 s before onset of chest compressions. After return of spontaneous circulation, the pigs were observed for 4 hours before cerebrospinal fluid (CSF) and samples from the brain were collected.

Results: CSF: IL-6 (pg/ml) and TNF α (pg/ml) were significantly lower in the 60 s group (30.2 ± 25.6 and 34.6 ± 27.2) compared to the 30s group (154 ± 168.3 and 86.2 ± 50.7), $p=0.02$ and $p=0.01$, respectively. There were significantly lower levels of S100 in the 30 s group ($19.1 \text{ ug/L} \pm 20.3$) compared to the 90 s group ($42.1 \text{ ug/L} \pm 30.7$), $p=0.01$.

Frontal cortex: We found no significant differences in inflammatory markers between the groups in the frontal cortex.

Hippocampus: Gene expression of MMP-2 was significantly lower in the group ventilated for 60 s compared to the 30 s group, $p=0.02$.

Conclusion: We found a higher inflammatory response in pigs resuscitated from cardiac arrest to ROSC when providing ventilation for 30 s and 90 s compared to 60 s of initial ventilation, indicating that a slightly longer ventilation period than the recommended guidelines of 30 s might be beneficial.