European Society of Anaesthesiology and Intensive Care

Volume 39 | e-Supplement 60 | June 2022
www.ejanaesthesiology.com

# EJA

# European Journal of Anaesthesiology

Euroanaesthesia 2022
The European Anaesthesiology Congress

Abstracts Programme

Wolters Kluwer

ISSN 0265-0215

## 07AP02-02
## Oxygen titration with oxygen reserve index in minimal invasive pectus excavatum repair

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**Background and Goal of Study:** During minimally invasive repair of pectus excavatum (MIRPE), insufflation of carbon dioxide between the visceral and parietal pleura causes desaturation. It may be prevented by increased fractional inspired oxygen level ($FiO_2$) in the expense of hyperoxemia. Oxygen reserve index (ORI) is a noninvasive multi-wave pulse co-oximetry which shows the oxygenation status in the blood.

Our primary aim was to examine the value of ORI monitoring as an early predictor of hypoxemia during surgery. Our secondary aim was to measure value of ORI monitoring as guide of oxygen titration to prevent hyperoxemia and morbidity.

**Materials and Methods:** After Ethics Committee approval and parental consent, 128 patients aged 8-18 years who underwent elective MIRPE surgery between 2018-2019 at our hospital were enrolled prospectively.

The patients were randomized into 2 groups using the closed envelope method (n = 64 for each). The 1st group was control group with continuous peripheral oxygen saturation ($SpO_2$) measurement as standard. In the 2nd group, ORI was measured.

Patients were ventilated with $FiO_2$ 40% as standard practice, and when pneumothorax started $FiO_2$ increased to 60%, and continuously was increased by 20% more when necessary. Decrease of 0.05 from peak ORI after pneumothorax was considered as ORI decline and 1% decrease from $SpO_2$ value was accepted as $SpO_2$ decrease.

Pre-induction, pre-first and second pneumothorax, and postoperative ORI values, mean arterial pressure, temperature, end-tidal carbon dioxide level, demographics, length of hospital stay, anesthesia and surgery durations were recorded.

**Results and Discussion:** Desaturation time was 59.46 ± 15.57 seconds in the 2nd group according to ORI, while $SpO_2$ started to decrease in the 1st group after 177.64 ± 20.94 seconds ($P < 0.001$). The use of $FiO_2 \leq 60\%$ and > 60% at the end of surgery was significant between the groups. The length of hospital stay was higher in the 2nd group ($P = 0.002$).

**Conclusion(s):** ORI may detect hypoxemia earlier than $SpO_2$ monitoring in MIRPE surgery. Moreover, it also shortens the exposure time to hyperoxemia. We concluded that, ORI monitoring may increase patient safety during MIRPE surgery in pediatric patients.

## 07AP02-03
## The accuracy and precision of estimated continuous cardiac output monitoring after off-pump coronary artery bypass grafting

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**Background and goal of study:** The trend of modern medicine is 'do less invasively'. A completely non-invasive technology, estimated continuous cardiac output (esCCO), based on pulse wave transit time analysis has become clinically available since 2012. Previous version of esCCO software demonstrated moderate accuracy and precision compared with thermodilution technique.

The aim of our study was to evaluate the accuracy and precision of updated esCCO compared with calibrated pulse-contour analysis (CPCA) in patients after off-pump coronary artery bypass grafting (OPCAB).

**Materials and methods:** We enrolled 12 patients after elective OPCAB into a prospective study. Cardiac index measured by calibrated pulse-contour analysis ($CI_{CPCA}$) was calibrated by transpulmonary thermodilution using $PiCCO_2$ monitor (Pulsion/Getinge, Germany). The cardiac index registered by esCCO system ($CI_{esCCO}$) via KC-910P monitor (Nihon Kohden, Japan) was also calibrated using CI obtained from transpulmonary thermodilution.

Data were collected after ICU admission during 16-20 hrs of postoperative period using Data Acquisition System (Nihon Kohden, Japan) with parallel record of $CI_{esCCO}$ and $CI_{CPCA}$ every minute. Both technologies were recalibrated three times: at 2, 6 and 18 hrs after ICU admission and initial calibration.

**Results and discussion:** Totally, 7783 pairs of data were collected. We found significant correlation between $CI_{CPCA}$ and $CI_{esCCO}$ ($rho = 0.55$, $p < 0.01$). Bland-Altman analysis with multiple measurements per subjects for all collected data showed the mean bias between $CI_{esCCO}$ and $CI_{CPCA}$ was 0.005 L/min/m² with limits of agreement (LoA) of ± 1.02 L/min/m² and a percentage error of 36%.

A separate Bland-Altman analysis of data pairs with short and long periods of recalibration demonstrated better agreement between $CI_{esCCO}$ and $CI_{CPCA}$ in short recalibration periods with bias of -0.08 L/min/m², LoA of ± 0.71 L/min/m² and a percentage error of 29%.

Analysis of data pairs acquired during long recalibration period (between 6 and 18 hrs) revealed the bias of 0.01 L/min/m², LoA of ± 1.06 L/min/m² and a percentage error of 37%.

**Conclusion(s):** After off-pump coronary surgery, updated esCCO calibrated by transpulmonary thermodilution demonstrates acceptable accuracy and precision. More frequent recalibration may increase the accuracy and reproducibility of esCCO technology.