

# Perioperative hypoxemia and postoperative respiratory events in infants with hypertrophic pyloric stenosis

*F.A.I.M. van den Bunder<sup>1</sup>, M.F. Stevens<sup>2</sup>, J.B. van Woense<sup>3</sup>, T. van de Burg<sup>4</sup>, L.W.E. van Heurn<sup>1</sup>, J.P.M. Derikx<sup>1</sup>*

<sup>1</sup>Emma Children's Hospital, Amsterdam UMC, University of Amsterdam and Vrije Universiteit Amsterdam, Department of Pediatric Surgery, Amsterdam, Netherlands, <sup>2</sup>Amsterdam UMC, University of Amsterdam, Dept of Anaesthesiology, Amsterdam, Netherlands, <sup>3</sup>Emma Children's Hospital, Amsterdam UMC, University of Amsterdam, Pediatric Intensive Care Unit, Amsterdam, Netherlands, <sup>4</sup>Amsterdam UMC, Vrije Universiteit Amsterdam, Department of Epidemiology and Data Science, Amsterdam, Netherlands

**Learning Track:** 5: Paediatric Anaesthesiology

**Abstract text: Background and goal of study:** Normalization of metabolic alkalosis by intravenous fluid therapy is an important pillar in the treatment of infantile hypertrophic pyloric stenosis (IHPS) because it is thought that uncorrected metabolic alkalosis may lead to perioperative respiratory events. We aimed to study the incidence of perioperative hypoxemia and postoperative respiratory events in IHPS and the potential role of metabolic alkalosis.

**Materials and methods:** We retrospectively reviewed all patients undergoing pyloromyotomy between 2007-2017 in two paediatric surgical centres. All infants received intravenous fluids preoperatively to correct metabolic abnormalities close to normal. We assessed the incidence of perioperative hypoxemia (defined as SpO<sub>2</sub> <90% for >1min) and postoperative respiratory events. Additionally, the incidence of difficult intubations was evaluated. We performed a multivariate logistic regression analysis to evaluate the association between admission or preoperative serum pH values, bicarbonate or chloride and peri- and postoperative hypoxemia or respiratory events.

**Results and discussion:** The majority of 406 included infants was male (N=345, 85.0%). Median [IQR] age was 34 [19] days; 213 infants underwent laparoscopic pyloromyotomy (52.5%) and 193 infants open pyloromyotomy (47.5%). In total, 208 infants (51%) developed ≥1 episode of hypoxemia during the perioperative period, of whom 130 (32%) during induction, 43 (11%) intraoperatively, and 112 (28%) during emergence. The attending pediatric anesthetist classified 25 out of 333 intubations (7.5%) as difficult and 17 infants required ≥3 attempts. We noticed 95 postoperative respiratory events, of whom three patients developed respiratory insufficiency. We did not find a clinically meaningful association between admission or preoperative laboratory values reflecting metabolic alkalosis and respiratory events.

**Conclusions:** IHPS frequently leads to peri- and postoperative hypoxemia or respiratory events and high incidence of difficult tracheal intubations. Preoperative pH, bicarbonate and chloride are bad indicators for perioperative hypoxic episodes.

**1st Keyword:** Anaesthesia, paediatric

**2nd Keyword:** Complications, respiratory

**3rd Keyword:** Complications, apnoea

**Abstract type: case report:** 2

**Abstract type: case report:** 2

**Ethical Research:** I hereby confirm that an Institutional Review Board (IRB), Independent Ethics Committee (IEC), Ethical Review Board (ERB) deemed the study exempt from review.

**Institution:** The Medical Ethic Review Committee of VU University Medical Center

**Name of the Ethical Committee Chair:** Prof. Dr. C. De Boer

**Exemption reference:** 2018.210

**Date of exemption:** June 12th, 2018

**I hereby confirm that the written consent has been received from the patient:** No

**I hereby confirm that the institutional standards for animals have been reached.:** No

**I hereby confirm that I have been informed and agree with that ESAIC contacting the above mentioned IRB/IEC/ERB in order to inspect this review.:** Yes

**I hereby confirm that the Ethical Declaration is not required.:** No

**Conflict of interest to declare?:** No

**I confirm that I previewed this abstract and that all information is correct. I accept that the content of this abstract cannot be modified or corrected after final submission and I am aware that it will be published as submitted. The corresponding author is responsible for informing the other authors about the status of the abstract:** Yes

**The work in the abstract should not be presented at any large English-speaking meeting before the Euroanaesthesia 2022 Congress, nor should the work appear in another format at any other international English-speaking meeting.**

**The work has not been published before the Euroanaesthesia 2022 Congress, in whole or in abstract, in an indexed journal.**

**The presentation will be unbiased, based on the best available evidence and all elements of the presentation will be free from the control of commercial interests.:** Yes

**In consideration of the European Society of Anaesthesiology and Intensive Care taking action in reviewing and editing the submission, the author(s) transfer, assign, and otherwise convey copyright of ownership in said work to the European Society of Anaesthesiology and Intensive Care in the event said work is published by the Society. This copyright assignment applies only to the abstract submitted and does not apply to, or prevent, subsequent publication elsewhere of a full manuscript relating to the subject matter of such abstract:** Yes

**If the abstract is accepted, the author commits him/herself to present his/her work at the Euroanaesthesia 2022. Presenters of accepted abstracts must preregister for the congress before 30 March 2022 (23:59, CET). Abstract(s) will not be published in Euroanaesthesia 2022 related publications (the e-supplement of the European Journal of Anaesthesiology, abstract publication website and online Final Programme) and will be rejected for presentation at Euroanaesthesia 2022 if the presenter fails to register before 30 March 2022 (23:59, CET).:** Yes

**If an individual submits multiple abstracts and more than one abstract is accepted for presentation, the ESAIC will attempt to schedule the presentations to prevent time conflicts for the presenter. Because of the complexity of scheduling the large number of accepted abstracts, some conflicts in presentation times may be unavoidable. If a scheduling conflict occurs, the original abstract presenter is responsible for selecting a co-author to present the abstract. The new abstract presenter should clearly understand the study and the abstract and should [register for the congress on time](#).:** Yes

**If a submitted abstract must be withdrawn, written withdrawal request must be submitted to the ESAIC Secretariat ([abstracts@esaic.org](mailto:abstracts@esaic.org)) by e-mail originating from the presenter's e-mail address. This notice must clearly mention: Abstract submission number; title and presenter contact data; reason(s) for withdrawal of the abstract and attest that all authors are in agreement that the abstract must be withdrawn. An abstract is considered withdrawn as soon as the written confirmation of its withdrawal is received from the organisers. If such a confirmation is not received within 3 working days after the request has been sent, the abstract presenter should contact the ESAIC Secretariat ([abstracts@esaic.org](mailto:abstracts@esaic.org)).:** Yes

**If the presenter of an accepted abstract has not registered by 30 March 2022 (23:59, CET), his abstract will be withdrawn by the ESAIC and removed from all Euroanaesthesia 2022 related publications (abstract e-book, abstract publication website(s) or online Final Programme).**

**If the presenter has registered but decides to withdraw the submitted abstract(s) after 30 March 2022 (23:59, CET), the ESAIC will not be able to withdraw the abstract from the above-mentioned publications.:** Yes