

Whether Mild Cognitive Impairment Really Improves with Cataract Surgery Requires Extensive Research

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LETTER TO THE EDITOR

We read with interest Yoshida, *et al.*'s article on a prospective, observational, multicentre study on the effects of cataract surgery on cognitive functions in 39 dementia patients and 49 mild cognitive impairment (MCI) patients conducted between 2019 and 2021 [Yoshida, Y. *et al.*, 2023]. Cognitive functions were assessed by using the mini-mental state examination (MMSE) and the MMSE-blind test for persons with visually impairment [Yoshida, Y. *et al.*, 2023]. The MMSE was found to improve in the MCI group compared to the dementia group [Yoshida, Y. *et al.*, 2023]. It was concluded that cataract surgery increases MMSE in MCI patients and that the likelihood of improvement depends on the preoperative cognitive state [Yoshida, Y. *et al.*, 2023]. The study is impressive, but several points require discussion.

The major limitation of the study is that cognitive functions were only measured using MMSE [Yoshida, Y. *et al.*, 2023]. A comprehensive neuropsychological evaluation is required to determine which specific cognitive domains were impaired before and after cataract surgery. Only a detailed neuropsychological examination examining various brain functions such as attention, concentration, memory, visual perception, language and problem solving skills, can determine whether there is actually a difference between the two groups and before and after surgery.

A second limitation is that mood was not included in the assessment. Visual impairment due to cataracts can be a common cause of or contribute to depressive moods or anxiety [Choo, C.H. *et al.*, 2023]. Therefore, it would have been desirable to test all enrolled patients for the presence or absence of depressive symptoms using the patient health questionnaire-9 (PHQ-9), Becks depression inventory (BDI), Hamilton depression scale, or the hospital anxiety and depression scale (HADS).

Because depression is often misinterpreted as cognitive dysfunction [Defrancesco, M. *et al.*, 2009], it is important to rule out depression and anxiety as the cause of suspected cognitive decline. A strong argument for improvement in depression is that the MMSE did not change in dementia patients but only in MCI patients.

A third limitation of the study is that the type and cause of dementia in the 39 included patients were not specified. We should know how many suffered from Alzheimer's disease, how many from vascular dementia, frontotemporal dementia, Lewy body disease, alcohol-related dementia, HIV-associated dementia, Creutzfeld-Jacob disease, Huntington's disease, Down syndrome, mixed dementia, and how many had dementia due to chronic traumatic encephalopathy. Different types of dementia may respond differently to cataract surgery.

A fourth limitation is that current medication was not included in the assessment. Knowledge of current medications is critical because several medications can affect cognitive functions and mood positively (e.g. antidepressants) or negatively (e.g. neuroleptics, anti-seizure drugs). Were medications stopped or added after cataract surgery?

A sixth limitation is that no healthy controls were included in the evaluation. It should also be stated how many completed the MMSEs and how many completed the MMSE blind.

To sum up, the excellent study has limitations that should be addressed before final conclusions are drawn. Clarifying the weaknesses would strengthen the conclusions and improve the study. Before concluding that cataract surgery improves cognition, comprehensive, validated neuropsychological testing must be performed before and after surgery to assess the nature and extent of cognitive dysfunction. More likely than improvement of cognition, recovery from

depression is possible in patients with MCI or dementia, which may mimic improvement in cognition.

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