

# Can be sleep disturbances as prodromal of MCI?

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## Opinion

The world's elderly population grows at an unprecedented rate; although inevitable and has contrary effects on socioeconomic of community, the health of older people and finally quality of life. This worldwide phenomenon unavoidably result in increasing number of age-related disorders specially neurodegenerative disorders such as Alzheimer's disease (AD) and Mild Cognitive Impairment (MCI).<sup>1</sup>

Mild cognitive impairment has been considered as middle stage from normal aging to dementia. About 12% persons with this condition develop Alzheimer's disease annually, and 80% at 6 years follow-up.<sup>2,3</sup>

Although, MCI has not been known as an obvious dementia, could be the preclinical or very early stage of AD. Since diagnosis criteria for MCI are still debatable, early detection of MCI is invaluable.<sup>4</sup> However, Petersen et al.<sup>5</sup> in 2004 has defined the essential features of these criteria for MCI include, memory complaint reported mostly by an informant, objective memory impairment for age, essentially preserved general cognitive function, and of course, largely intact functional activities.<sup>5</sup> Totally, MCI is classified into two categories. The above mentioned criteria usually define the amnesic MCI subtype (a-MCI), but, the second one is when no memory impairment is present (na-MCI).

For more experts that work in the field, combination of evaluations can account for a passable diagnosis of MCI. These evaluations include clinical features, neuropsychological testing, biomarkers and neuroimaging. The neuropsychiatric symptoms as a branch of clinical features, have been extensively studied and the most common are apathy (11.7–68%), depression (20–56%), anxiety (14.1–54%), and sleeping problems (18.3–56%).<sup>6–9</sup> Since sleep plays a crucial role in learning and memory across the lifespan, and thus is it not surprising that its disturbances and even deprivation is also associated with the decline in cognitive functioning and in degenerative diseases increasing amyloid- $\beta$ .<sup>10,11</sup> Recently, some studies have indicated alterations of phasic events of NREM sleep in MCI/AD patients as integrated signs of cognitive problems.<sup>12–14</sup> Sleeping problems are common in dementia in which they result in a deterioration of memory because the consolidation of memories is made during the sleep time. Consequently, the alterations in the person's brain with AD or MCI can led to alterations in sleep architecture.<sup>15</sup>

By and large, it is recommended beside of common cognitive evaluations for MCI detection, the evaluation of sleep, as non-cognitive feature in those with possible risk for dementia may be relevant and maybe necessary and because a lot of studies have demonstrated that sleep disorders treatment improves cognitive performances, it could be considered as a target for early intervention.

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## Conflicts of interest

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