

### **Impact of Intraoperative Hypothermia on Blood Loss and Transfusion Requirements in Patients with Pelvic and Acetabular Trauma**

*Adam Boissonneault, MBChB; Rahul Kant Goel, MD; Andrew Michael Schwartz, MD; Sona Arora, MD; Mara Lynne Schenker, MD  
Emory University, Atlanta, GA, United States*

**Purpose:** The aim of this study was to explore the association between intraoperative hypothermia and perioperative blood loss and transfusion requirements in patients with intrapelvic trauma.

**Methods:** This retrospective study includes 374 consecutive patients that presented to a single Level-I trauma center for surgical fixation of an acetabular or pelvic ring injury. Patient temperature was recorded in degrees Celsius (°C) and intraoperative hypothermia was defined as a temperature less than 36.5°C at the completion of procedure prior to extubation. Primary outcome measures included estimated blood loss (EBL), postoperative day 1 (POD1) drain output (mL), and rate of postoperative packed red blood cell (PRBC) transfusion. Covariates used in our regression models included admission hemoglobin level (Hb, mg/dL), preoperative PRBC transfusion requirement, admission acidosis defined at base excess (BE) less than -5.0, and ISS.

**Results:** The mean age of the cohort was 39 years (range, 16-87). There were 100 acetabular fractures, 234 pelvic ring injuries, and 40 combined injuries. Among the entire cohort, 41 patients (11%) were found to have intraoperative hypothermia and 118 (32%) required a postoperative blood transfusion. Compared to controls, patients with intraoperative hypothermia had a significantly higher EBL, 406 mL versus 296 mL ( $P = 0.019$ ), and significantly higher POD1 drain output, 197mL versus 132mL ( $p=0.002$ ). There was also a significant association between intra-operative hypothermia and post-operative transfusion requirement ( $p=0.016$ ). The rate of postoperative blood transfusion was 42% for patients with intraoperative hypothermia compared to 28% for controls. Regression analyses revealed that patients with intraoperative hypothermia were almost twice as likely to require a postoperative transfusion (odds ratio [OR] 1.8;  $P = 0.017$ ); however, this relationship became nonsignificant after controlling for admission Hb level, preoperative transfusion, and ISS ( $P = 0.217$ ). In a subgroup analysis of patients with admission acidosis, the rate of postoperative transfusion remained significantly increased to over 4 times as likely when intraoperative hypothermia was present, even after controlling for admission Hb, ISS, and rate of preoperative transfusion (OR 4.4;  $P = 0.018$ ).

**Conclusion:** For patients with intrapelvic trauma who present with an admission acidosis, intraoperative hypothermia is an independent risk factor for increased postoperative blood transfusion requirement. This information is clinically important given the modifiable nature of intraoperative patient temperature and the known complications and sequelae associated with increased transfusion rates.