



# Obsessive-Compulsive Disorder in Patients with Mild Cognitive Impairment: A Comparative Study with Healthy Older Adults

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## ABSTRACT

**Objective:** Mild cognitive impairment (MCI) is considered as a prodromal state and a risk factor for dementia. To best of our knowledge, no previous studies have examined the relationship between Obsessive-Compulsive Disorder (OCD) and MCI. One of the risk factors for the development of MCI may be OCD. In this study, we hypothesized that the patients with MCI had significantly higher rate of OCD than healthy elders, and some types of preexisting OC symptoms may be associated with MCI.

**Methods:** A total of 66 subjects were assessed for severity of cognitive impairment using the Mini-Mental State Examination (MMSE), Clinical Dementia Rating Scale (CDR), and Addenbrooke's Cognitive Examination III tests (ACE-III). Lifetime diagnosis of OCD was assessed through Structured Clinical Interview of DSM-IV Axis I disorders (SCID-I). The severity of OCD, and the content of previous Obsessive-Compulsive (OC) symptoms were measured by Yale-Brown Obsessive Compulsive Scale (YBOCS).

**Results:** MCI patients had more previous depressive episodes, and a lifetime diagnosis of OCD when compared with healthy subjects. Educational level was significantly lower in MCI patients than in healthy elders. The contamination obsessions, cleaning, and checking compulsions were significantly higher in the patients with MCI than in healthy subjects.

**Conclusion:** Our findings may demonstrate that lower educational level, previous OCD, checking compulsions, and current anxiety and depression severity appeared significantly associated with MCI. We suggest that previous OCD and checking OC symptoms may be related to earlier stages of memory dysfunction.

## Introduction

Mild cognitive impairment (MCI) represents an intermediate stage of cognitive impairment between the normal cognitive aging and dementia. The prevalence of MCI in elderly people ranges from 3% to 20% [1]. MCI is often considered as a prodromal phase of Alzheimer's Disease (AD) that is estimated to proceed into dementia at a rate of approximately 10% per year [2]. MCI is characterized by mild cognitive decline,

progressive neuronal loss, the formation of NFTs, the deposition of A $\beta$  within the brain, and no significant disability [3]. Based on the type or domain of cognitive deficit, four MCI subtypes have been proposed: Amnesic MCI-Single Domain, amnesic MCI-Multiple Domain, Non-Amnesic MCI-Single Domain, and Non-Amnesic MCI-Multiple Domain [4].

It has been shown that many modifiable factors including hypothyroidism, vitamin B12 deficiency, normal pressure hydrocephalus,

and subdural hematoma are associated with an increased risk of developing MCI among healthy older adults [5]. Hypertension, lower serum folate levels, high total serum cholesterol, alcohol consumption, a low level of physical activity, diabetes, insomnia, and the presence of neuropsychiatric symptoms can play a role in the cognitive decline and development of MCI. Older age and being single remained to be risk factors for MCI among older adults with multimorbidity. Some studies found that healthy older subjects with lower or no education were more likely to develop MCI than those with higher education level.

MCI patients have a 35%-75% prevalence of various neuropsychiatric symptoms including anxiety, depression, apathy, and irritability. There is growing evidence indicating a link among depression, MCI, and AD. Studies have shown that patients with MCI having depressive symptoms are more likely to develop AD than those without depression. Depression is supposed to be related to a higher rate of progression along the neurodegenerative spectrum from MCI to dementia.

Obsessive–Compulsive Disorder (OCD) is a psychiatric disorder characterized by uncontrollable, reoccurring thoughts (obsessions) and/or behaviors (compulsions). In patients with AD and OCD, impairments in executive functions may have a secondary influence on other functions, including memory. Neuroimaging studies of OCD emphasized the dysfunctions in the frontal–subcortical circuit involving the orbitofrontal cortex, anterior cingulate, striatum, and thalamus. The role of serotonin, dopamine and glutamate in OCD is well known. Moreover, central cholinergic systems might also be involved in the pathophysiology of OCD. Since the glutamatergic system play an important role in memory and information processing, al-

terations in this system contribute to neuropsychopathology in AD. Imaging studies have indicated that 5-HT<sub>2A</sub> receptor loss, and an imbalance between the cholinergic and serotonergic systems may account for the cognitive impairment associated to AD.

Some studies reported that Obsessive-Compulsive (OC) symptoms most frequently occurred prior to the clinical diagnosis of frontotemporal dementia. In a case with late-onset and treatment-refractory OCD, dementia developed after 7-years. An old woman with cognitive impairment and some behavioral disturbances had also a past history of severe OCD. In a recent study, the authors found that the mean number of lifetime compulsions seemed to predict the diagnosis of AD. They also reported that preexisting hoarding and checking obsessions and compulsions were related to occurrence of AD.

To best of our knowledge, no previous studies have examined the relationship between OCD and MCI. Since MCI is generally considered as a prodromal state and a risk factor for dementia, it is possible that factors associated with dementia are also linked to MCI. One of the risk factors for the development of MCI may be OCD. Therefore, the primary purpose of this study was to compare the rate, severity, and content of previous OCD in patients with MCI and in healthy older subjects. We hypothesized that the patients with MCI had significantly higher rate of OCD than healthy elders, and some types of pre-existing OC symptoms may be associated with MCI.

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### Methods

The study design was approved by the local ethic committees and all participants or their caregivers gave informed consent for participation. We screened patients who consecutively admitted to Neurolo-

gy Department of Aydin Adnan Menderes University for the diagnoses of MCI. The subjects were not cognitively impaired sufficiently to meet the DSM-IV-TR criteria for dementia. Control participants included individuals who were considered cognitively normal by clinical evaluation. Exclusion criteria for the all participants included dementia, lifetime or current substance use disorder, psychosis, bipolar disorder, head injury, visual or hearing impairments, or neurologic disorders. All the subjects had a full neurological examination, the usual blood tests and brain computed tomography scan or Magnetic Resonance Imaging (MRI). The subjects who had no caregiver at the time of assessment were also not included into the study. The caregiver was a relative of the patient who had constant, daily contact with the patient. Because the patients with cognitive impairments may give unreliable reports, we administrated the clinical scales by obtaining information also from the caregivers who had a detailed knowledge of the patient. The patients except eight were receiving at least one antimentia drug at the time of evaluation. All clinical and demographic data were obtained through a semi-structured case report form.

A total of 66 subjects were included in the study sample. Patients with MCI were diagnosed by clinical consensus fulfilled the diagnostic criteria for Amnesic MCI-Multiple domain as defined by Petersen.

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### Conclusion

In conclusion, our findings may demonstrate that the patients with MCI had more severe current OCD, and depression, and had more contamination obsessions, cleaning and checking compulsions when compared with healthy subjects. In particular, lower educational level, previous OCD, and checking compulsions appeared significantly associated with MCI even after controlling for previous depression, and

other OC symptoms. Although it is not clear whether OCD is a risk factor, or an early manifestation for later cognitive impairment, our findings may demonstrate that previous OCD and checking OC symptoms may be related to earlier stages of memory dysfunction. Clinicians should assess the cognition of individuals with OC symptoms and should monitor those with OC symptoms for evidence of cognitive impairment from MCI to AD.

Several limitations of this study should be noted. First, it is important to declare the predictive limitation of this cross-sectional study, since we simultaneously assessed the patients MCI. Further longitudinal clinical, genetic and neuroimaging investigations are required to determine if lifetime OCD and some types of OC symptoms would predispose to the development of later cognitive impairment. Most notably, retrospective evaluation of depression and OCD may be biased by the patients and their caregivers. Moreover, we could not assess the number of lifetime depressive episodes, and the ages at onset of depression and OCD. We should also emphasize that we did not evaluate the type and duration of previous antidepressant treatments. So, the drug use might have influenced the scores of CDR, ACE-III, and MMSE.

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### References

1. Busse A, Bischkopf J, Riedel-Heller SG, et al. Mild cognitive impairment: prevalence and incidence according to different diagnostic criteria: results of the Leipzig Longitudinal Study of the Aged (LEILA75). *Br J Psychiatry* 182: 449-454 (2003).
2. Sarah TF, Deborah ACW, Danielle JH, et al. Longitudinal changes in memory and executive functioning are associated with longitudinal change in instrumental activities of daily living in older adults. *Clin Neuropsychol* 23: 446-61 (2009).
3. Petersen RC, Smith GE, Waring SC, et al. Mild cognitive impairment: clinical characterization and outcome. *Arch Neurol* 56: 303-308 (1999).
4. Petersen RC, Doody R, Kurz A, et al. Current concepts in mild cognitive decline. *Arch Neurol* 58: 1985-1992 (2001).
5. Winblad B, Palmer K, Kivipelto M, et al. Mild cognitive impairment- beyond controversies, towards a consensus: report of the International Working Group on mild cognitive impairment. *n* 256: 240-246 (2004).