Abstract 1886:

Near-Infrared Spectroscopy Is Not Useful To Detect Impairment Of Oxygenation During Thoracic Surgery With One-Lung Ventilation

Torsten Loop, Jakob Fehlings, Department of Anesthesiology and Critical Care, University Hospital Freiburg, Germany

Background and Goal of Study:

The near-infrared spectroscopy is a method to measure cerebral tissue oxygen saturation ($SctO_2$) continuously. During thoracic surgery with one-lung ventilation (OLV) various studies found a significant decrease in $SctO_2$.^{1,2} This study tested the hypothesis that thoracic surgery with OLV and normoxia is not accompanied with a significant decrease in regional $SctO_2$.

Materials and Methods:

After informed consent, $SctO_2$, oxygenation and invasive hemodynamic blood pressure (MAP) were measured in adult patients undergoing thoracic surgery at opened pleura and OLV. Tracheae were intubated with DLTs of the Robertshaw type with the bronchial branch placed contralateral to the side of surgery. During pressure controlled OLV values of $SctO_2$, paO_2/FiO_2 and MAP were recorded at baseline, lateral position, 15 min after initiation of OLV and pre-extubation.

Results and Discussion:

38 patients were included in this study (mean age 63 (21 – 83); ASA II/III/IV 17/17/4). Since MAP was comparable at all time points (Fig.1A), paO_2/FiO_2 ratio dropped during OLV (Fig.1B; $p<0.0001$). $SctO_2$ levels did not show any significant difference at any time point (Fig. 2A). Only six patients showed critical $SctO_2$ levels below 60% (Fig. 2B).

Table 1: Patient Demographics

Number of Patients	38
Age in years (Min – Max)	63 (21 – 83)
Sex (male/female)	25/13
Weight in kg (Min – Max)	77 (48 – 118)
Height in cm (Min – Max)	173 (158 – 196)
ASA-Classification (II/III/IV)	17/17/4
Comorbidity:	
Arterial Hypertension	19
Coronary Heart Disease	5
COPD	7
Renal Insufficiency	2
Diabetes mellitus	9
Intraoperative Vasopressor:	
Noradrenalin (yes/no)	30/8
Mechanical Ventilation:	
FiO_2 (Min – Max)	0.8 (0.5 – 1.0)
PEEP (Min – Max)	5 – 10

Conclusion:

The near-infrared spectroscopy and the measurement of $SctO_2$ does not reflect the reduction and drop down of the oxygenation status during OLV if normoxic conditions were maintained.

References:

1. British Journal of Anaesthesia 2009; 103:811–16
2. British Journal of Anaesthesia 2012; 108:623–9