65 | Increased Use of Computed Tomographic Cerebral Angiography vs. Lumbar Puncture for Headache Workups: 2015–2021

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Background and Objectives: Lumbar puncture (LP) is considered the gold standard to rule-out a diagnosis of aneurysmal subarachnoid hemorrhage (aSAH). In 2018, American College of Emergency Physicians guidelines supported the use of either LP or computed tomographic cerebral angiography (CTCA) as a secondary investigation (after non-contrast cranial computed tomography [NCCT]) to exclude aSAH. We explored whether there has been a recent shift in the use of CTCA compared to LP amongst emergency department (ED) patients presenting with headache, and if any change in diagnostic practice was associated with cerebral aneurysm diagnoses.

Methods: Retrospective cohort study of 286,704 ED visits for headache within an integrated health care delivery system in Northern California between 2015–2021. The primary exposure was NCCT during the ED encounter, with secondary exposures of LP and/or CTCA. The primary outcome was a diagnosis of cerebral aneurysm within 14 days following the ED visit. Annualized differences in CTCA to LP ratio were analyzed using Cuziak's test for trend and the association between CTCA to LP ratio and cerebral aneurysm diagnoses was assessed using Pearson's correlation coefficient (r).

Results: Of 286,704 ED visits for headache, NCCT was performed in 32% (annual range 27%–37%), CTCA in 3.5% (annual range 1.9%–5.1%) and LP in 2.6% (annual range 1.8%–3.4%). Among visits with NCCT, CTCA was performed in 9.9% (annual range 5.9%–13%) and LP in 5.9% (annual range 3.8%–8.9%). While the use of second-line investigations following NCCT remained relatively constant (annualized range 14%–16%), the ratio of CTCA to LP performance increased every year and 5-fold overall (from 0.7 in 2015 to 3.4 in 2021, $p = 0.014$). However, there was no significant correlation between the CTCA to LP ratio and cerebral aneurysm diagnoses (overall cohort r=0.63, $p = 0.13$; NCCT-only r=0.61, $p = 0.15$).

Conclusion: The use of CTCA relative to LP as a second-line investigation in the ED for headache has increased nearly 5-fold in recent years. While there is debate concerning the appropriateness of using CTCA as second-line investigation to exclude aSAH owing to cost, radiation exposure, suboptimal sensitivity, and incidental diagnoses of cerebral aneurysms (which have an estimated prevalence of 3%–4%), we found no statistically significant association between increased use of CTCA and diagnoses of cerebral aneurysms in this population.

66 | Acute Stroke Assessment by Emergency Medicine Residents Does Not Affect Key Stroke Metrics

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Background and Objectives: The National Institutes of Health Stroke Scale (NIHSS) is a 15-item neurologic assessment often used in community emergency departments across the country, but commonly conducted by neurology residents at academic hospitals. We aimed to see if a stroke quality improvement intervention could improve EM residents' comfort with the NIHSS and stroke decision making. We also compared acute stroke metrics, including door-to-CT (DTCT), door-to-needle (DTN), and door-to-groin puncture (DTGP) times before and after our intervention.

Methods: All patients with ischemic strokes at Zuckerberg San Francisco General Hospital Emergency Department, a public safety net hospital, from April 2021–October 2022 were analyzed. Our intervention was implemented in April 2022 and included NIHSS certification for all EM PGY 2–4 residents and attendings. A pre- and post-intervention survey assessed EM residents' comfort in conducting the NIHSS and making the decision for IV-tPA or endovascular therapy. A 6 month pilot included blinded NIHSS assessments, documented by both EM and neurology residents, and comparison of NIHSS scores after both scores were submitted. Outcomes including DTCT, DTN, and DTGP times were compared for all strokes. DTCT times greater than 8 h and DTN and DTGP times greater than 6 h were excluded from analysis. Categorical data were analyzed using Chi-square or Fisher's exact tests. Continuous data were analyzed using Wilcoxon rank-sum tests.

Results: Our analysis included 369 ischemic strokes ($n = 247$ pre-intervention and $n = 122$ post-intervention). 42% of all patients were female. 33% of all patients were Asian, Pacific Islander. The most common languages include English (59%), Chinese (15%), and Spanish (14%). Median times for pre- and post-intervention was 25 min (IQR = 18, 74) and 28 min (IQR = 20, 65) for DTCT, 38 min (IQR = 26, 56) and 35 min (IQR = 30, 48) for DTN, and 94 min (IQR = 80, 114) and 110 min (IQR = 99, 138) for DTGP, respectively. There was no statistically significant difference between the pre- and post-intervention times.

Conclusion: Implementation of a 6-month pilot in which EM residents assessed the NIHSS did not impact DTCT, DTN, and DTGP times when compared to neurology residents. Our findings suggest that EM residents are able to primarily assess acute ischemic strokes without prolonging time to key imaging, administration of IV-tPA or embolectomy.