Original Article ISSN (O):2395-2822; ISSN (P):2395-2814

Progressive Behavioral Impairment in Patients of Mild Cognitive Impairment.

Chepure Ashish[1], Subramanyam Alka[2], Ungratwar Apurva[3], Kamath Ravindra[4]

[1]Assistant Professor, Department of Psychiatry, Government Medical College and General Hospital, Latur, Maharashtra.
[2]Associate Professor, Department of Psychiatry, TN Medical College, B.Y.L Nair Ch Hospital, Mumbai.
[3]Senior Resident, Department of Psychiatry, Government Medical College and General Hospital, Latur, Maharashtra.
[4]Professor and Head, Department of Psychiatry, TN Medical College, B.Y.L Nair Ch Hospital, Mumbai.

Received: May 2017
Accepted: May 2017

ABSTRACT

Background: Mild Cognitive Impairment (MCI) poses 10-15% risk of progression to Alzheimer's disease (AD) with neuropsychological, behavioural deficits and changes in brain imaging. The purpose of this study was to assess and compare behavioral symptoms of MCI with healthy controls. Aims: To assess socio-demographic and behavioral symptoms profile with ACE, BEHAVE-AD in patients with MCI and healthy controls if it is significant. **Methods:** 78 consenting elderly (above 60 years) were divided into MCI and HC groups as per inclusion and exclusion criteria, assessed using Behavioural Pathology In Alzheimer's Disease (BEHAVE-AD). Date obtained was analyzed statistically. **Result:** Age and educational background of MCI stable and HC group was comparable. MCI group showed significantly higher scores in BEHAVE-AD assessment than HC group. Significantly higher behavioral symptoms like diurnal rhythm variations, affective disturbances, anxieties and phobias in MCI were also associated with increased distress to caregivers **Conclusion:** MCI can be diagnosed easily using MCI criteria, reduction in neuropsychological test scores like ACE but behavioral symptoms point towards mild behavioural impairment along with MCI. Risk of progression to AD may be identified by worsening in cognitive, behavioural symptoms. The high rate of progression of MCI emphasizes the need for early identification and intervention to prevent progression to AD.

Keywords: Mild cognitive impairment (MCI), Addenbroke's cognitive examination (ACE), mild behavioural impairment

INTRODUCTION

Alzheimer's disease (AD) is the most common form of dementia accounting for 60-70% of age-related dementia cases.[1] Efforts to diagnose AD early has led to the development of the concept of Mild Cognitive Impairment (MCI), which was described by Peterson in 1999 as a condition that puts elderly at risk of developing dementia.[2] The overall prevalence of MCI in elderly as per recent review ranges from 16-20% (In India 4,3%-14.89%)[3,4] while conversion rate of MCI to AD is 20-40%.[2,5] MCI represents an important distinct clinical entity as important as diagnoses of dementia or AD.[6] It is necessary to study longitudinal changes in neuropsychological and behavioral parameters associated with the development of AD. Behavioral changes in MCI are described as the "Mild Behavioural Impairment" (MBI) which may be present in the form mild psychiatric symptoms like disinhibited behaviour, cognitive complaints, normal activities of daily living, and absence of dementia. It is also proposed that patients with behavioural symptoms converted to dementia much faster than patients with MCI. So presence of neuropsychiatric symptoms thus appears to be a marker of MCI severity.[7]

Identification of MCI is thus crucial to early intervention. There is lack of data for behavioral characteristics in MCI patients; and then further which of these convert to dementia in Indian context. The purpose of this study is to analyze and compare behavioral factors among healthy and MCI patients.

Name & Address of Corresponding Author
Chepure Ashish
Assistant Professor, Department of Psychiatry,
Government Medical College and General Hospital,
Latur,
Maharashtra.

MATERIALS AND METHODS

It was a cross sectional observational study conducted after receiving approval by the Institutional Ethics Committee, geriatric patients and healthy geriatric participants in the Psychiatry outpatient department of a tertiary care teaching institute were randomly selected and assessed. Total 78 participants agreed to participate in the study and after taking written informed consent for participation in the study they were divided into

MCI and Healthy Control (HC) groups as per inclusion and exclusion criteria by screening them with Addenbrooke's Cognitive Examination (ACE). A semi structured proforma was used to interview and collect demographical and relevant data from both groups. Behavioural Pathology In Alzheimer's Disease (BEHAVE-AD) scale was applied to each participant. The data was organized into MS-Excel sheet and was processed by a statistician via statistical software SPSS-Version 20. Descriptive analysis was done for socio-demographic data. BEHAVE-AD parameters of both groups were compared against each other using Mann-Whitney U test taking P value <0.05 as a statistically significant.

RESULTS

*** 'MCI' for Mild Cognitive Impairment*; 'HC' for Healthy Control**

A. Demographics

There was no significant statistical difference between mean age of MCI and HC groups (p value=0.216). Gender distribution was almost similar across 2 groups. In MCI group, mean of education (in years) was 6.87 ± 3.21 while in HC group it was 7.84 ± 3.50, which was not significant statistically when compared using Unpaired t test.

B. Assessment of behavioral symptoms using BEHAVE-AD - comparison between MCI and HC groups

Table 1: Assessment of behavioral symptoms in MCI vs. HC groups using Independent sample Mann-Whitney U test, statistically significant if (p value <0.05).

	MCI n=31	HC n=45	p value (sign. If <0.05)
	Mean ± SD	Mean ± SD	
Psychotic features	0.00 ± 0.00	0.00 ± 0.00	-
Activity disturbances	0.06 ± 0.34	0.00 ± 0.00	-
Aggressiveness	0.09 ± 0.38	0.00 ± 0.00	-
Diurnal rhythm variation	0.33 ± 0.54	0.00 ± 0.00	<0.001
Affective disturbances	0.54 ± 0.56	0.06 ± 0.25	<0.001
Anxieties phobias	0.42 ± 0.50	0.06 ± 0.25	<0.001
Global rating	0.09 ± 0.29	0.00 ± 0.00	<0.001
BEHAVE-AD total score	1.45 ± 1.67	0.13 ± 0.50	<0.001

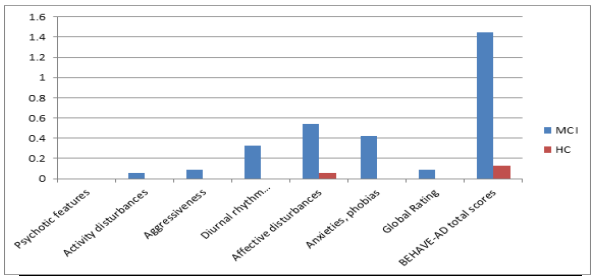

Figure 1: Comparison of behavioral symptoms in MCI vs. HC groups.

DISCUSSION

I. Socio-demographic data

Although MCI stable group had slightly more mean age but there was no significant statistical difference between these two groups. These findings are similar to epidemiological study done by Das et al. in city of Kolkata and study by Nair et al. in Mumbai.[3,8] Increasing age is a risk factor for MCI and Panza et al. had found that prevalence of MCI increases with an increase in age, it is 3% in subjects with age 60 years and above and increases to 15% in subjects with age 75 and above.[9,10]

Comparison of education of both groups was not significant statistically and is similar to findings of Das et al. (2007) who found higher prevalence of MCI in Indian population with lower educational status.[3] As such low education is proven to be a risk factor for early cognitive decline, behavioral disturbances and development of dementia.[16,17]

II. Behavioural symptoms in patients with MCI and healthy controls

Neuropsychiatric manifestations are very common in MCI, occurring in 35–75% of patients. Depression is one of the very common behavioral symptoms in MCI along with other behavioral symptoms. Other common behavioral symptoms are apathy, anxiety, depression, irritability and agitation. Euphoria, psychotic symptoms, disinhibited behavior and sleep disturbances are less common.[13]

Using BEHAVE-AD scale to assess behavioral symptoms in MCI group and HC group; psychotic features (delusions and hallucinations), activity disturbances, aggressiveness were not observed in MCI as well as HC group. Geda et al. reported only 4% of their MCI cohort suffered from agitation while many had disinhibited behavior and irritability, but there was no significant difference than normal elderly.[14] While the CHS Cognition study reported that 3-11% of their MCI patients experienced agitation, disinhibition as measured by the NPI.[15]

Diurnal rhythm variations as measured by BEHAVE-AD were significantly more in MCI group than HC group which is consistent with finding that the prevalence of sleep disturbances in MCI is intermediate between that of normal aging and dementia. Lyketsos et al. and Geda et al. observed sleep problems were one of the four most common neuropsychiatric symptoms of MCI and they were considered clinically significant.[14,15] Sleep disturbances could represent a potential marker for the deterioration of the cognitive and functional status from MCI to specific subtypes of dementia.[14,16]

Affective disturbances were more common in MCI than HC group similar to observations made by other studies. These symptoms were low mood, loneliness,

crying spells. Depression and apathy are risk factors for dementia and appear to be most useful for identifying MCI subjects at highest risk of developing dementia. Depression in MCI has been reported to double the risk of dementia.[17,18]

Anxiety symptoms in MCI group were significantly higher than those in HC group. Studies suggest anxiety symptoms remain one of the most common neuropsychiatric symptoms in MCI.[13] Hwang and colleagues(45) reported the prevalence of anxiety among tertiary center MCI patients to be 25%. Geda et al. observed anxiety in only 11% of their MCI population.(14) Contrary to our finding, Kumar et al.[19] used the Goldberg Anxiety Scale for assessment of anxiety in MCI and observed, anxiety in MCI is not significantly greater than the rate observed in normal controls.

Perceived distress by relatives measured by global rating was significantly more in MCI than HC group, which means behavioral symptoms due to MCI were more troubling for caregivers of MCI and not to caregivers of HC group. Our finding corroborates observation of another study done using NPI which found distress caused by neuropsychiatric symptoms is significantly more in caregivers of MCI than HC group.[20]

As per Engelborghs et al. classification of BEHAVE-AD scores, MCI group had mild behavioral symptoms whereas HC group has none. Study by S. Van der Mussele et al.[21] observed the prevalence and severity of frontal lobe symptoms, physical and verbal aggressiveness, activity disturbances, and delusions were intermediate between normal aging and AD in their comparative study of MCI, AD and normal subjects. Taragano et al.[22,23] proposed a term 'mild behavioral impairment' (MBI) for behavioral symptoms observed in MCI. MBI consists of persistent behavioral changes, mild psychiatric symptoms, non-serious cognitive complaints, normal activities of daily living; and absence of dementia. This mild behavioral impairment puts a person with MCI with neuropsychiatric symptoms at a risk of progressing to dementia at a faster rate than the MCI group without any neuropsychiatric symptoms.

CONCLUSION

Age and educational background of MCI and HC group did not show much difference and were comparable in our study, contrary to literature findings which suggest increasing age puts a person at the risk of MCI and lower education increases risk of cognitive decline and MCI. Mild cognitive impairment is not just impairment in cognition but MCI patients also have more behavioral symptoms than healthy controls. Significant behavioral symptoms like diurnal rhythm variations, affective disturbances, anxieties and phobias are increased along with cognitive decline and associated with increased distress to caregivers. Worsening of these symptoms might accompany cognitive decline leading to Alzheimer's disease. Detailed assessment by techniques like MRI volumetric analysis and neuropsychological testing may help us pick up the progression early, even without the necessity of an expensive PET scan. Studying further to identify risk factors and use of lifestyle modifications in patients with MCI will help in preventing further progress into AD and initiate therapeutic interventions on time. Limitations of this study include small sample size, study sample was not community based, longer duration of follow up required to assess for changes in cognition along with behavior.

REFERENCES

1. Schaeffer EL, Figueiro M, Gattaz WF. Insights into Alzheimer disease pathogenesis from studies in transgenic animal models. Clinics (Sao Paulo).2011 Jan;66 Suppl 1:45–54.
2. Petersen RC, Smith GE, Waring SC, Ivnik RJ, Tangalos EG, Kokmen E. Mild cognitive impairment: clinical characterization and outcome. Arch.1999 Mar;56(3):303-9.
3. Das SK, Bose P, Biswas a, Dutt a, Banerjee TK, Hazra a M, et al. An epidemiologic study of mild cognitive impairment in Kolkata, India. Neurology. 2007 Jun 5;68(23):2019–26.
4. Sosa AAL, Albanese E, Stephan BBCM, Dewey M, Acosta D, Ferri CP, et al. Prevalence, distribution, and impact of mild cognitive impairment in Latin America, China, and India: a 10/66 population-based study. Gandy S, editor. PLoS Med. Public Library of Science; 2012 Feb ;9(2):e1001170.
5. Roberts R Knopman DS. Classification and Epidemiology of MCI. Clin Geriatr Med 2013 Novemb ; 29(4):1–19.
6. Petersen R. Mild cognitive impairment as a diagnostic entity. J Intern Med. 2004;18(8):674–83.
7. Feldman H, Scheltens P, Scarpini E, Hermann N, Mesenbrink P, Mancione L, et al. Behavioral symptoms in mild cognitive impairment. Neurology. 2004 Apr 13;62(7):1199–201.
8. Nair G, Van Dyk K, Shah U, Purohit DP, Pinto C, Shah a B, et al. Characterizing cognitive deficits and dementia in an aging urban population in India. Int J Alzheimers Dis. 2012 Jan ;2012:673849.
9. Lipnicki DM, Sachdev PS, Crawford J, Reppermund S, Kochan NA, Trollor JN, et al. Risk factors for late-life cognitive decline and variation with age and sex in the Sydney Memory and Ageing Study. Ginsberg SD, editor. PLoS One. Public Library of Science; 2013 Jan;8(6):e65841.
10. Panza F, D'Introno A, Colacicco AM, Capurso C, Del Parigi A, Caselli RJ, et al. Current Epidemiology of Mild Cognitive Impairment and Other Predementia Syndromes. Am J Geriatr Psychiatry. 2005 Aug ;13(8):633–44.
11. Volkow ND, Logan J, Ph D, Fowler JS, Wang G, Gur RC, et al. Association Between Age-Related Decline in Brain Dopamine Activity and Impairment in Frontal and Cingulate Metabolism. 2000;(January):75–80.
12. Lopez OL, Jagust WJ, Dulberg C, Becker JT, DeKosky ST, Fitzpatrick A, et al. Risk factors for mild cognitive impairment in the Cardiovascular Health Study Cognition Study: part 2. Arch Neurol. 2003 Oct ;60(10):1394–9.
13. Apostolova LG, Cummings JL. Neuropsychiatric manifestations in mild cognitive impairment: a systematic review of the literature. Dement Geriatr Cogn Disord. 2008 Jan ;25(2):115–26.
14. Geda YE, Smith GE, Knopman DS, Boeve BF, Tangalos EG, Ivnik RJ, et al. De novo genesis of neuropsychiatric symptoms in mild cognitive impairment (MCI). Int Psychogeriatr . 2004 Mar ;16(1):51–60.

15. Lyketsos CG, Lopez O, Jones B, Fitzpatrick AL, Breitner J, DeKosky S. Prevalence of neuropsychiatric symptoms in dementia and mild cognitive impairment: results from the cardiovascular health study. JAMA. 2002 Sep 25 ;288(12):1475–83.
16. Beaulieu-Bonneau S, Hudon C. Sleep disturbances in older adults with mild cognitive impairment. Int Psychogeriatr. 2009 Aug;21(4):654–66.
17. Hwang TJ, Masterman DL, Ortiz F, Fairbanks LA, Cummings JL. Mild cognitive impairment is associated with characteristic neuropsychiatric symptoms. Alzheimer Dis Assoc Disord. 2004 ;18(1):17–21.
18. Teng E, Lu PH, Cummings JL. Neuropsychiatric symptoms are associated with progression from mild cognitive impairment to Alzheimer's disease. Dement Geriatr Cogn Disord. 2007 Jan;24(4):253–9.
19. Kumar R, Jorm AF, Parslow RA, Sachdev PS. Depression in mild cognitive impairment in a community sample of individuals 60-64 years old. Int Psychogeriatr. 2006 Sep;18(3):471–80.
20. Trivedi SC, Subramanyam A a, Pinto C, Gambhire DD. Neuropsychiatric symptoms in mild cognitive impairment: An analysis and its impact on caregiving. Indian J Psychiatry. 2013 Apr ;55(2):154–60.
21. Van der Mussele S, Bekelaar K, Le Bastard N, Vermeiren Y, Saerens J, Somers N, et al. Prevalence and associated behavioral symptoms of depression in mild cognitive impairment and dementia due to Alzheimer's disease. Int J Geriatr Psychiatry. 2013 Sep ;28(9):947–58.
22. Taragano FE, Allegri RF, Lyketsos C. Mild behavioral impairment A prodromal stage of dementia. 2008;2(4):256–60.
23. Taragano FE, Allegri RF, Krupitzki H, Sarasola DR, Serrano CM, Loñ L, et al. Mild behavioral impairment and risk of dementia: a prospective cohort study of 358 patients. J Clin Psychiatry. 2009 Apr;70(4):584–92.

How to cite this article: Ashish C, Alka S, Apurva U, Ravindra K. Progressive Behavioral Impairment in Patients of Mild Cognitive Impairment. Ann. Int. Med. Den. Res. 2017; 3(4):PY01-PY04.

Source of Support: Nil, **Conflict of Interest:** Nil.