CEREBRAL OXYGENATION MONITORING DURING OPEN HEART SURGERY

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Imbalance between cerebral oxygen supply and demand is thought to play an important role in the development of cerebral injury during cardiac surgery [1]. Therefore, monitoring cerebral oxygenation invasively by jugular bulb oximetry and non invasively by near infrared spectroscopy (NIRS) can help in identifying patients’ at risk for such injuries and may help in formulating therapeutic strategies [2].

Near infrared spectroscopy (NIRS) is a method for non-invasive monitoring of cerebral oxygenation and haemodynamics. Different devices provide information on changes of oxygenated (HbO₂) and deoxygenated haemoglobin (HHb), oxidized cytochrome aa3 (CytOx) or regional oxygen saturation (rSO₂). NIRS has been used during adult and pediatric cardiac surgery. It appears that despite the advances in NIRS technology and approval for some devices it is still has several limitations and still a research tool.

Jugular bulb oxygen desaturation (SjO₂ < 50%) has been detected in 17-84% of patients during rewarming from cold CPB). SjO₂ desaturation has been recorded in 31-55% of patients in the first 40 min during warm CPB (37 °C). These periods of decreasing SjO₂ (down to ≤ 50 %) during rewarming were associated with postoperative neuropsychological dysfunction [1,2]. Therefore better rewarming strategies that can prevent impairment in cerebral oxygenation should be used.

References: