

Hiding in Plain Sight – Post Stroke Cognitive Assessment

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Cognitive decline after an acquired brain injury such as stroke is intuitively understood by both physicians and patients alike. Post Stroke Vascular Cognitive Impairment is an umbrella term for any one, or combination, of delirium, exacerbation of pre-existing dementia, transition of Mild Cognitive Impairment/Vascular Cognitive (MCI/VCI) Impairment to dementia, precipitation of new-onset dementia or VCI, and stable or improving cognitive deficit analogous to traumatic brain injury. Although the Irish National Stroke Audit recommends that 'all patients at risk should be screened periodically using a simple, standardised screen'¹, there are practical challenges in assessment due to the often complex linguistic, perceptual and praxis changes of stroke which means that assessment is neither simple nor standardised. Post-stroke cognitive impairment is an under-recognised and managed condition that results in significant functional impairment for many patients. We explore barriers to diagnosis and suggestions for approach in clinical practice.

Estimate of the impact of stroke diseases on cognition vary considerably: at the higher estimates, up to two-thirds of patients have been reported to have some post-stroke cognitive decline with up to one third progressing to develop dementia². A major systematic review suggested that 10% have a pre-existing dementia syndrome prior to an acute stroke, an additional 10% develop new dementia shortly after a first-overt stroke while more than one-third of patients may experience dementia following a recurrent stroke³. As there are approximately 10,000 strokes annually in Ireland and an estimated 30,000 people living in the community with post-stroke disability¹, it is clear that post-stroke cognitive decline is an issue of considerable importance

Clinical practice is often focused on the physical manifestations of stroke rather than the neuropsychological, with an emphasis on return to tasks related to self-care and independence rather than higher order cognitive function. Stroke patients share many of the risk characteristics for cognitive decline and all forms of dementia such as older age, smoking, hypertension, atrial fibrillation, and diabetes. Furthermore, many new presentations with memory impairment show evidence of previous infarction on brain imaging which may not have previously been formally diagnosed as stroke disease due to a lack of consensus on how to approach 'silent' stroke.

In the presence of communication and sensory disabilities, clinicians may need to consider a wider range of methods for assessing cognitive status, such as appropriateness of recognition of staff and family, preservation of diurnal rhythms, adequacy of engagement with care routines and rehabilitation, safety awareness, and carry-over of rehabilitation inputs over the course of time⁴. Non-verbal tests may also be helpful, with Raven's Matrices more helpful than standard cognitive screens, and tools such as 4-AT of more utility as they contain both observation and informant history.

Assessment is also made more difficult by confounding factors, particularly in the early phase of injury, such as increased risk of delirium (25% incidence in the acute post-stroke phase⁵) and depression. Incidence of depression post-stroke is as high as 33%⁶. Identifying change from cognitive baseline is complicated by the unfamiliar hospital environment and interaction with healthcare professionals who had not previously been in contact with these patients. Although 80% of extended cognitive assessments in Ireland are carried out by occupational therapists and 15% by psychologists, staffing deficits of occupational therapists in stroke units and a dearth of clinical psychologist posts may contribute to the paucity of in-depth cognitive assessment³.

Identification of functional impairment, key in dementia diagnosis, is not straightforward in the acute phase of stroke and assessment is ideally carried out later in the clinical course, with the differentiation as to what the cause of the deficit is cognitive or physical, a relatively sophisticated clinical judgement. On a practical level, the organization of assessment differs between institutions. Stroke outpatient and community services should provide adequate time and resources for appropriate cognitive assessment; it is a cause of some concern that coordinated community stroke services recommended in the Irish National Stroke Audit have not yet been implemented.

A study of 122 stroke survivors (median age 52) in Ireland published in 2016 found that 82% had been working before their stroke but only 32% were in full-time employment one-year post-stroke⁷. Mental fatigue (84%) and difficulties thinking (78%) were two of the three most common reasons reported causing difficulty at work. Although a younger cohort than the average of stroke patients, this study suggests a higher prevalence of cognitive dysfunction which may not be detected in standard cognitive impairment screening: earlier identification may aid in counselling of patients. Amongst a more age-representative sample of stroke patients, post-stroke cognitive impairment at 3 months is associated with increased institutionalization and a twofold increased risk of death at 3 years⁸.

For those diagnosed with post-stroke dementia, prognosis is more nuanced as some patients may stabilise after the initial insult: up to 20% will show recovery from a post-stroke cognitive decline. Others may undergo progressive cognitive decline related to worsening underlying vascular disease or a pre-existing dementia unmasked by the stroke-related deficit. In that context, standard dementia treatment such as acetylcholinesterase inhibitors should be trialled to assess benefit. Psychological interventions for cognition post-stroke may be of benefit, with a recent systematic review showing a small but significant effect on cognition, particularly attention and memory but not on executive dysfunction⁹.

The most effective strategy in preventing post-stroke cognitive impairment lies in the primary prevention of stroke disease. Management of vascular factors such as hypertension, hypercholesterolemia, diabetes, and smoking, as well as vigilance regarding detection of atrial fibrillation is effective not only in preventing acute strokes with hospitalisation but may also prevent the development of vascular cognitive decline¹⁰.

Although pharmacological intervention for post-stroke cognitive change is limited, significant benefit can be gained from post-diagnostic counselling and appropriate psychosocial support strategies from the fields of delirium and dementia care. Stroke services must engage in educating staff, patients and the public on post-stroke cognitive decline and limit progression through standardization of assessment, optimisation of vascular risk factors, treatment of delirium and dementia, and effective support.

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References:

1. Irish Heart Foundation: Council for Stroke. National Clinical Guidelines and Recommendations for the Care of People with Stroke and Transient Ischaemic Attack Revised Version March 2010
2. Teasell R, Salter K, Faltynek P, Cotoi A, Eskes G. Post-Stroke Cognitive Disorders. Canadian study of health and ageing, EBRSR 2000.
3. Pendlebury ST and Rothwell P. Prevalence, incidence, and factors associated with pre-stroke and post-stroke dementia: a systematic review and meta-analysis. *Lancet Neurol.* 2009 Nov; 8(11):1006-18.
4. Horgan F, McGee H, Hickey A, Whitford DL, Murphy S, Royston M, Cowman S, Shelley E, Conroy RM, Wiley M, O'Neill D. From prevention to nursing home care: a comprehensive national audit of stroke care. *Cerebrovascular Diseases.* 2011;32(4):385-92.
5. Shi Q, Presutti R, Selchen D, Saposnik G. Delirium in acute stroke: a systematic review and meta-analysis. *Stroke.* 2012;43:645–649
6. Ayerbe L, Ayis S, Wolfe C, Rudd A. Natural history, predictors and outcomes of depression after stroke: systematic review and meta-analysis. *Br J Psychiatry.* 2013;202:14–21
7. Horgan F et al. Exploring the Factors Related to Return to Work after Stroke. Irish Heart Foundation, January 2016.
8. Patel M, Coshall C, Rudd A, Wolfe C. Cognitive impairment after stroke: clinical determinants and its associations with long-term stroke outcomes. *J Am Geriatr Soc.* 2002; 50:700–706
9. Merriman N, Sexton E, McCabe G, Walsh M, Rohde D, Gorman A, Jeffares I, Donnelly N, Pender N, Williams D, Horgan F, Doyle F, Wren M, Bennett E, Hickey A. Addressing cognitive impairment following stroke: systematic review and meta-analysis of non-randomised controlled studies of psychological interventions. *BMJ Open* 2019;9:e024429
10. Mellon L, Brewer L, Hall P, Horgan F, Williams D, Hickey A and on behalf of the ASPIRE-S study group. Cognitive impairment six months after ischaemic stroke: a profile from the ASPIRE-S study. *BMC Neurology* 2015; 15:31