Risk stratification: let’s not forget the aging brain

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November 17, 2015

No relevant financial relationships exist.

Grant Sponsorship:
NIH – US Public Health Service, NINDS – U01 NS080168

Age clinical science is full of surprises

B
Stroke and Age

C
MI and Age

Stroke Endpoint

P interaction = 0.033

David F. Kallmes, MD
### Neuropathological Profile of Mild Cognitive Impairment From a Population Perspective

*Alzheimer Dis Assoc Disord 2012;26:205–212*

- 13,004 age 65 and older randomly selected in 5 areas of the UK
- 355 brains
- 40% of the brains were classified normal or with plaques or tangles of insufficient severity for AD

#### Neurology

**Extent and distribution of white matter hyperintensities in normal aging, MCI, and AD**

M. Yoshita, MD; E. Fletcher, PhD; D. Harvey, PhD; M. Ortega, BS; O. Martinez, BS; D.M. Mungas, PhD; B.R. Reed, PhD; and C.S. DeCarli, MD

Neurology 2006;67:2192–2198

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### Clinical and Imaging Features Associated with an Increased Risk of Late Stroke in Patients with Asymptomatic Carotid Disease

*Eur J Vasc Endovasc Surg (2014) 48, 633e640*

- The Asymptomatic Carotid Stenosis and Risk of Stroke Study (ACRS) showed annual risk of stroke of 3.6% with those with silent stroke vs. 1% without, p=0.002.
- The Asymptomatic Carotid Surgery Trial (ACST) showed that among 1331 those with either ipsilateral infarction or a history of cerebral symptoms had 5.8% absolute risk of stroke compared to those with no symptoms or infarction (abstract).

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### Cerebrovascular reactivity predicts stroke in high-grade carotid artery disease

*Neurology 2014;83:1424–1431*

- Review of 9 studies and 754 patients with carotid stenosis or occlusion
- TCD Doppler with CO2 reactivity testing and then followed for stroke
Preoperative frailty Risk Analysis Index to stratify patients undergoing carotid endarterectomy

Alyson A. Melin, DO, Kendra K. Schmid, PhD, Thomas G. Lynch, MD, Iraklis I. Pipinos, MD, Steven Kappes, MD, G. Matthew Longo, MD, Prateek K. Gupta, MD, and Jason M. Johanning, MD.


CREST-H Question:
Can revascularization (CEA or CAS) improve cognitive impairment among a subset of CREST-2 patients with cerebral hemodynamic impairment?

CREST-H Study design
- All CREST-2 patients get cognitive assessments at baseline, and yearly up to 4 years
- Image 500 CREST-2 randomized patients using MRI gado-perfusion scan.
- 100 hemodynamically impaired (TTP delay >2 seconds); 400 hemodynamically normal
- Compare cognitive scores at 1 year among those hemodynamically impaired at baseline who were assigned to revascularization vs. medical only.
  - Hypothesis 1: Among patients randomized in CREST-2 who have impaired perfusion at baseline as measured by PWI time to peak (TTP) delay, there will be a difference in the change in cognitive performance between baseline and 1-year between those assigned to revascularization by CEA or CAS plus OMT versus those assigned to OMT alone, adjusting for age, baseline cognitive performance, depression, prior cerebral infarcts, subsequent silent infarction, WMH volume, and microbleeds.
CREST-H Study Diagram

Baseline

1-year

Years 2-6

Thanks for your attention.