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Resuscitation Science Symposium

Session Title: Session VIII: Best Original
Resuscitation Science

Abstract 162: Noninvasive Measurement of Cerebral Blood Flow in Piglets During Resuscitation Induced Physiologic Challenges

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Introduction: Monitoring brain blood flow and oxygenation is essential during treatment of patients in which brain perfusion may be compromised, and may serve as a future goal to direct therapy. However, there are currently no noninvasive devices that measure cerebral blood flow (CBF) and oxygenation continuously. The Cerox monitor (Ornim Medical, Lod, Israel) is a novel device, based on Near Infra Red Spectroscopy, that enables rapid, noninvasive measurement of these parameters. The aim of this study is to examine the ability of the Cerox to monitor CBF during different resuscitative maneuvers.

Methods: Four piglets were anesthetized and ventilated. CBF was manipulated by iv Norepinephrine (2.5µg/Kg), Hypercapnea ($\text{FiCO}_2=7\%$), Hyperventilation ($\text{ETCO}_2=25\text{mmHg}$) and iv Acetazolamide (12.5mg/Kg). CBF was monitored using the Cerox (CBFcer) and a Laser Doppler Electrode (Moore

Instruments, UK) (CBFId). *Results are reported as percent±SE.*

Results: *Epinehrine injection:* Average heart rate was $200\pm 44\%$ CBFcer was $350\pm 125\%$, and CBFId was $175\pm 28\%$. Cerox detected 7/8 cases of CBF rise. *Hypercapnea:* Average $ETCO_2$ was 65 ± 3 mmHg, CBFcer was $172\pm 23\%$, and CBFId was $163\pm 18\%$. Cerox detected 8/8 cases of CBF rise. *Hyperventilation:* Average $ETCO_2$ was 26 ± 0.7 mmHg, CBFcer was $74\pm 5.5\%$, and CBFId was $74\pm 7.5\%$. Cerox detected 4/5 cases of CBF decrease. *Acetazolamide:* Average $ETCO_2$ was 23 ± 2.7 mmHg, CBFcer was $80\pm 2.1\%$, and CBFId was $78\pm 6.2\%$. Cerox detected 4/4 cases of CBF decrease. Total agreement between CBFcer and CBFId was 23/25 cases (92%), with a Kappa=0.828.

Conclusions: In clinical scenarios such as resuscitation, where cerebral perfusion may be compromised, continuous noninvasive monitoring of CBF is feasible during treatment, may provide crucial information to caregivers, alter treatment and change neurological outcome.

Author Disclosures: **A. Nini:** [Employment](#); Significant; Employed as Medical Director of Ornim Medical until March 2010. **N. Racheli:** Scientist. **H. Grinberg-Rashi:** Director Clinical Affairs. **I. Breskin:** Chief Scientist, Ornim Medical. **M. Kamar:** VP Clinical Affairs.

Key Words: Brain • Blood flow • Monitoring, physiologic

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