

Changes in cerebral oxygenation during laparoscopic pyloromyotomy.

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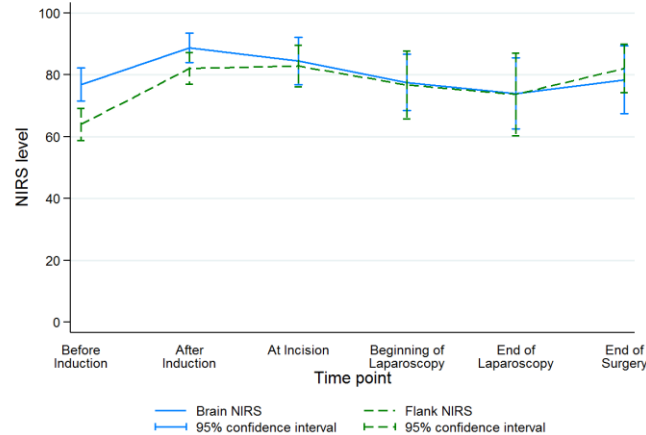
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Background

- Maintaining cardiac output and oxygen perfusion to the tissues is important during intraoperative care.
- While monitoring vital parameters such as blood pressure and heart rate are routine, there is interest in measuring cerebral and end-organ tissue oxygenation in various clinical scenarios.
- We analyzed cerebral and tissue oxygenation using near infrared spectroscopy (NIRS) in infants undergoing laparoscopic pyloromyotomy using cerebral and flank oximetry (rSO₂).
- The primary outcome of our study was to evaluate changes in cerebral and tissue oxygenation during abdominal insufflation for laparoscopy.

Methods

- The study received IRB approval.
- Infants ≤ 3 months of age undergoing laparoscopic pyloromyotomy were recruited for the study.
- Cerebral and tissue oxygenation were measured using NIRS.
- Average cerebral and tissue oxygenation levels were calculated prior to anesthetic induction, after induction, at incision, at the beginning of laparoscopy, at the end of laparoscopy, and at the end of surgery.
- Oxygenation levels at incision and at the end of laparoscopy were compared using a paired t-test.



Results

- The study cohort included 15 patients (10 male and 5 female) with an ASA status of I-III.
- Mean intra-abdominal pressure at the beginning of laparoscopy was 10 ± 3 mmHg.
- Changes in NIRS over the course of the procedure are shown in the Figure. Cerebral rSO₂ before induction was 77 ± 9 and tissue rSO₂ was 64 ± 9.
- After anesthetic induction, cerebral rSO₂ was 89 ± 9 and declined significantly to 74 ± 21 after laparoscopy (CI difference: 3, 26; P=0.016).
- Tissue rSO₂ showed a non-significant decline from 82 ± 9 after induction to 74 ± 24 after laparoscopy (CI difference -5, 21; P=0.184).

Discussion

- Cerebral oxygenation decreased significantly between the time after anesthetic induction and the end of laparoscopy.
- Nadir cerebral oxygenation was only 1% below that noted in the awake state prior to anesthetic induction.
- Tissue oxygenation showed no significant change.
- Increase in intra-abdominal pressure may increase systemic and pulmonary vascular resistance thereby decreasing cardiac output and oxygen delivery.
- The nadir values for cerebral oxygenation were similar to those at baseline prior to the increase that occurred after anesthetic induction.

