

**PREDICTIVE INDICATORS OF HYPONATREMIA IN ADULT
PRE-OPERATIVE TRAUMA PATIENTS**

Tomas H. Jacome, Jr., MD
Director Trauma Program
Our Lady of the Lake Hospital, Inc.

Susan Steele-Moses, DNS, APRN-CNS, AOCN
Clinical Research Director
Our Lady of the Lake Hospital, Inc.

Danielle M. Tatum, PhD
Academic Research Director, Trauma
Our Lady of the Lake Hospital, Inc.

Hollis "Bud" Oneal
Research Medical Director
LSU Health Sciences Center

Background: Hyponatremia has been linked to increased mortality in patients with a variety of medical conditions. Leung et al. (2012) also linked hyponatremia as a predictive indicator for peri-operative 30-day morbidity and mortality; however there is limited knowledge related to predictive indicators of hyponatremia in pre-operative trauma patients.

Hypothesis: There are prognostic indicators which predict the occurrence of hyponatremia in adult pre-operative trauma patients.

Methods: A retrospective cohort study was conducted using our Trauma Registry to identify 2911 adults undergoing major trauma surgery. Pre-existing conditions consistent with hyponatremia were determined a priori, which included CHF, diabetes, and renal failure. We used logistic regression to estimate relative risk for hyponatremia based on the presenting pre-existing and demographic indicators.

Results: Among patients with hyponatremia [< 135 mEq/L), $n = 217$; 7.5%], the majority were female ($n = 129$; 59.4%), Caucasian ($n = 188$; 86.6%) with a mean age of 65.50 (SD=17.94). The normonatremia group ($n = 2679$; 92.0%) was predominately male ($n = 1439$; 53.7%), Caucasian ($n = 1898$; 70.8%) with a mean age of 53.43 (SD=22.36). Variables associated with hyponatremia included ISS ($r^2 = .406$; $p < .001$), gender ($r^2 = .091$; $p < .001$), race ($r^2 = .096$; $p < .001$), age ($r^2 = -.123$; $p < .001$), history of diabetes ($r^2 = .113$; $p < .001$), history of hypertension ($r^2 = .126$; $p < .001$), and a history of other pre-existing conditions ($r^2 = .166$; $p < .001$). Based on a logistic regression, the final model (Nagelkerke $r^2 = .145$) consisted of four predictive indicators ISS (Exp $\beta = 2.046$; $p = .004$); race (Exp $\beta = .159$; $p = .050$), a history of hypertension (Exp $\beta = 1.580$; $p = .003$), in the presence of other pre-existing conditions (Exp $\beta = 1.580$; $p = .003$).

Conclusions: In trauma patients who are Caucasian and present with a history of hypertension, multiple co-morbidities with a lower ISS score; hyponatremia should be resolved pre-operatively to improve outcomes.