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MILD COGNITIVE IMPAIRMENT: AGING TO ALZHEIMER'S DISEASE
Edited by Ronald C. Petersen
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This is an interesting, thought-provoking, sometimes controversial and eminently readable book. Mild cognitive impairment (MCI) refers to the borderland between normal ageing and dementia. The term MCI has recent origins, having been introduced only in the last decade in recognition of the fact that the onset of dementia is insidious. There is a prodromal phase during which an individual functions at a lower level than normal, yet the changes in cognition are insufficient to warrant a classification of dementia. Herein lies a fundamental conceptual difference between MCI and descriptive labels that acquired prominence in earlier decades, such as 'benign senescent forgetfulness' and 'age-associated memory impairment'. These latter terms implied changes in memory, which were thought to be largely consistent with and the product of normal ageing. MCI, by contrast, is construed as abnormal ageing and commonly thought of as the prodrome to dementia, more specifically to Alzheimer's disease.

MCI raises a variety of conceptual issues. If MCI is cognitive impairment in excess of that expected in normal ageing, what is the yardstick for defining normal ageing? Within a lifetime, a variety of adverse events, lifestyle factors and age-related medical conditions might potentially influence cognitive function. Studies of 'normal' ageing that adopt a rigorous policy of excluding from the study sample people with any potential risk factor whatever (e.g. the presence of diabetes or a history of alcohol consumption) risk identifying a population of 'supernormals' whose performance is unrep-

resentative of the ageing population as a whole. The implication of an overly healthy 'normal' reference group is that a high proportion of aged individuals would fall into the MCI category: it would become the rule rather than the exception. On the other hand, if less stringent criteria are used, where should the boundaries be drawn? Is 'normal' ageing simply what is most common, even though there may be an underlying pathology? The book demonstrates clearly the need for understanding of normal ageing. The classification of MCI is inextricably linked with notions of what is normal. There is an excellent chapter devoted to normative neuropsychology, which includes an overview of current thinking on normal ageing.

The chapter is stimulating, too, for its snippets of information that challenge received wisdom. For example, a hallowed practice in neuropsychology is to compare a person's scores on a particular test (for example, a test of memory) with his general level of functioning (usually determined by a standard test of intelligence), and to infer acquired impairment on the basis of within-subject performance disparities. It is *relative* performance that is thought to be important in identifying acquired impairment rather than absolute test scores. However, this practice, when applied to the elderly population, rests on the assumption that 'normal ageing' involves a uniform change across all cognitive domains, so that the correlations between domains of cognitive function that are present in young adults are maintained in healthy elderly people. Studies of normal ageing carried out by the authors Smith and Ivnik and their colleagues suggest that this is not so. Cognitive abilities do not show a uniform pattern of change. Some skills are robust throughout life, whereas others decline. Some abilities are more prone to fluctuations in performance than others. These authors found that absolute memory function with respect to control norms was a more accurate predictor of clinical status than relative function with respect to the subject's own performance on other cognitive tests. Such findings undermine conventional clinical neuropsychological practice.

Just as the MCI classification is determined by concepts of normal ageing, so too is it dependent on concepts of dementia. In recent years there has been a gradual shift away from the traditional notion of dementia as a non-specific, uniform decline in all domains of cognitive function. It is recognized that patients with dementing illnesses such as Alzheimer's disease display cognitive strengths and weaknesses that reflect the regional distribution of pathological change within the brain, and sometimes deficits can be remarkably focal. Nevertheless, classification criteria for dementia that require the presence of progressive impairments in multiple domains of function persist. An individual with a relatively selective impairment of memory would not be regarded as fulfilling the diagnosis of dementia, and thus would fall into the category of MCI by default. A shift in the concept of dementia to include more restrictive cognitive disturbances would necessarily have an impact on the definition of MCI. The dementia classification might potentially subsume MCI, or at least shift the balance of what constitutes MCI. In his introductory chapter, the editor adopts a modest and pragmatic approach to MCI. He acknowledges the fact that MCI is not a fixed entity, but rather a moveable concept, which will inevitably change as dementia becomes better understood. It is as if MCI is merely a stepping-stone towards the goal of better understanding of dementia and improved early diagnosis.

One of the problems with a shifting concept such as MCI is that the term is not used in a uniform way by researchers and clinicians. The editor acknowledges that, at a conference on MCI in Chicago in 1999, although there was general agreement that the topic of MCI was important, there was little consensus as to how MCI should be defined. The term MCI is most commonly used in the restrictive sense of problems in memory. This is reflected in the clinical criteria for MCI, produced by the Mayo Alzheimer Disease Center, which comprise: (i) memory complaints, preferably corroborated by an informant; (ii) objective memory impairment for age and education; (iii) largely intact general cognitive function; (iv) essentially preserved activities of daily living; and (v) not demented. An assumption underlying this usage is that MCI is a prodrome to Alzheimer's disease. However, MCI is construed by other authors in a broader sense to include any subtle impairment of cognition that is regarded as of insufficient magnitude to qualify for the designation of dementia. Thus, it may constitute impairment in a non-memory domain or even multiple cognitive domains. Moreover, it may be the harbinger of any one of a number of dementing illnesses, including vascular dementia, frontotemporal dementia and Lewy body dementia.

Clearly, differences in definition make comparisons across studies problematic. Undoubtedly, the frequency with which MCI progresses to Alzheimer's disease depends on how MCI is characterized at the outset, both with regard to the specificity and nature of symptoms and the method by which 'not demented' is determined. Not surprisingly, findings across studies are variable. Conceptual issues surrounding the definition of MCI are themes that arise repeatedly throughout the text, and are skilfully explored.

Multi-author texts run the risk of a lack of cohesiveness of style and content. The multiple authorship of this book largely works to its advantage. The contributors address the theme of MCI from a variety of professional perspectives: neurology, neuropsychiatry, neuropsychology, neuroimaging, neuropathology and neurobiology. The result is a spectrum of viewpoints that gives the reader a flavour of the breadth and varied notions of MCI. In general, however, the emphasis of this book is on MCI as a prodrome to Alzheimer's disease. Indeed, several chapters are written from the standpoint that MCI is synonymous with early Alzheimer's disease. The chapter on neuropsychiatric symptoms focuses exclusively on early neuropsychiatric manifestations and risk factors for Alzheimer's disease: depression, anxiety, psychosis, personality alterations, and their patho-

physiology and neurobiology. A chapter on magnetic resonance imaging deals with imaging in Alzheimer's disease and in people at risk of developing Alzheimer's disease. A chapter on treatments for MCI examines the range of treatments and treatment strategies for Alzheimer's disease. The overview chapter by the editor, which outlines alternative concepts of MCI, is valuable in putting these focused chapters into perspective.

This book provides a comprehensive and highly accessible account of current thinking about MCI, which will be useful for clinicians and researchers who are interested in ageing and dementia. I suspect that the concept of MCI will undergo rapid revision, so that a new updated edition may be required within a few years. In the meantime this volume provides a valuable resource.

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