Introduction: National guidelines (NICE, AHA) for management of Acute Cerebrovascular Syndrome (ACVS) in the Emergency Department (ED) recommend the use of ABCD2 score to risk stratify patients despite its poor specificity and low diagnostic accuracy. The SpecTRA project previously developed a clinical classifier for ACVS vs. Mimic derived from historical clinical data collected during a 5-year period at an outpatient stroke clinic (Victoria, BC). Here we present a prospective evaluation of the performance of our clinical classifier on prospectively collected ED patient data compared to the industry-standard ABCD2. **Methods:** The prospective cohort consisted of ED patients (N = 555, Male = 54%, Mean (SD) Age = 68.7(15.5), ACVS = 70%) enrolled between Jan 2014 and May 2015 at Victoria General Hospital (BC) and Foothills Medical Centre (Calgary, AB). ABCD2 and clinical classifier scores were calculated from clinical data from the ED. We compared the performance of the two classifiers using DeLong's test of Dependent Receiver Operating Curves (ROC). In keeping with national guidelines, we used a score of 4 or more to assess sensitivity, specificity and accuracy (sens/spec and acc) of the ABCD2; for our clinical classifier, we used the cut point previously determined to maximize agreement between predictions and true class labels in the historical data. **Results:** Our new clinical classifier significantly outperformed the ABCD2 ($z = 2.44$, $p = 0.015$) with an AUC of 0.72, (95% CI: 0.68, 0.77) vs. 0.66 (0.61, 0.71). In terms of sens/spec and acc, our classifier achieved 0.78/0.55 with acc 71% compared to 0.75/0.46 with acc 66% for the ABCD2 (using the previously specified cut points). **Conclusion:** Our ACVS clinical classifier showed better performance than the ABCD2 score on a prospective sample of ED patients. The improved specificity of the clinical classifier relative to existing prognostic tools would reduce the number of non-ACVS patients referred for early treatment as well as conserve medical resources. Our ongoing multi-site study will evaluate the utility of the ACVS classifier embedded in a logic-enabled e-fillable form. This form will also provide risk-based thresholds guiding timely ordering of CTA as well as links to clinical treatment guidelines. Longer-term, the e-form and classifiers will be further enhanced to include plasma-based protein biomarker data.

Keywords: acute cerebrovascular syndrome, clinical decision rule, transient ischemic attack (TIA)

LO012

High-risk investigation findings for symptomatic carotid disease in ED TIA patients

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Introduction: About 20% of TIAs are due to large vessel disease. Carotid stenosis >50% which is causing a TIA or stroke needs to be definitely managed quickly in order to benefit. Alternatively, dual antiplatelet therapy may be considered. The objective of this study was to determine high-risk diagnostic findings associated with symptomatic carotid disease in ED patients with TIA to indicate patients requiring urgent carotid imaging. **Methods:** We performed a prospective Canadian multicenter cohort study, at 13 academic sites, of ED patients with TIA or non-disabling stroke from 2006-2014. Study research nurses recorded imaging findings on standardized data collection forms from the final reports of all imaging tests ordered in the ED on prospectively enrolled patients by treating emergency physicians. Symptomatic carotid disease was defined as carotid stenosis 50-99% or carotid dissection and was adjudicated by stroke neurology to be the etiology of the index event. Patients were followed by medical review and telephone up to 90 days. Univariate analysis was conducted for investigation results with our primary outcome. **Results:** The cohort included 305 patients with and 5,277 without symptomatic carotid disease. Positive predictors of symptomatic carotid disease included platelet count over 400 x 10^9/L (15.3% vs 7.6%; $p = 0.0095$), blood glucose >15 mmol/L (11.4% vs 4.4%; $p < 0.0001$), CT evidence of acute infarction (9.8% vs 4.1%; $p < 0.0001$), CT evidence of old infarction (35.7% vs 24.1%; $p < 0.0001$), and CT evidence of any infarct (43.3% vs 26.7%; $p < 0.0001$). There were no negative predictors of symptomatic carotid disease. **Conclusion:** High-risk investigation findings suggestive of symptomatic carotid disease in ED TIA patients include platelet count over 400 x 10^9/L, blood glucose >15 mmol/L, CT evidence of any infarction. Patients with any of these findings should be considered for rapid carotid imaging.

Keywords: transient ischemic attack (TIA), diagnostic imaging, carotid stenosis

LO013

Can you trust administrative data? Accuracy of ICD-10 codes for diagnosis of pulmonary embolism

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Introduction: Administrative data is a useful tool for research and quality improvement; however, the validity of research findings based on these data depends on their reliability. Diagnoses are recorded using diagnostic codes, as defined by the International Statistical Classification of Diseases and Related Health Problems, 10th Revision (ICD-10). Several groups have reported coding errors associated with ICD-10 assignments to patient diagnoses; these errors have serious implications for research, quality improvement, and policymaking. As part of a quality improvement project targeting emergency department (ED) diagnostic appropriateness for pulmonary embolism (PE), we sought to validate the accuracy of ICD-10 codes for studying ED patients diagnosed with PE. **Methods:** Hospital administrative data for adult patients (age ≥18 years) with an ICD-10 code for PE (I26.0 and I26.9) were obtained from the records of four urban EDs between July 2013 to January 2015. A review of medical records and imaging reports was used to confirm the diagnosis of PE. In the case of discrepancy between ICD-10 coding and chart review, the diagnosis obtained from chart review was considered correct. The physicians' discharge notes in the administrative database were also searched using 'pulmonary embolism' and 'PE', and patients who were diagnosed with PE but not coded as PE were identified. Coding discrepancies were quantified and described. **Results:** 1,453 ED patients had a PE ICD-10 code during our study period. 257 (17.7%) of these patients' diagnoses were improperly coded. 211 patients assigned an ICD-10 PE code had ED discharge diagnoses of 'rule-out PE' or 'query PE'. 64 other patients were miscoded as having a PE and should have been assigned an alternate code, such as chest pain, hypoxia, or dyspnea. The physician did not include a discharge diagnosis in 4 of the 64 miscoded patients; however, triage and physician assessment notes indicated no suspicion of PE. Furthermore, 117 patients who had an ED discharge diagnosis of PE were not assigned a PE code, meaning that 8.91% of true PEs were missed by using ICD-10 codes alone. Thus, 1,313 ED patients truly had a PE. **Conclusion:** Our work suggests the need for more accuracy in ICD-10 coding of ED diagnoses of PE. Caution should be exercised when using administrative data for studying PE, and validation of the accuracy of ICD-10 coding prior to research use is recommended.

Keywords: pulmonary embolism, ICD-10