Abstract

Effective and timely care of the adult patient experiencing stroke symptoms is essential to limit patient mortality and morbidity. This care requires collaboration from multidisciplinary team members and adherence to national guidelines and protocols. Nationally, there is an observed gap in adherence to these standards, especially for stroke alerts that occur in the inpatient setting. Factors associated with guideline non-compliance and the implementation of Dartmouth-Hitchcock Medical Center’s (DHMC) current in-hospital stroke alert process remained unclear.

Introduction

Sadly, one of the worst places for a patient to have a stroke is while admitted to a hospital. Approximately 4% to 17% of all strokes have onset of symptoms while hospitalized. The purpose of this study was to evaluate the current stroke alert process of admitted adults and to identify patterns of care and gaps in practice, leading to recommendations for improvement of inpatient stroke alerts both institutionally and nationally.

Methods

This quality improvement study utilized a retrospective chart review to evaluate pre-recorded, patient-centered data to describe the current process of adult inpatient stroke alerts at a major tertiary-care academic medical center and the adherence to current national guidelines provided by the AHA. Numerous pre-identified variables were collected surrounding the stroke alert process of each patient via chart review. This project followed a quantitative descriptive design. Inclusion criteria: all adult (age ≥18 years old) inpatient stroke alerts activated within six days at DHMC. 78 charts were identified but only 74 charts had full data completion for use in this study. There are no exclusion criteria. Descriptive and comparative statistics were used to describe findings and compare results against the institutional-based protocols and national guidelines.

Objectives

- Assess the proportion of in-hospital stroke alerts that did not meet each of the individual American Stroke Association (ASA) guideline components, the overall national guidelines, and the stroke alert policy at DHMC.
- Door to stroke team ≤15 minutes
- Door to CT ≤25 minutes
- Stroke team ≥45 minutes
- Blood glucose ≤150 mg/dl or ≤400 mg/dl
- Identify factors associated with non-compliance with: a) individual guideline components, b) overall current national guidelines, and c) the stroke alert policy at DHMC. Working hypothesis: non-compliance differs by Location, Primary specialty service, Time of day.
- Explore factors that affect stroke alert accuracy at DHMC. Working hypothesis: stroke alert accuracy differs by Location, Primary specialty service, Time of day.

Results

- 2015 STROKE ALERTS AT DHMC
- Overall, DHMC had 19.6 stroke alerts per month on average in 2016.
- Inpatient alerts averaged 8.9 per month or 45% of the alerts.
- Primary service is significantly associated with accuracy of true stroke
- Location of critical care yields statistically significant increased accuracy of true stroke
- “On-hour” (7a-7p) inpatient stroke alerts are statistically significant for rapid use of “door-to-CT order” and decreased accuracy

Overall adherence with timing guidelines

Evaluation

- 78 total stroke alerts from Jan 1, 2016-October 31, 2016 (76 charts reviewed)
  - Mean age 71 years
  - 30 true strokes (~40%)
  - 67% of true strokes were in females (n=25)
  - 90% of inpatient stroke were already on antplatelet Rx
  - 17% of inpatient stroke had NIHSS ≥25 (statistically significant – more accurate stroke alert)
  - Stroke team response time in compliance with guidelines (82%)
  - “Alert to CT initiation” ≤30 min in compliance with guidelines (37%)
  - Pre-transport vs post-transport involvement not significant for decreasing “time to CT initiation”
  - Although location of critical care had increased accuracy, they were least likely to meet all individual guidelines compared to other (p<0.07)
- No in-hospital “stroke-alert” patient received IV/IA or interventional thrombectomy

Overall outcomes were not associated with missing/not meeting national guidelines or stroke accuracy

Implications

- Patterns of care and gaps in practice were identified, leading to recommendations for future improvement of inpatient stroke alerts both institutionally and nationally.
- Future Steps:
  - Develop an educational program to assist the various units and specialty services with “stroke-alert” best practice
  - Identify process improvement steps to improve adherence to national guidelines and improve patient outcomes
  - Identify additional criteria to increase accuracy of inpatient stroke alerts