

Patterns and Outcomes of Care in the Emergency Treatment and Hospitalization of Ischemic Stroke

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BACKGROUND

Currently, less than 10% of patients who suffer an ischemic stroke actually reach the hospital in time to receive thrombolytic therapy. Recently published guidelines suggest that the risks of heparin therapy due to intracranial bleeds outweigh the benefits in the treatment of ischemic stroke. The purpose of this study was to (1) evaluate patterns in the emergency room (ER), and to (2) profile therapeutic agents used to treat patients in light of current guidelines.

METHODS

1999 National Hospital Ambulatory Medical Care Survey (NHAMCS) data were used to evaluate emergency room admissions for all patients with ICD-9 code 436 - acute cerebrovascular disease. Standard weights were used to estimate national averages. Descriptive statistics were generated for the overall ischemic stroke population and by major therapeutic agents.

Fiscal Year 2001 Medicare Provider Analysis and Review (MEDPAR) data were used to evaluate patterns of care and charges associated with the inpatient hospital stay. Medicare patients with DRG code 014 - Specific Cerebrovascular Disorder except TIA were selected. A total of 342,503 beneficiary claims records were identified. Descriptive statistics, hospital charges, and duration of stay in hospital were determined. No adjustments were made to account for comorbidities

RESULTS

Emergency room care

An estimated 597,045 patients presented to the ER with the diagnosis of ischemic stroke. The patient population was 48.8% female, with the majority of the patients aged 65 or older (70.7%). Race composition was 77.8% white and 20.2% black (Table 1). A little more than half the patients (51.9%) were insured by Medicare. Approximately 34.7% of patients were triaged within 15 minutes, but almost 10% of the patients waited for more than an hour to be triaged (Figure 1). The average number of diagnostic services was 6 per patient, with 62.4% of patients receiving a CAT scan, and less than 3.0% receiving an MRI. The most commonly reported medications were: blood glucose regulators (11.1%), anticoagulants/thrombolytics (9.8%), non-narcotic analgesics (6.2%), antiasthmatics/bronchodilators (6.0%), acid/peptic regulators (5.8%), antiemetics (5.4%), and beta blockers (4.9%) (Figure 2). The vast majority of patients (90.2%) did not receive an anticoagulant or thrombolytic in the ER. Approximately 81% of the patients from the ER were admitted to inpatient hospital stay.

Inpatient care

An estimated 342,503 Medicare recipients were admitted to the hospital for specific cerebrovascular disorder except TIA. The patient population was 59.4% female, with the majority of the patients age 65 or older (72.3%). Race composition was 83.7% white and 13.8% black (Table 2). During the inpatient stay, 11% were admitted to the intensive care unit. The mean length of stay in the hospital was 6.7 days with the majority of time spent in semi-private rooms (Table 2). The mean total charge for an inpatient admission was \$15,563. The top five charges were room and board, radiology, pharmacy, laboratory, and intensive care with room and board being the most significant cost driver (Figure 3). Mortality rate was 10.6%. Upon discharge from the hospital approximately 25% of patients went to a skilled nursing facility (SNF) (Figure 4). Patients who died and who were discharged to a SNF incurred the highest hospital charges (Figure 5,6).

Table 1: ER Patient Demographic

	NHAMCS 1999 (estimated percent of ER patients)	
	%	
Age	Less than 25	0.3
	25 – 64	29.0
	65 and over	70.7
Gender	Male	51.2
	Female	48.8
Race	White	77.8
	Black	20.2
	Other, unknown	2.0

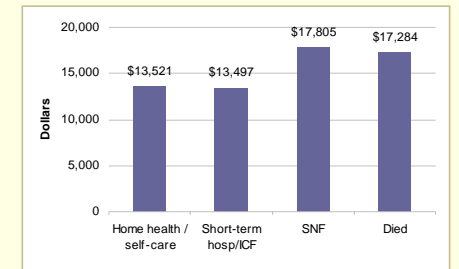
Note: N=597,045 Data based on diagnosis code ICD-9 436 for Ischemic Stroke

Table 2: Medicare Patient Demographics for hospital stay

	MEDPAR 2001 (Medicare Patients)	
	%	
Gender	Male	40.6
	Female	59.4
Race	White	83.7
	Black	13.8
	Other, unk	2.5
Mean Length of Stay	days	6.7
	ICU/CCU	1.3
	Private/Semi-private room	5.3

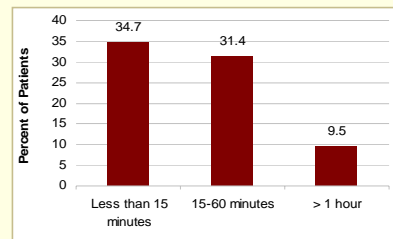
Note: N=342,503 Data based on DRG 014 for Specific Cerebrovascular Disorder except TIA

Figure 5: Mean Total Charges of Medicare Stroke Patients by Discharge Destination (MEDPAR 2001)



Note: All charges significantly different except for home health care and short-term hosp/ICF (p<0.001)

Figure 1: Triage Time for Hospital ER Stroke Patients (NHAMCS 1999)



Note: 24.5% of patients had an unspecified triage time; %s are greater than 100% due to rounding error

Figure 3: Top Five Mean Charges of Medicare Stroke Patients (MEDPAR 2001)

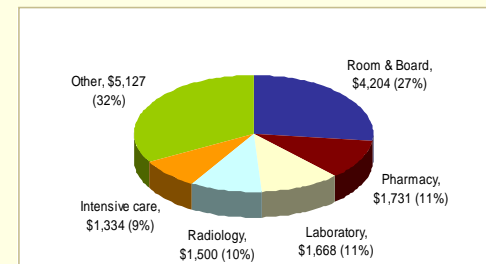


Figure 2: Most Commonly Reported Medications for Hospital ER Stroke Patients (NHAMCS 1999)

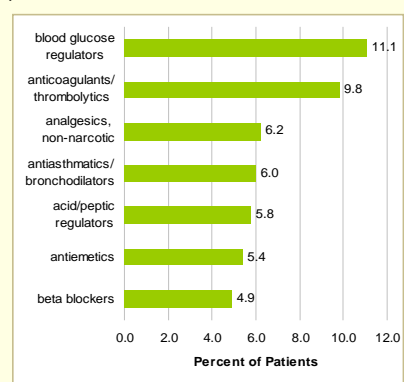
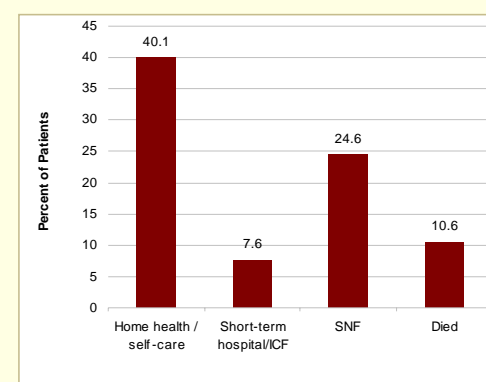


Figure 4: Discharge Destinations of Medicare Stroke Patients (MEDPAR 2001)



DISCUSSION AND CONCLUSION

The vast majority of ischemic stroke patients do not receive thrombolytic or anticoagulant therapy in the ER and are subsequently admitted for inpatient stay in the hospital. The inpatient stay is associated with high charges, driven mainly by room and board. No adjustment for comorbidities was made in evaluating clinical or economic outcomes of care. Outcomes after inpatient stay are associated with significant morbidity, mortality, and increased resource utilization. Specifically, patients with the worst outcomes (death and admission to a skilled nursing facility) require the most expensive courses of care. Early therapeutic interventions in ischemic stroke may prevent or offset the downstream burden of illness.

SOURCES

- National Ambulatory Medical Survey: 1999; National Center for Health Statistics, Hyattsville, Maryland.
- Expanded Modified MEDPAR - Hospital (National) file, Release 5/2002, FY2001.