

POSTER PRESENTATION

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# Cerebral and somatic oxygen saturation in pediatric cardiac patients with delayed sternal closure

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## Introduction

Near-infrared spectroscopy offers non-invasive online monitoring of tissue oxygenation in a wide range of clinical scenarios.

## Objectives

The purpose of this study was to assess near-infrared spectroscopy-derived cerebral and somatic oxygen saturations (rSO<sub>2b</sub> and rSO<sub>2s</sub>) in children after cardiac surgery with delayed sternal closure (DSC). We hypothesized that rSO<sub>2b</sub> and rSO<sub>2s</sub> correlate with other indicators of hemodynamic compromise after DSC.

## Methods

We studied 43 postoperative children (median age, 8 days; range, 1-148 days) with DSC. The most common cardiac diagnosis was hypoplastic left heart syndrome (30%). rSO<sub>2b</sub> and rSO<sub>2s</sub> and other hemodynamic and metabolic parameters were analyzed on the day of surgery, 3 days after surgery (POD1-3), and prior to and 24 hours after DSC.

## Results

rSO<sub>2b</sub> increased at 12 hours ( $p = 0.0039$ ), and rSO<sub>2s</sub> did not change compared to data immediately after surgery. Deficit base decreased ( $p = 0.016$ ) and standard bicarbonates increased ( $p = 0.016$ ) on POD1, lactate decreased ( $p = 0.0001$ ) and diuresis increased ( $p = 0.013$ ) on POD2, heart rate decreased ( $p = 0.035$ ) on POD3. There was no change in systemic arterial blood pressure, left atrial pressure (LAP) and central venous pressure (CVP), arteriovenous oxygen saturation difference (a-vO<sub>2</sub> dif.), pH,

paO<sub>2</sub>, and paCO<sub>2</sub>. Vasoactive inotropic score was lower on POD2 and 3 compared to the day of surgery ( $p = 0.041$  and  $p = 0.048$ ). DSC resulted in an increase in LAP, CVP, a-vO<sub>2</sub> dif., and base deficit ( $p < 0.05$ ). Increase in LAP lasted 24 hours, other changes were present during 18 hours. rSO<sub>2b</sub> and rSO<sub>2s</sub> were lower at 1 - 6 hour and during 24 hours, respectively ( $p < 0.05$ ). There was no change in lactate levels. pH and standard bicarbonate were lower and vasoactive inotropic score was higher compared to preclosure values ( $p < 0.05$ ). rSO<sub>2b</sub> and rSO<sub>2s</sub> values did not correlate with lactate and a-vO<sub>2</sub> dif. values.

## Conclusions

In pediatric cardiac patients with left open chest rSO<sub>2b</sub> values increase on the day of surgery and rSO<sub>2s</sub> do not change. DSC is associated with a decrease in rSO<sub>2b</sub> and rSO<sub>2s</sub> that persists for 6 and 24 hours, respectively. rSO<sub>2b</sub> and rSO<sub>2s</sub> values do not correlate with other metabolic indicators of hemodynamic status.

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## References

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