Post Stroke Cognitive Decline

Deborah A. Levine, MD, MPH
Departments of Medicine & Neurology
University of Michigan
deblevin@umich.edu

Presenter Disclosure Information
Deborah A. Levine, MD, MPH
Post Stroke Cognitive Decline
FINANCIAL DISCLOSURE:
Grants/Research Support: NIH/NIA R01
Consultant / Advisory Board: Astra Zeneca and UCSF
(SOCRATES trial event adjudicator), UCSF (POINT trial event adjudicator), Member, Program Advisory Committee of the Kaiser Permanente Northern California - University of California San Francisco Stroke Prevention/Intervention Research Program.

UNLABELED/UNAPPROVED USES DISCLOSURE:
Use of citocholine in patients with stroke is investigational only

Teaching Points
1. Incident stroke is associated with an acute decline in cognitive function and also accelerated and persistent cognitive decline over years.
2. Any cognitive domain can be affected.
3. Preventing recurrent strokes may reduce risk of poststroke cognitive decline.
Outline

• Epidemiology
• Clinical presentation
• Pathogenesis
• Management

Stroke mortality is declining.

Age-adjusted death rates for diseases by year: United States, 1900 to 2010.

Leibson DT et al. Stroke. 2014;45:315-353. Copyright © American Heart Association, Inc. All rights reserved.
Poststroke dementia is increasing.

- Up to 30% of stroke survivors have poststroke dementia.
  - 10% have dementia before stroke.
  - 10% have dementia after first stroke.
  - 33% have dementia after recurrent stroke.

- Prevalence of poststroke cognitive decline (both dementia and cognitive impairment) is increasing in older adults.
  

Stroke disability is increasing.

- Stroke disability is increasing.
  - Over the last twenty years, disability rates—years lived with disability—for stroke rose 40%, the only major disease showing a significant increase.

- Cognitive decline is a major cause of disability in stroke survivors.
  
  

Cognitive decline has risks.

Poststroke cognitive decline is associated with:

- Mortality
- Disability
- Institutionalization
- Recurrent stroke
- Poorer quality of life

What are risk factors for PSCD?

- Older age
- Low education level
- Atrial fibrillation
- Prestroke cognitive decline
- Diabetes?
- Hypertension?
- Left hemisphere stroke
- Stroke severity
- Recurrent stroke
- Cerebral atrophy on brain imaging


Outline

- Epidemiology
- Clinical presentation
- Pathogenesis
- Management
Cognitive effects of stroke are variable.

All cognition domains can be affected:
- Executive function/processing speed
- Learning and Memory (working and verbal)
- Language
- Visuospatial function
- General mental status


Does cognitive decline after stroke persist for years?

Predicted Mean Change in Cognitive Function Test Scores Before and After Acute Stroke at Year 3: REGARDS Study, 2003-2013

Does cognitive decline after stroke persist for years?

- Incident stroke is associated with an acute decline in cognitive function and also accelerated and persistent cognitive decline over 6 years.

Diagnosis requires testing.

- Clinical practice guidelines and quality improvement programs recommend cognitive assessments for stroke patients before hospital discharge and also in postacute settings.

- Our work suggests stroke survivors warrant monitoring for mounting cognitive impairment years after the event.
Cognitive tests are recommended.

- Montreal Cognitive Assessment (MoCA)
- Addenbrooke’s Cognitive Examination-Revised
- Neuropsychological battery
- Mini-Mental State Examination (MMSE) – Highly correlated with MoCA ($r=0.8$) but has ceiling effect and less detects visuoexecutive dysfunction.

Outline

- Epidemiology
- Clinical presentation
- Pathogenesis
- Management

Shared mechanisms may contribute to poststroke cognitive decline.
Most dementia is mixed.

• There are contributions by neurodegenerative disease, cerebrovascular disease, and comorbidity.

• Microinfarcts, microbleeds, and atrophy play key role.


Outline

• Epidemiology

• Clinical presentation

• Pathogenesis

• Management

Evidence-based treatment is lacking.

• Currently, no drug has proven effective in treatment of poststroke cognitive decline.

• Cognitive rehabilitation may help.

• Preventing recurrent strokes likely is effective.
Cognitive rehabilitation may help.

- Cognitive training and rehabilitation represent possible therapies for PSCD.
- Cochrane reviews have found unclear effectiveness of cognitive rehabilitation and occupational therapy and insufficient evidence to evaluate individualized treatment.


Computer training is promising.

- Computer-assisted cognitive training may improve cognitive scores perhaps by increasing functional connectivity of the hippocampus with the frontal lobe.
- Larger trials with longer follow-up are needed.


Hypertension treatment is associated with lower risk of cognitive decline related to recurrent stroke.

PROGRESS trial

Secondary prevention is associated with lower risk of cognitive impairment in patients with ischemic stroke without atrial fibrillation. South London Stroke Register

Some studies are negative.
• The SPS3 trial (n=2916) found that short-term dual antiplatelet treatment or blood pressure reduction in patients with recent lacunar stroke was not associated with lower risks of cognitive decline.

Clinical trials have been negative.
• The ASPIS trial (n=202) found no benefit of a 24-month multi-domain intervention focused on improving lifestyle and vascular risk factors on the incidence of poststroke cognitive decline compared with standard stroke care.
• Studies with a larger sample size are needed.
Other interventions may help.

• Diagnosis and treatment of depression.

• Reduction of polypharmacy.

• Aerobic exercise, mental activity, and social engagement.


The future is bright.

• Many trials are ongoing.

• Some results are intriguing.
  – Citicoline: Although the drug seems to be safe and well tolerated, more study of its disease-modifying effects and mechanisms are needed.


Outline

• Epidemiology

• Clinical presentation

• Pathogenesis

• Management
Teaching Points

1. Incident stroke is associated with an acute decline in cognitive function and also accelerated and persistent cognitive decline over years.
2. Any cognitive domain can be affected.
3. Preventing recurrent strokes may reduce risk of poststroke cognitive decline.

Deborah A. Levine, MD, MPH
deblevin@umich.edu