

Subjective Cognitive Impairment Research

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Editorial

As age increases so does the risk of developing decline in certain aspects of information processing, memory perhaps the best known of these. For some individuals, perceived change in memory is worrying enough to prompt self-referral to their general practitioner or memory services for neuropsychological assessment. For a proportion of people formal investigation culminates in a diagnosis of mild cognitive impairment (MCI). For others however no objective change in memory or cognitive function is detected. Perceived decline in memory in the absence of objective evidence is commonly described as subjective cognitive impairment (SCI) [1]. Like MCI, although SCI is associated with an increased risk of developing dementia it is etiologically heterogeneous with some causes, such as depression [2], potentially responsive to intervention. Unlike MCI however, individuals with SCI appear to be followed up clinically relatively rarely. This is a controversial area and debate continues regarding the very early diagnosis of dementia in the absence of cure. However, as SCI can have a potentially treatable cause and can per se, detrimentally affect quality of life, it can be argued that cases of SCI should be fully investigated.

Of relevance to such debate is the fact that although SCI is defined by the lack of objective changes in neuropsychological tests of high level functions such as memory, cognition, perception and executive function, it is possible that such an absence of significant changes is the result of the relative insensitivity of current neuropsychological tests and the fact that high level functional deficit may only emerge at the later stages of the disease process. Research in Alzheimer's disease (AD) and MCI, both of which can be preceded by SCI, reveals that they can be characterized by abnormality in a much wider range and level of information processing than that measured by neuropsychological tests. This is especially the case with respect to visual and visual-attention-related processing, with evidence of significant abnormality in the functional integrity of some early, low level or fundamental aspects of processing, upon which the integrity of higher-level processing, such as memory and cognition can depend. Such abnormality in AD and MCI include pre-attentive visual processing and automatic change detection (visual mismatch negativity, [3-5]), intra-individual variability in reaction time in response to visual stimuli [6,7], phasic alerting [8] and inhibition of return [9], visual search [10], see Tales et al. for reviews [3-11]. Of interest with respect to such research in MCI is that it tends to be only a proportion of individuals that reveal such abnormal processing; perhaps the result of the etiological heterogeneity of this condition. With further research and development it is possible that some of these research-based tests may be valuable adjuncts in the early identification of neurodegenerative change. Arguably however such information may be of greatest practical application in mapping the integrity an individual's information processing and how

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this relates to signs, symptoms, abnormalities in behavior and difficulty in environmental interpretation and interaction that may affect the quality and safety of their everyday life (e.g. in relation to falls, driving skills and speed of reaction to a changing environment).

It follows therefore that a similar pattern of abnormality in functions not measured by neuropsychological tests may also exist in some individuals with SCI (dependent again perhaps upon etiology) and which, as in MCI, may improve the early diagnosis of dementia or explain, at least in part, the underlying cause of some signs, symptoms and behavioral changes. Indeed there is already evidence that SCI can be characterized by objectively measured change in some fundamental aspects of information processing [see 11 for review, 12,13] not measured by clinical neuropsychological testing. Little research has however examined the effect of SCI upon vision and attention-related processing and thus such transformative investigation forms a major aim for our research group. This editorial serves as a brief introduction to some of the controversial issues surrounding SCI and I hope that it will spark lively debate, research collaboration and idea generation!

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