A71 - Real time monitoring of cerebral oxygenation, cerebral tissue P02 and cerebral blood flow during rapid ventricular pacing in neurovascular surgery.

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Introduction:
Rapid Ventricular Pacing (RVP) is an effective method for inducing a low cardiac output status in a controlled and directly reversible manner during neurovascular surgery according to surgical needs. RVP facilitates the exploration and clipping of the aneurysm by reducing the pressure in the aneurysm and reduces the risk of intraoperative rupture. Repetitive or prolonged periods of extreme cerebral hypo-perfusion may lead to intraoperative cerebral ischemia. The aim of the study was to investigate the sensitivity of brain tissue oxygen pressure (PtiO2) and CBF measurements to changes in mean arterial pressure, FiO2 and end-tidal (ET) PCO2 during RVP.

Methods:
After Institutional Ethics Committee approval and written informed consent, five patients undergoing craniotomy for neurovascular surgery were enrolled in the study. After induction and maintenance of anesthesia with remifentanil, propofol TCI and rocuronium, a bipolar pacing electrode was introduced into the right ventricle. Patients were normoventilated using O2/air (FiO2 0.3). A Foresight NIRS sensor was placed on the forehead contralateral to the side of craniotomy. A PtiO2 microcatheter and cerebral blood flow catheter was placed in the white matter of a non-eloquent area within the surgical exposure. The effects of RVP (180/'), hyperventilation and hyperoxygenation on cerebral oxygenation, CBF and PbtO2 were measured.

Results:
Drop in MAP, induced by RVP, reduced immediately CBF (-57.19%) and O2 delivery (-62.09%). As soon as sinus rhythm and MAP were restored, an overshoot of CBF (135.02%) and O2 delivery (121.60%) could be observed. Raising FiO2 from 0.3 to 1.00 significantly enhanced cerebral tissue oxygenation (226.78%).

CBF was highly susceptible towards changes in ET PCO2 (3-5%/mmHg)

Conclusion:
PbtO2 and CBF allowed real-time monitoring of cerebral oxygenation and perfusion during surgical treatment of a cerebral aneurysm.