Representativeness of the Get With The Guidelines-Stroke Registry: Comparison of Patient and Hospital Characteristics Among Medicare Beneficiaries Hospitalized with Ischemic Stroke

Mathew J. Reeves, BVSc, PhD; Gregg C. Fonarow, MD; Eric E. Smith, MD, MPH; Wenqin Pan, PhD; DaiWai Olson, PhD; Adrian F. Hernandez, MD , MHS; Eric D. Peterson, MD, MPH; Lee H. Schwamm, MD

Disclosures

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- The individual author disclosures are listed in the manuscript

Background

- Clinical registries are focusing on large "real-world" patient populations and are therefore serving an increasing important role in measuring the delivery, effectiveness and efficiency of health care.
- However, the usefulness of any registry depends largely on the reliability of its data and the degree to which it accurately represents the underlying patient population targeted by the registry.

Introduction

- The Get With The Guidelines (GWTG) – Stroke Program
  - was developed by the American Heart Association/American Stroke Association
  - as a national stroke registry and is a large quality improvement program
  - Its generalizability is unclear

Introduction

- Because of its substantial size, and broad geographic scope, the GWTG-Stroke registry provides an important source of data concerning the characteristics, treatments, quality indicators, and in-hospital outcomes for acute stroke patients hospitalized throughout the U.S.
- However, because of the potential for selection bias both at the hospital and patient level, questions remain about its representativeness.

Objectives

- Medicare Claims were used to ascertain the representativeness of the ischemic stroke admissions in GWTG-Stroke by:
  1) comparing patient characteristics and in-hospital outcomes between Medicare beneficiaries who were linked to the GWTG-Stroke registry and those that remained unlinked, and
  2) comparing hospital characteristics between GWTG-Stroke and non-GWTG-Stroke hospitals.

Methods: Data Collected

- GWTG-Stroke Registry Data
  - All admissions aged >=65 years with a clinical diagnosis of ischemic stroke, entered into registry between April 2003 and December 2007.
- Medicare Fee-For-Service (FFS) Data
  - all FFS Medicare inpatient claims files for acute stroke and Transient Ischemic Stroke (TIA) for the period April 2003 to December 2007.
  - Excluded subjects in Medicare managed care (15-25% of CMS population).

Methods: Data Analysis

- GWTG-Stroke is an ongoing, voluntary, observational registry and a continuous performance improvement program for patients hospitalized with stroke or TIA.

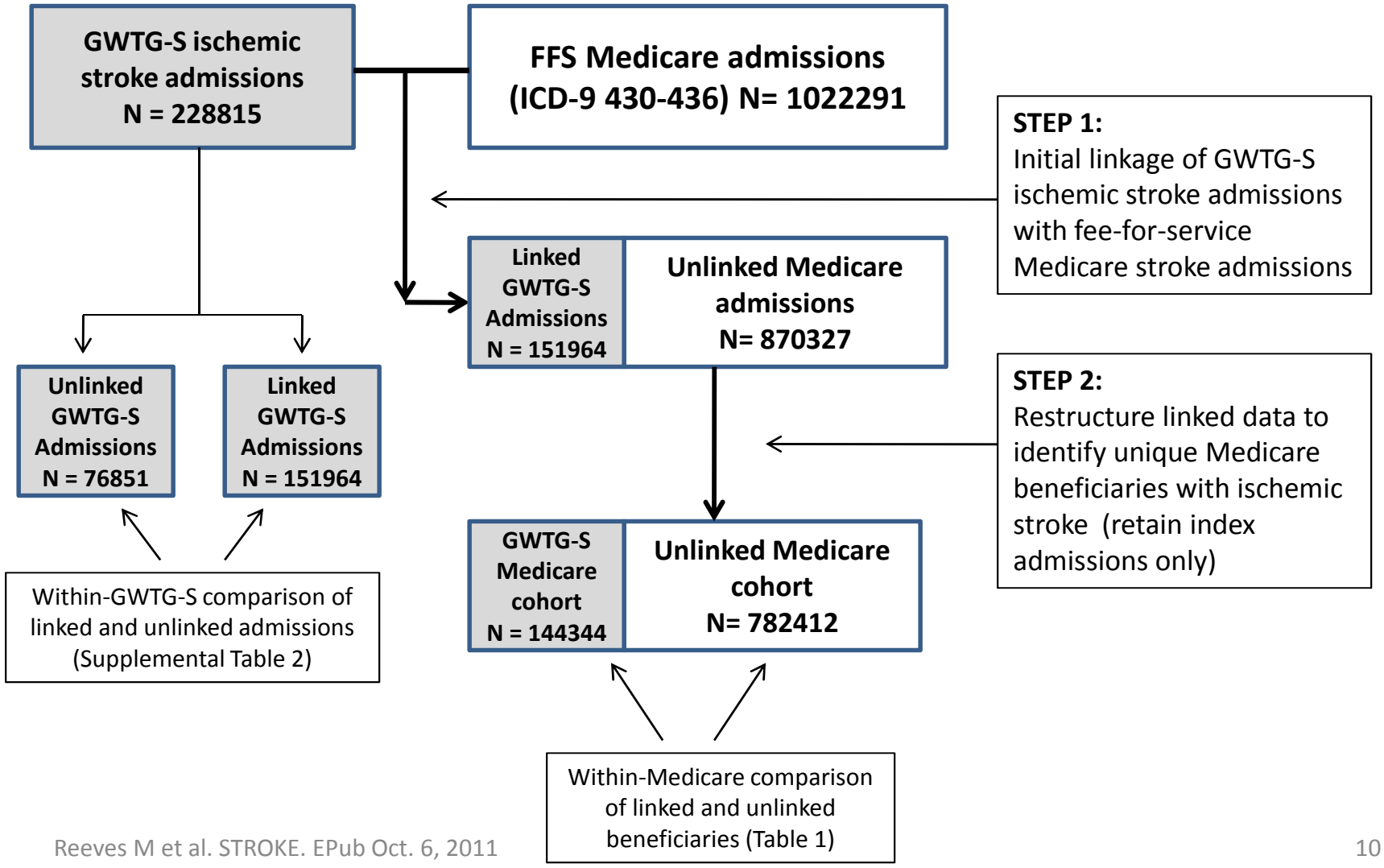
- A web-based Patient Management Tool provides decision support at the point-of-care, on-demand reporting and patient education features (Outcome, Cambridge, MA).

- Patient data abstracted by trained hospital personnel: Demographics, medical history, initial CT findings, in-hospital treatment and events, discharge treatments, treatment contraindications, counseling, in-hospital mortality, and discharge destination.

Methods: Data Linkage

- Individual GWTG admissions were matched to Medicare claims by
  - identifying unique combinations of hospital ID code, admission and discharge dates, date of birth, and sex.
- Approach takes advantage of the hospital clustering observed in each dataset to identify unique patient records.
- After the initial linkage was completed, data were then restructured to retain only the first index ischemic stroke admission for each unique Medicare beneficiary.
- The data linkage resulted in the following 2 groups :
  - **Linked GWTG-Stroke Medicare cohort**
  - **Remaining Unlinked Medicare cohort**

Derivation of study cohorts from data linkage of GWTG-Stroke Ischemic Stroke Admissions and FFS Medicare Stroke Admissions



Results

- GWTG-Stroke Data
  - 228,815 GWTG-Stroke admissions age 65 years or older with ischemic stroke enrolled at 1087 registry hospitals during the study period
  - 66% (n= 151964) were successfully linked to the Medicare FFS claims (n= 76851 remained unlinked).

- Medicare FFS Data
  - 926,756 unique FFS Medicare beneficiaries with acute ischemic stroke from 4234 hospitals. 144,344 (15.6%) were successfully linked to the GWTG-Stroke registry, leaving 782,412 unlinked Medicare beneficiaries.
  - 1022 of 4234 hospitals (24.1%) had linked patients indicating that they had participated in the GWTG-Stroke program.
  - These 1022 hospitals represented 94% of the 1087 hospitals in the GWTG-Stroke registry during this time period.

Results

- Patient Characteristics were compared between:
  - the linked GWTG-Stroke Medicare Cohort and
  - the unlinked Medicare Cohort
- Overall there were only relatively minor absolute differences between the linked and unlinked cohorts.
- Mean age was almost identical:
  - 79.4 linked cohort and 79.7 in unlinked cohort
- Linked GWTG-Stroke patients were slightly more likely to be male, white and less likely to be black.
- There were a few differences in comorbid conditions between the 2 groups:
  - GWTG-Stroke beneficiaries were more likely to have a history of carotid stenosis, prior stroke and renal disease.

Comparison of Patient Characteristics: Linked GWTG-Stroke Medicare Cohort and Unlined Medicare Cohort

Variable	Linked GWTG-Stroke Medicare Cohort (n=144344) Percent	Unlinked Medicare Cohort (n=782412) Percent	Absolute Percent Difference
Demographics			
Age, Years, Mean	79.4	79.7	0.3
Male	42.1	39.9	2.2
Female	57.9	60.1	
White	86.0	83.1	2.9
Black	10.2	12.3	2.1
Comorbidity (top differences)			
Carotid stenosis	16.3	8.3	8.0
Renal	12.8	9.8	3.0
Stroke	10.9	8.7	2.2
AMI	11.6	10.1	1.5
Hypertension	78.9	77.9	1.0

Results

- Comparison of hospital characteristics between
  - the 1022 GWTG-Stroke hospitals and
  - the 3212 non-GWTG-Stroke hospitals.
- There were large geographical differences in the location of the 2 groups of hospitals;
  - Substantially more GWTG-Stroke hospitals were from the Northeast and South and fewer from the Midwest.
- GWTG-Stroke hospitals were much more likely to be larger, teaching hospitals from urban areas with higher annual ischemic stroke volumes
  - Median 102 for GWTG-Stroke hospitals vs. 26 for Non-GWTG-Stroke hospitals.

Comparison of GWTG-Stroke and Non-GWTG-Stroke Hospitals

Variable	GWTG Hospitals (n=1022) Percent or No.	Non-GWTG Hospitals (n=3212) Percent or No.	Absolute Difference Percent or No.
Northeast Region	31.8	20.3	11.5
South Region	37.4	29.6	7.8
Midwest Region	13.3	31.0	17.7
West Region	17.5	19.1	1.6
Rural Hospital, “No”	97.3	72.0	25.3
Teaching Hospital, “Yes”	17.3	3.4	14.3
No. of Beds (Mean) / (Median)	332.5 / 281.0	132.1 / 88.0	200.4 / 193
No. of Ischemic Stroke Discharges (Mean) / (Median)	119.1 / 102.0	42.9 / 26.0	76.2 / 76

Results

- Data Comparison for the linked GWTG-Stroke Medicare and unlinked Medicare cohorts on
  - length of stay (LOS), discharge to home and in-hospital mortality
- LOS was identical between the 2 groups
- Proportion discharged home was similar
- In-Hospital mortality rate was slightly lower in the linked GWTG-Stroke cohort compared with the unlinked
  - This difference remained after adjustment for patient- and hospital-level variables

Comparison of Medicare Beneficiaries Hospitalized Acute Ischemic Stroke

Variable	Linked GWTG-Stroke Medicare Cohort (n=144344)	Unlinked Medicare Cohort (n=782412)	Absolute Difference Percent or No.
Clinical Outcome			
Mean LOS (SD) *	6.5 (4.9)	6.5 (5.1)	0.0
Discharge Home	37.9%	38.0%	0.1
In-hospital Mortality ^	6.3%	7.0%	0.7

* Calculation of LOS was based on 876629 patients because patients transferred in or transferred out were excluded (n=50127)
^ Calculation of in-hospital mortality was based on 894601 patients because patients transferred out were excluded (n=32155)

Comparison on linked and unlinked GWTG-Stroke Admissions

- Compared 151964 (66.4%) linked to 76851 (33.6%) unlinked.
- Linked admissions were:
  - slightly older (median 80 years vs. 78 years)
  - more likely to be white (82% vs. 74%) and less likely to be black, Asian or Hispanic.
  - minimal differences in past medical history and LOS.
  - slightly less likely to be discharged home (37% versus 40%)
  - slightly lower in-hospital mortality (6.6% versus 7.5%)

Limitations

- Data is limited to Medicare-aged patients
  - approx 30% of strokes occur in < 65 year olds
- 1/3rd of GWTG admissions remained unlinked
- No information on stroke severity

Conclusions

- Despite substantial differences between GWTG-Stroke and non-GWTG-Stroke hospitals, Medicare beneficiaries entered in the GWTG-Stroke program were similar to other Medicare beneficiaries.

- These data suggest that the Medicare-aged GWTG-Stroke ischemic stroke admissions are generally representative of the national fee-for-service Medicare ischemic stroke population.