

AAP DISTRICT VIII SECTION ON NEONATAL PERINATAL MEDICINE

**2021 ANNUAL CONFERENCE ORIGINAL RESEARCH (BASIC SCIENCE or CLINICAL)
ABSTRACT SUBMISSION FORM**

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Date: February 19, 2021

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DEADLINE FOR RECEIPT OF ABSTRACT IS FEBRUARY 19, 2021. Submissions will be accepted for either poster or oral presentation. Authors will be notified of acceptance and format for presentation (poster or poster symposium) by **March 12, 2021.**

Title: Fluid overload in newborns undergoing abdominal surgery

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Background: Infants undergoing abdominal surgery, particularly those born preterm, are at risk of postoperative fluid overload and acute kidney injury due to immature cardiac and renal functions, which could contribute to increased morbidity and mortality.

Objective: The purpose of this study was to evaluate the burden of fluid overload and acute kidney injury among newborns undergoing abdominal surgery and the association with adverse neonatal outcomes.

Methods: Newborns who had undergone laparotomy from January 2017 to June 2019 admitted to a tertiary level Neonatal Intensive Care Unit were included in this retrospective cohort study. Fluid overload was assessed by the maximum percentage change in body weight and the difference between actual and prescribed fluid intake post-operatively. Acute kidney injury was defined as an increase in serum creatinine >1.5 times of baseline or >26 mmol/L, or oliguria (<0.5mL/kg/hr over 24-hour).

Results: There were 60 eligible infants with medians [IQR] gestational age (GA) and birth weight being 29 weeks [25–36] and 1240 grams [721–2871], respectively. Indications for laparotomy included small bowel obstruction (45%), necrotizing enterocolitis (23%), and large bowel obstruction (11.7%).

In the first three post-operative days, 24/60 (40%) required inotropes, 5/59 (8.5%) had hyponatremia (<130 mmol/L), and 15/31(48.4%) developed hypoalbuminemia (<20 g/L). 52/60 (86.7%) infants had serum creatinine measured and 4 (6.7%) fulfilled our AKI criteria.

The median of actual fluid intake was significantly higher than the prescribed fluid intake in the first 7 post-operative days ($p<0.01$) [Figure 1].

Medians [IQR] of maximum % change of body weight within the first 3- and 7-days post operation were 6 [3–13] and 11 [5 –17], respectively. While we did not identify any associations between post-operative fluid overload and mortality/bronchopulmonary dysplasia in this cohort, we found that every 1% increase in weight gain within the first 3 days post-operation were associated with an increase in 0.6 day of invasive ventilator support ($p=0.012$) [Figure 2]. Such correlation still exists after adjusting for GA ($p=0.033$).

Conclusion(s): In our cohort of newborns undergoing abdominal surgery, weight gain within the first 3 post-operative days was associated with an increase in duration of invasive ventilator support. Fluid overload does not seem to be associated with acute kidney injury. Careful attention to intra and early postoperative fluid balance may play an important role in optimizing outcomes of newborns undergoing abdominal surgery

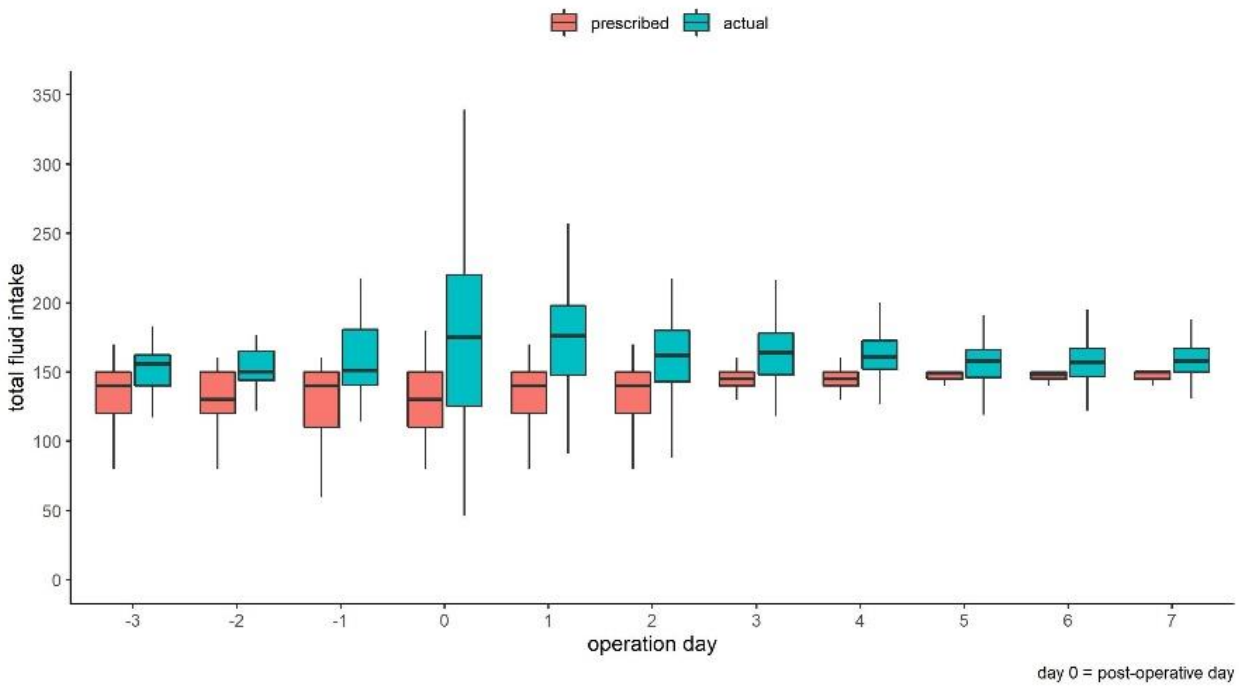


Figure 1: prescribed versus actual total fluid intake

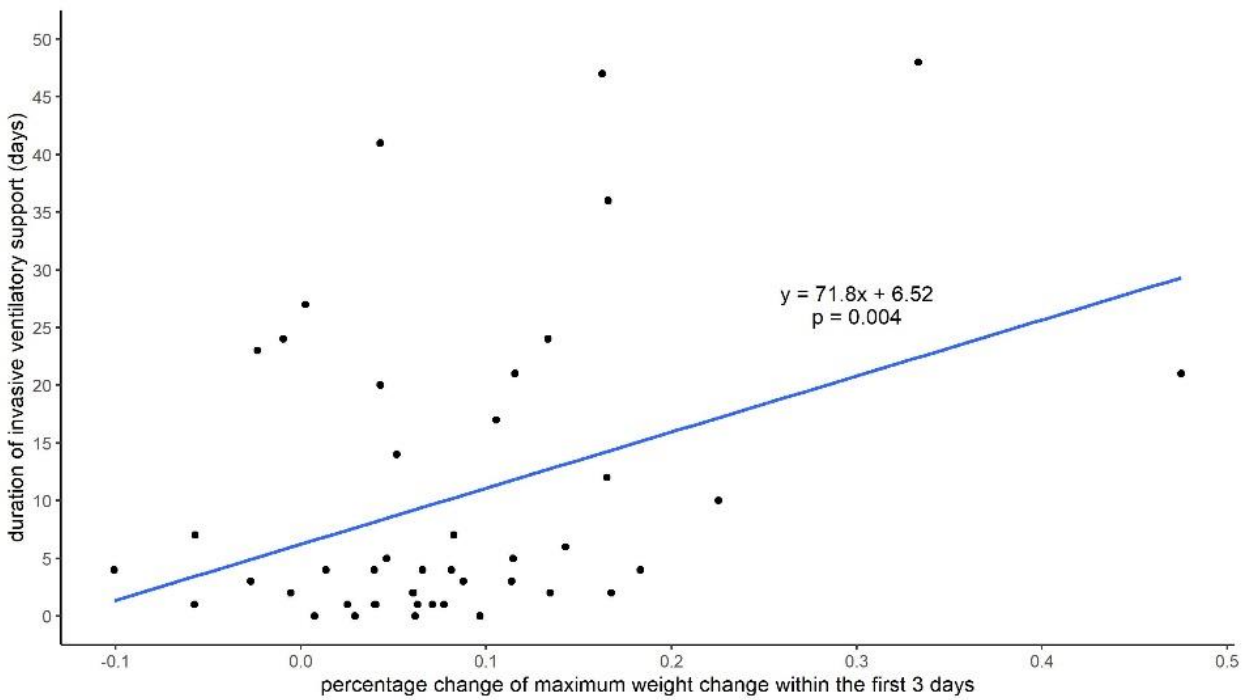


Figure 2: correlation between weight change within 3-day post-op and duration of invasive ventilator support