ARE NEURO-PSYCHOLOGICAL TESTS THE BEST BIOMARKERS FOR PRECLINICAL DEMENTIA?

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Dementia is fundamentally a disorder of cognitive function; even in 'mild' dementia major aspects of cognitive function including memory and attention are so severely compromised that everyday tasks and social interactions are impacted. Assessment of cognitive function with neuropsychological/cognitive tasks is a core part of the diagnosis of dementia.

What constitutes preclinical dementia? This is largely unclear. Historically a number of conditions have been presumed to be early stages of cognitive decline associated with ageing, including benign senescent forgetfulness, age associated memory impairment, age-related cognitive decline and mild cognitive impairment. An important point for this presentation is that most of these conditions are defined on the basis of poor performance on neuropsychological tests.

Normal cognitive ageing is gradually becoming to be recognised to be anything but benign, or simply restricted to a minority of individuals or one or two aspects of cognitive function (Salthouse, 2010). Cognitive deterioration in healthy individuals starts in the twenties and declines in a linear fashion decade by decade; many aspects of attention, information processing and memory declining by two or more standard deviations by the sixth and seventh decades. If we accept that cognitive function declines in such a fashion in normal ageing, the question becomes at which stage and in which individuals do these declines constitute a pre-clinical syndrome for dementia?

A number of biomarkers for dementia has been identified by the ADNI initiative. Neuropsychological testing appears to perform poorly in predicting dementia in relation to several other biomarkers. It will be argued that this is more a limitation of the tests used and the general methodology than an indication that cognitive function does not decline steadily as the symptoms of dementia develop. Dementia does not occur overnight, except in cases of severe vascular dementia and delirium. The gradual onset will be identifiable by neuropsychological tests, providing they are sensitive and can be repeated without showing training effects.

If we accept that cognitive dysfunction must be a core symptom of preclinical dementia, and that neuropsychological tests can assess such dysfunction, this makes such testing a very effective biomarker, and would raise the question of whether there was any need to look further? If appropriate cognitive tests are regularly administered to individuals from the forties onwards, abnormal rates of decline can be sought, and when detected, investigated as potential evidence of pre-clinical dementia. This of course does not rule out a number of other essential assessments (biomarkers) which will be used to support the diagnosis of pre-clinical dementia or help to identify other explanations for the declines.

In conclusion, appropriately sensitive and robust cognitive testing is the ideal biomarker for the detection of preclinical dementia.