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Geographic variation in Transient Ischemic Attack (TIA)/minor stroke care in Alberta emergency departments (EDs)

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Introduction: The risk of recurrent stroke following a transient ischemic attack (TIA) has been estimated to be as much as 5 percent in the first 48 hours and ten percent in the first week following initial TIA symptoms, but can be modified as a result of intensive risk factor management. Care pathways for these patients vary between different regions within Alberta with Edmonton admitting more TIA patients and Calgary using computed tomography angiography (CTA) based triage. To examine regional differences in the quality of care, the rate of admission for stroke within 90 days of an index ED visit for TIA/minor stroke was investigated. **Methods:** Data analysts from the Data Integration, Measurement and Reporting (DIMR) branch of Alberta Health Services (AHS) used the National Ambulatory Care Reporting System (NACRS) to identify patients in Alberta who were admitted for stroke within 90-days of an index emergency department (ED) visit for TIA/minor stroke from April 2010 to March 2016. Information extracted included patient demographics, region of residence (Edmonton, Calgary or non-major urban [NMU]), return diagnosis and timing of return ED visit. Analysis included descriptive summaries and proportions were compared using a χ^2 test. **Results:** During the study period, there were 26,232 index visits to Alberta EDs for TIA/minor stroke. 5426 (26.1%) of patients were admitted on their index visit. Calgary (22.5%) had lower rates of admission on index visit followed by Edmonton (31.4%) and the NMU (46%). 20,806 (79.3%) were discharged home following their index visit. Of the patients discharged on their index visit 729 (3.5%) had an admission for stroke within 90-days of their index ED visit with rates in Edmonton (3.8%) and the NMU regions (3.8%) being significantly higher than Calgary (2.8%, $p < 0.01$). **Conclusion:** Our study demonstrates significantly lower rates of admission for stroke within 90-days of ED visit for minor stroke/TIA in Calgary compared to Edmonton and the NMU. Further work should focus on validating this result and consideration of standardized care pathways that promote effective resource utilization and quality of care.

Keywords: transient ischemic attack, minor stroke, epidemiology

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Systolic blood pressure is a strong predictive marker for TIA and mild stroke in younger patients

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Introduction: Age and systolic blood pressure (SBP) are important predictors of Acute Cerebrovascular Syndrome (ACVS). Yet, the effect of SBP is confounded by age, making its independent contribution to ACVS risk difficult to quantify. Here we use logistic regression to explore the role of SBP in younger and older ED patients. **Methods:** Data comprised 1019 ED patients (ACVS 70%, 30% non-ACVS) enrolled during a 28-month period of an ongoing prospective, observational, multi-site stroke biomarker study (SpecTRA). We used logistic regression to examine the effects of age, sex, and the age:SBP interaction as predictive markers of the diagnosis of ACVS. **Results:** Participants (53% male) ranged in age from 18 to 97 years (Q1 = 58, median = 70, Q3 = 80). SBP ranged from 84 to 248 mmHg (Q1 = 137, median = 154, Q3 = 174). In our initial regression model, age, sex, SBP and the age:SBP interaction were all significant ($p < 0.01$). Using cubic regression splines for age, sbp and their interaction yields the same conclusion ($p < 0.01$). To better understand the role of SBP in younger vs. older patients, we stratified the sample at the median age (70 years of age). In the younger group (n = 510), participants were 55% male, 60% ACVS, and had SBP ranging from 91 to 236 mmHg (Q1 = 133, median = 148, Q3 = 165). In the older group (n = 509), participants were 51% male, 82% ACVS and had SBP ranging from 84 to 248 mmHg (Q1 = 143, median = 159, Q3 = 179), a shift of approximately 10 mmHg between the groups. The logistic regression model was then fit separately to each group without the age:SBP interaction term. In the younger group, we found SBP to be highly significant ($p < 0.001$), with an odds-ratio (OR) of 1.18 per 10 mmHg (95% CI: 1.10-1.29). In the older group, we found that SBP was not significant ($p = 0.91$), with an OR of 1.00 per 10 mmHg (95% CI: 0.91-1.08). Age and sex were also significant risk factors in the younger group (each $p < 0.01$), though not in the older group (both $p > 0.07$). **Conclusion:** Our findings suggest that for ED patients suspected of ACVS, SBP is a clinically relevant predictor for younger patients, with higher SBP associated with an increased risk of ACVS, regardless of patient age and sex. SBP does not appear to be a strong predictor for patients over 70. ED physicians can leverage this finding by attributing greater importance to elevated SBP in younger patients than older patients when working toward a clinical suspicion of ACVS.

Keywords: acute cerebrovascular syndrome, blood pressure, clinical decision support

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External validation of the BIG score to predict mortality in pediatric blunt trauma

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Introduction: The BIG score is a new pediatric trauma score composed of the admission base deficit (BD), the international normalized ratio (INR) and the Glasgow Coma Scale (GCS). A score < 16 identifies children with a high probability of survival following blunt trauma.The objective of this study was to measure the criterion validity of the BIG score to predict in-hospital mortality among children visiting an emergency department with blunt trauma requiring an admission to the intensive care unit. **Methods:** This was a retrospective cohort study performed in a single tertiary care pediatric hospital between 2008 and 2016. Participants were all children (<18 years) visiting the emergency department for a blunt trauma requiring intensive care unit admission or who died at the emergency department. All charts were reviewed by a member of the research team using a standardized report form. To insure quality of data abstraction, 10% of the charts were reviewed in duplicate by a second rater blinded to the first evaluation. The primary outcome was in-hospital mortality. Baseline demographics, initial components of the BIG score, Injury Severity Score (ISS) and disposition were extracted. The primary analysis was the association between a BIG score ≥16 and in-hospital mortality. It was calculated that the inclusion of at least 25 deaths would provide confidence intervals of +/- 0.20 for proportions in the worst-case scenario. **Results:** Twenty-eight children died among the 336 who met the inclusion criteria. The inter-rater agreement for data abstraction was excellent with kappa scores or intraclass correlation coefficients higher than 0.8 for all variables. Two hundred eighty-four children had information on the three components of the BIG score and they were included in the primary analysis. A BIG score ≥16 demonstrated a sensitivity of 0.93 (95%CI: 0.76-0.98) and specificity of 0.83 (95%CI 0.78-0.87) to identify mortality. Using ROC curves, the area under the curve was higher for the BIG score

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