

Interventional Stroke Therapies in the Elderly: Are We Helping?

Neer Zeevi¹, Nora S Lee², Ilene Staff², Louise D McCullough².

1. UConn Center on Aging, UCHC, Farmington, CT; 2. Stroke Center at Hartford Hospital, Hartford CT

Background

- Age is the strongest independent risk factor for acute ischemic stroke (AIS)
- Number of elderly AIS patients is increasing
- Elderly AIS patients have increased morbidity and mortality
- Prior studies of AIS in elderly have found intravenous tissue plasminogen activator (tPA) to be safe and effective
- Endovascular stroke interventions extend the therapeutic window, improve recanalization rates and stroke outcomes
- Unclear whether endovascular therapies are being offered and provide benefit in this age group
- Assessed safety and efficacy of endovascular interventions in AIS patients ≥ 75

Methods

- Retrospective review of the Stroke Center at Hartford Hospital (SCHH) database from October 2005 to September 2009
- SCHH is certified by the Joint Commission of Accreditation of Healthcare Organizations (JCAHO) as a Primary Stroke Center and serves as a tertiary referral center
- Compared AIS patients aged ≥ 75 years to counterparts aged <75 years admitted to the SCHH
- Parameters:
 - Rate of endovascular treatment
 - Stroke severity using NIH Stroke Scale (NIHSS)
 - In-hospital outcomes
 - Long-term outcomes using Modified Barthel Index (mBI)
 - Comparisons using Mann-Whitney and chi square test

Demographics

	Age <75	Age ≥ 75
Patients	1190 (53%)	1064 (47%)
Mean Age	59 \pm 11	84 \pm 6
Gender		
Males	684 (58%)	410 (39%)
Females	506 (42%)*	654 (61%)*
LDL:	96 \pm 42*	86 \pm 37*
Coumadin use	113 (9.5%)*	191 (18%)*
Statin use	453 (38%)	442 (41%)
Diabetes	383 (32%)*	294 (28%)*
Hypertension	848 (71%)*	902 (85%)*
Heart Disease	410 (34%)*	483 (45%)*
Atrial Fibrillation	171 (14%)*	452 (42%)*
Pre-stroke Barthel	19.5 \pm 1.7*	17.8 \pm 3.7*

Figures in parentheses are percentages, * p < 0.05; χ^2 test.

Rates of endovascular treatment

	Age <75	Age ≥ 75
Total	78/1190 (6.6%)*	41/1064 (3.9%)*
Male	45/684 (6.6%)	16/410 (3.9%)
Female	33/506 (6.5%)	25/654 (3.8%)
IA only	26 (33%)	12 (29%)
IV and IA	20 (26%)	12 (29%)
IA and device	11 (14%)	5 (12%)
Device only	21 (27%)	12 (29%)
Time to intervention	155 \pm 118	153 \pm 87

Figures in parentheses are percentages, * p < 0.05; χ^2 test.

Adverse Outcomes

	Symptomatic ICH	In-hospital mortality
Age <75	7/78 (9%)	18/78 (23%)
Age ≥ 75	9/41 (22%)*	17/41 (42%)*

Figures in parentheses are percentages, p < 0.05; χ^2 test.

Short- and long-term outcomes

	Age <75 (n=78)	Age ≥ 75 (n=41)
Admission NIHSS	15.0 \pm 7.6	16.3 \pm 7.5
Discharge NIHSS	6.3 \pm 6.6	6.7 \pm 6.3
Change in NIHSS	7.2 \pm 7.8	7.2 \pm 6.5
Barthel at 3 months	15.7 \pm 6.0	15.3 \pm 5.9
Barthel at 1 year	18.2 \pm 3.4*	15.5 \pm 5.5*

Figures in parentheses are percentages, * p < 0.05; χ^2 test

Conclusions

- Older patients are less likely to receive endovascular treatment which may reflect treatment guidelines, care provider preferences, pre-admission functional status and social factors (advanced directives, marital status)
- Dichotomous response in patients ≥ 75 years. High mortality (42%) but favorable short and long-term outcomes as measured by NIHSS and mBI in those elderly patients that survive
- Increased mortality in patients ≥ 75 years may be due to increased rates of symptomatic ICH, increased stroke severity, lower pre-stroke functional status and increased medical comorbidities
- Increased ICH rates in patients ≥ 75 years may be due to higher rates of cardioembolic strokes from atrial fibrillation or to increased coumadin use
- Age-related changes in rTPA clearance, coagulation, blood-brain barrier function and amyloid angiopathy could also potentially predispose to ICH.
- Prospective randomized trials are needed to determine criteria for selecting elderly stroke patients most likely to benefit from acute endovascular stroke therapies



THE STROKE
CENTER

HARTFORD HOSPITAL