National Trends in Utilization and Outcomes of Mechanical Thrombectomy in Acute Ischemic Stroke

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Introduction

- In early 2015, five pivotal trials (MR CLEAN, ESCAPE, EXTEND IA, SWIFT PRIME and REVASCAT) showed compelling evidence that mechanical thrombectomy improves outcomes in acute ischemic stroke (AIS).
- It was expected that more patients would undergo endovascular treatment for stroke leading to improved outcomes nationally.
- We performed analysis to evaluate trends in utilization and outcomes of endovascular treatment among stroke patients over a four-year period.

Methods

- Using the Healthcare Cost and Utilization Project (HCUP) Nationwide Inpatient Sample (NIS), we isolated patients with primary diagnosis of AIS in the US from 2012 – 2015.
- Diagnoses and procedures were identified based on ICD 9 codes.
- The population was dichotomized into 2012-2014 (pre-trials) and 2015 (post-trials).
- The endovascular treatment rate for AIS was evaluated by t-test, while hospital length of stay (LOS), time of procedure since admission (admission is day zero), and clinical outcomes (occurrence of intracranial hemorrhage (ICH), discharge disposition and in hospital mortality) by multivariate logistic/linear regression analysis.

Results

- Total 351,967 patients admitted from 4,874 hospitals with AIS.
- 5,003 (1.42%) underwent endovascular treatment.
- The endovascular treatment rate doubled from 2012 (1.09%) to 2015 (2.16%).
- After adjusting for demographics and comorbidities, there was:
  - A significant decrease in LOS: Coef. -0.67, p=0.002, 95%CI [-1.24; -0.10].
  - A significant decrease of the time of procedure since admission: Coef. -0.31, p=0.0001, 95%CI [-0.38; -0.25].
  - No significant difference of secondary ICH (p=0.311).
  - A significant increase of home discharge rate: OR 1.33, p=0.001, 95%CI [1.13; 1.57].
  - No significant difference of nursing facility transfer rate (p=0.123).
  - No significant difference of in-hospital death rate: OR=0.88, p=0.134, 95%CI [0.74; 1.04].

Conclusions

Over the four years, endovascular treatment utilization has been significantly increased in AIS patients with improvement in patient morbidity but not mortality.

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References