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Depression and Conversion to Dementia in Mild Cognitive Impairment

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ABSTRACT

Mild cognitive impairment (MCI) is a stage of aging that occurs between normal aging and dementia (precedes dementia). Patients with MCI have memory loss who is otherwise functioning normally and does not match the clinical diagnosis criteria for dementia. MCI is frequently accompanied by cognitive deficits and non-cognitive. One of the most frequent non-cognitive deficiencies is depression. Depression and mild cognitive impairment are closely associated particularly in the elderly and can progress into neurodegenerative disorders like dementia. This indicates that there is a connection that needs to be explored further. Through this review article, a theoretical review of the relationship between MCI with depression and its conversion to dementia.

1. Introduction

Mild cognitive impairment (MCI) is a stage that occurs between normal aging and dementia (precedes dementia).¹ Patient with MCI has memory loss and is otherwise functioning normally and does not match the clinical diagnosis criteria for dementia.²

The frequency of MCI affects 10-15% of the population over the age of 65.³ MCI will develop into neurodegenerative disorders such as dementia.⁴ 11% to 33% of MCI patients develop dementia within 2 or 3 years.^{1,4}

MCI is frequently accompanied by cognitive deficits and non-cognitive which have been documented to alter the presentation and course of the disease.¹ Cognitive deficit when compared to age- and education-matched controls (though they are less impaired than dementia patients) and have substantially intact activities of daily life.² The non-

cognitive aspects include depression, anxiety, and apathy are common in the pre-dementia phase, dementia, and even normal aging.⁵ However, depression is the highest prevalence in non-cognitive aspects.⁶

People with MCI are more likely to suffer from depression, with rates ranging from moderate (36% to 63%).⁷ Depression in MCI patients has been studied rather infrequently. A population-based epidemiological study of 320 patients with MCI found that 138 (43%) had neuropsychiatric symptoms, with depression accounting for 20%.⁸ Depression is the most researched neuropsychiatric symptom in MCI patients, and it's been linked to cognitive impairment as well as a twofold increased chance of advancement.

⁹

Depression is an essential acceleration factor in the progression and conversion from a cognitively normal condition to MCI according to the majority of research.⁹ One study found that depressive symptoms were one of the multiple risk factors for MCI and dementia.⁶ A subpopulation of older persons with a combination of MCI and recently active depression is particularly at risk.^{2,4}

Depressed people are more likely to develop MCI, according to other studies.^{6,8} There are more amyloid anomalies in depressed people than in non-depressed patients.⁶ MCI with A β is linked to an increased incidence of neuropsychiatric symptoms.¹

This shows that there is a reciprocal relationship between MCI and depression. Therefore, more in-depth knowledge is needed to find out the relationship.

Mild Cognitive Impairment (MCI) and depression

MCI is frequently accompanied by behavioral abnormalities and psychiatric symptoms, which have been documented to alter the presentation and course of the disease.¹ MCI is usually accompanied by cognitive and non-cognitive abnormalities, which have been shown to influence the disease's presentation and progression.² When compared to age- and education-matched controls, dementia patients exhibit significantly fewer cognitive deficits and have largely intact everyday activities.²

The risk of MCI increased with the frequency of depressive symptoms at baseline in older persons with normal cognitive function.⁹ MCI patients have a higher chance of developing more severe cognitive impairment, as well as subtle impairments in daily functioning and co-occurring depressive symptoms. The probability of acquiring MCI was more than doubled in those with moderate or high depressed symptoms, which matches the findings of a meta-analysis of the association between depressive symptoms and dementia risk.¹⁰

Cognitive impairment is part of depression and is included in the DSM criteria; reduced processing speed and executive function, attention, and amnesic functions are frequent findings.¹ Depressed person

who was older were more likely to have cognitive deficits than those who were younger.^{1,4,10}

Patients with MCI had 16.9%-55% depressive symptoms, of which 11%-30% were older adults. This means that MCI patients had higher rates of depression than healthy people, regardless of their age, race, gender, or research type.¹ The vast variety of depression prevalence in MCI patients is due to the many MCI definitions, depression instruments, and criteria. According to a meta-analysis, depression affects 32% of MCI patients. Other research has found that people who are depressed are more likely to develop MCI.¹

Depression is one of the most common disorders in old age. According to the World Health Organization, the rate of depressive disorders in the senior population ranges between 10% and 20%. Prevalence rates range from 1% to 16 percent for major depression, 2% to 19% for minor depression, and 7.2% to 49% for clinically relevant depressive symptoms in elderly people living in the community or in nursing homes in the United States.¹⁰

Some reports mention depression discrepancies between ethnic groups. Depression, for example, is more common among Hispanics than in non-Hispanic whites, with similar or higher reported levels compared to African Americans in preretirement age. When compared to non-Hispanic Americans, Hispanics have fewer years of schooling and a worse socioeconomic level, both of which contribute to depression.¹⁰

Neuropsychiatric syndromes of apathy and depression may represent earlier signs of neurodegeneration than cognitive or functional impairments, and these behavioral prodromes may also predict different cognitive and functional trajectories.^{1,10} Depressive symptomatology may occur a decade or more before a cognitive loss occurs.

Early definitions of MCI did not include functional impairment, but newer research has found that MCI is associated with varying degrees of functional impairment. Furthermore, functional impairment is a defining feature of MCI and is somewhat reliant on the

severity of cognitive impairment, and functional ability appears to be more closely linked to depression.¹

Depressed people have slower processing speeds, perform worse on tasks requiring selective attention, reaction inhibition, and performance monitoring, and have slower acquisition and recall of new knowledge. Short-term memory problems are linked to late-life depression. Depressive symptoms are associated with memory complaints and poor cognitive performance in older people without dementia. MCI patients with depression also exhibit poorer scores on indicators of immediate and delayed memory than MCI patients without depression. Memory function was significantly lower in patients with MCI and stable depression, and executive function, dementia screening, flexibility, and lexico-semantic function were significantly worse in MCI patients with stable depression than in MCI patients without depression. MCI patients with depression exhibit lower immediate and delayed memory indices than MCI patients without depression.¹

Depression and mild cognitive impairment (MCI) are common in the elderly, having individual and combined effects on the development of neurodegenerative disorders such as dementia.⁴ Depression and cognitive problems have a complicated relationship. Depression has long been associated with the development of Alzheimer's disease (AD) in epidemiological research.⁴ In the community of MCI patients with depression, the reported annual conversion rate of MCI to dementia was between 25% and 28%; MCI patients with stable depression had a considerably greater incidence of conversion to AD (31%) than MCI patients without depression.¹

Depression and mild cognitive impairment are closely associated particularly in the elderly.¹ The majority of studies on depression and cognition in the elderly have focused on late-onset depression (LOD; defined as depression that develops after the age of 60), rather than early-onset depression (EOD; occurring before age 60).¹⁰ LOD is associated with a higher level of medical comorbidity, as well as more frontal-subcortical damage and white matter lesions,

resulting in significant cognitive impairment and poor treatment response.¹⁰

The relation between depression and moderate cognitive impairment (MCI) is, however, complex.¹¹ In contrast to other writers who correlate depression with MCI, other authors have discovered that depression is associated with a subtype of frontal cognitive impairment caused by a suspected vascular etiology that does not usually develop into dementia.¹¹

Patients with depression had higher amyloid anomalies than those without depression. MCI with A β burden is related to a higher incidence of neuropsychiatric disorders. MCI patients have a high risk of developing more severe cognitive impairment, as well as modest impairments in everyday functioning and co-occurring depressive symptoms.¹

Anxiety and depression were discovered to be a substantial risk factors for MCI, as were depressive symptoms.⁸ The incidence of depression in MCI patients varies depending on the diagnostic criteria used to classify MCI and its subtypes. Subjects with MCI, particularly those with amnesic MCI, are more likely to develop depression than those with normal cognitive function.¹

There is no difference in depression rates between aMCI and non-aMCI groups. MCI patients with depressive symptoms had more severe behavioral symptoms and verbally agitated behavior.¹ Failed to reveal a link between depression and cognitive decline because the data is mixed.¹ The methodological discrepancies between research in terms of depression and MCI measures are one cause for the disagreement.⁶ Because the association between MCI and depression is so complex, even research using similar measures can produce inconsistent results.¹ For example, it's uncertain if depression is caused by underlying neurodegeneration or is simply a reaction to the MCI patient's apparent cognitive impairment. Depression can also cause cognitive impairment, which can show as MCI despite the fact that the symptoms are reversible.^{1,6} Some studies show that MCI has a relationship with depressive symptoms but there are also studies that show no relationship. For

this reason, other research is needed in order to see the existence of a mutually influencing relationship.¹

MCI and depression have a higher conversion rate to dementia

The progression of MCI patients with depression to dementia was between 25% and 28%; MCI patients with depression had a substantially higher progression to AD (31%) more than MCI patients without depression supported by the results of the log-rank test.¹ Previous research has indicated that in the general population conversion rate from MCI to dementia is 4.2%, and in high-risk clinical samples, it is 10%–15 percent.⁴

Depression is a major risk factor for dementia and is linked to more atrophy in AD-affected areas; thus, depression in people with MCI could be linked to underlying neuropathological changes, and depression could be a useful clinical marker for identifying MCI patients who are most likely to develop AD.¹

Furthermore, multiple studies have demonstrated that depression may have a role in the transition from normal cognition to MCI, as well as the transition from MCI to dementia. Depression is an essential acceleration factor in the progression and conversion from a cognitively normal condition to MCI and dementia, according to the majority of research.

Late-life depression is a significant risk factor for normal people developing MCI. The “always depressed” have a somewhat increased risk of progression from MCI to AD. The progression of Alzheimer's disease can be tracked in a variety of methods, including daily cognitive and instrumental activity daily.¹ The link between depression and dementia has sparked a long-running discussion about the underlying causes and causality. There is a lot of evidence that depression is a true dementia risk factor.

Depression could also be a symptom of a related risk factor (confounder), such as cerebrovascular disease, or an early prodromal symptom, an early sign of neurodegenerative changes that occur in dementia, a psychological reaction to cognitive and functional

disability (“cognitive burden”), or a psychological reaction to cognitive and functional disability (“cognitive burden”).¹²

Depression can occur in three different stages in relation to the process of neurodegeneration in AD. Depression can be a predisposing risk factor occurring before the onset of AD pathology. It might also be an early sign of neurodegenerative changes or a prodromal symptom with or without cognitive deficits.¹² Finally, it may occur at the more advanced dementia stage of AD.¹² In every stage depression is an important accelerating factor contributing to the clinical progression and conversion from a preclinical state to MCI and to dementia. Depression is a major accelerating factor in clinical progression and conversion from a preclinical condition to MCI and dementia at every stage.¹²

However, there has been researching that has come to the opposite result. Patients with depressive symptoms had no elevated.¹ risk of Alzheimer's disease, according to a three-year prospective trial of MCI outpatients. According to one study, depression had a significant unfavorable impact on MCI patients' conversion to AD.¹³ Another study found that depression symptoms are unrelated to the rate of progression to dementia in MCI patients and that the relationship between depressive symptoms and dementia conversion is modified by gender.¹³

In other research, increasing endorsement of memory issues was found to be the only significant predictor of conversion to dementia, indicating that insight into cognitive problems is more important than depressive symptomatology in MCI patients.¹²

Depression is not a stable state, clinical aspects of the depression may have a role, the various results about depression in MCI could be because studies did not account for the length of depression, the incident of depression, if it was treated, and so on.⁵ Despite the well-established link between depression and MCI as well as AD/dementia, few studies have looked into which cognitive deficits may be best predicted by depressive symptoms in abnormal aging.¹⁰

Depression has been associated with cognitive impairment and dementia in a large number of epidemiological studies.⁶ The interplay between various clinical entities is complicated and not fully understood.

2. Conclusion

MCI and which depression one affects or follows are debatable. Even though "frontal-subcortical damage" has been used to describe the link between the two. Depression may have a role in the transition from normal cognition to MCI, as well as the transition from MCI to dementia as a result of neuropathological alterations. However, this is still complicated and not completely understood. Further research is needed to understand the relationship between MCI and depression in the progression of dementia.

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