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CHARACTERISTICS OF SELECTED COGNITIVE DOMAINS IN OLDER ADULTS WITH MILD COGNITIVE IMPAIRMENT

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ABSTRACT

Objective: This study aims to This study aimed to examine selected cognitive characteristics in older adults with mild cognitive impairment (MCI).

Subjects and Methods: The study was conducted on 40 elderly patients diagnosed with MCI at the National Geriatric Hospital from July 2024 to April 2025. Evaluated parameters included: MMSE, verbal memory, visual memory, attention, language, visuaconstruction, executive dysfunction

Results: Delayed memory was the most impaired domain: 85% performed below normal on delayed word and figure recall, and 57.5% on delayed story recall. Immediate recall showed mild-to-moderate impairment, while recognition remained relatively preserved. Naming, simple attention, and basic executive tasks were largely intact. Strong correlations were observed among delayed memory tests (r = 0.53–0.75), whereas immediate and delayed recall correlated only moderately. Recognition measures correlated highly (r = 0.77).

Conclusion: Comprehensive memory assessment is valuable for distinguishing MCI from normal aging and identifying individuals at risk of progression to Alzheimer's disease.

*Keywords:*MCI,

1. INTRODUCTION

Dementia is a major global health issue in older adults, with common causes including Alzheimer's disease (AD) and vascular dementia. Dementia imposes significant financial and caregiving burdens on both families and society. Mild cognitive impairment (MCI) represents an intermediate stage between normal aging and pathological cognitive decline or dementia. Individuals with MCI maintain independence in daily activities but exhibit impairments in one or more cognitive domains. Early identification of cognitive decline patterns in this stage is clinically important, as MCI progresses to dementia at an annual rate of approximately 10–15%. [1]

MCI is a heterogeneous condition, and patients may exhibit deficits across different domains such as verbal memory, visual memory, attention, language, or visuospatial processing. Among these, delayed memory is often considered the earliest and most prominent deficit. In Vietnam, however, detailed data describing cognitive profiles in older adults with MCI remain limited. Therefore, this study aimed to describe selected cognitive domains in older adults with MCI, thereby contributing to a better understanding of cognitive decline patterns and supporting clinical assessment.

2. SUBJECTS AND METHODS

2.1. Study design: Cross-sectional descriptive study.

2.2. Study setting and time: The study was conducted at the National Geriatric Hospital from July 2024 to April 2025..

2.3. Study subjects: Participants were adults aged ≥ 60 years who agreed to participate and were diagnosed with MCI according to DSM-V criteria. Individuals with mental disorders (schizophrenia, bipolar disorder, major depression), alcohol or drug abuse, use of psychotropic medications, subdural collections, hydrocephalus, encephalitis, brain tumors, or strategic infarcts were excluded.

2.4. Sample size: Convenience sampling. The expected sample size was approximately 40 older adults with MCI.

2.5. Study variables

Clinical characteristics included age, sex, residence, education level, clinical symptoms, MMSE score, and

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a comprehensive neurocognitive test: MMSE, verbal memory (immediate recall, delayed recall, delayed recognition, story recall), visual memory (picture recall: immediate, delayed, delayed recognition). Attention (digit span forward, digit span backward), language test (modified Boston naming,), clock-drawing test, executive dysfunction, visuomotor speed.

2.6. Data collection methods

A structured research form was used according to study objectives. Three trained internal medicine residents screened and recruited eligible patients based on DSM-V diagnostic criteria for MCI. Participants underwent clinical assessment, laboratory investigations, MMSE testing, and comprehensive cognitive testing.

2.7. Data processing and analysis

Data were analyzed using SPSS version 20.0. Continuous variables were presented as mean ± standard deviation, and categorical variables as frequencies and percentages. Cognitive test performance was examined using scores together with the proportion of participants scoring below established normative cutoffs. Pearson correlation coefficients were calculated to assess relationships among immediate recall, delayed recall, and recognition measures, in order to characterize the internal structure of memory performance in older adults with MCI. All statistical tests were two-tailed, and a p-value < 0.05 was considered statistically significant.

3. RESULTS

The study included 40 older adults with MCI, with a mean age of 71.07 ± 5.64 years (range: 60–89). Women accounted for 77.5%, 65% lived in urban areas, and 32.5% had postgraduate education.

Table 1. Memory tests

Memory tests	Mean score ± SD	Number of patients below the normal cutoff	Percentage % (n=40)
Immediate recall	12,57 ± 2,56	15	37,5
Delayed recall	2,12 ± 1,48	34	85
Delayed recognition	7,00 ± 1,88	9	22,5
Immediate story recall	4,50 ± 1,81	20	50
Delayed story recall	3,25 ± 2,38	23	57,5
Immediate picture recall	4,27 ± 2,25	26	65
Delayed picture recall	2,05 ± 1,69	34	85
Delayed picture recognition	7,92 ± 1,97	24	60

Overall, immediate word recall scores were relatively high (12.57), but delayed word recall declined sharply (2.12), with 85% of patients performing below the normal threshold. Both immediate and delayed story recall showed high error rates (50% and 57.5%). Visual memory scores were also low (4.27 and 2.05 for immediate and delayed figure recall, respectively), with corresponding abnormal rates of 65% and 85%. Recognition performance was better preserved than free recall, with lower proportions of abnormal results for both word and figure recognition.

Table 2. Language

Language tests	Mean score ± SD	Number of patients below the normal cutoff	Percentage %(n=40)
Boston	14,77 ± 0.42	0	0
Animal naming	14,05 ± 3.72	1	2,5

Language abilities were largely preserved. No participant scored below normal on the Boston Naming Test, and only one patient (2.5%) showed impairment on the animal fluency test.

Table 3. Other tests

Tests	Mean score ± SD	Number of patients below the normal cutoff	Percentage %(n=40)
Digit span forward	9,22 ± 2,09	0	0
Digit span backward	4,07 ± 1,55	13	32,5
Clock-drawing test	6,60 ± 3,69	17	42,5
Executive dysfunc-tion	13,67 ± 2,51	2	5
Visuomo-tor speed	28,65 ± 8,41	4	10
MMSE	24 ± 1,50		

Forward digit span scores were good (mean 9.22), with no errors, whereas 32.5% of participants showed impairment on backward digit span. The clock-drawing test had a relatively high abnormal rate (42.5%). Executive function scores were largely preserved (mean 13.67/15), with only 5% performing below normal. Mean visual

processing speed was 28.65 seconds, with 10% performing below normal. The mean MMSE score was 24, consistent with the diagnostic range for MCI (typically 24–26).

Table 4. Correlation of memory tests

	Immediate recall	Delayed recall	Immediate story recall	Delayed story recall	Immediate picture recall	Delayed picture recall	Delayed recognition	Delayed picture recognition
Immediate recall	1	0,54**	0,29	0,46**	-0,77	0,45**	0,48**	0,07
Delayed recall		1	0.44**	0.53**	0,64	0.49**	0.54**	0.49**
Immediate story recall			1	0.73**	-0,003	0.58**	0.45**	0.35*
Delayed story recall				1	0.32*	0.75**	0.62**	0.47**
Immediate picture recall					1	0.44**	0,25	0,24
Delayed picture recall						1	0.56**	0.33*
Delayed recognition							1	0.77**
Delayed picture recognition								1

***: P<0,001, *: p<0,05*

Delayed memory tests (word, story, figure) were strongly correlated with each other (r = 0.53–0.75; p < 0.01). Immediate recall correlated moderately with delayed recall (r ≈ 0.45–0.54). Word and figure recognition correlated strongly (r = 0.77; p < 0.001). Immediate visual recall showed limited correlation with other tests.

4. DISCUSSION

This study examined cognitive characteristics in older adults with MCI. A high proportion of participants performed below normal on memory tasks, especially delayed recall of words and figures (85%) and delayed story recall (57.5%), reflecting long-term memory impairment — a hallmark of amnestic MCI. These findings are consistent with international studies highlighting delayed recall as one of the earliest and most distinctive features of MCI. Petersen et al. (2002)[2] emphasized that poor delayed recall, particularly for word lists or images, clearly differentiates MCI from normal aging.[2] An important observation in this study is the strong consistency among delayed memory tests, demonstrated by high correlations (r = 0.53–0.75). This pattern reflects a uniform decline in long-term memory systems dependent on the hippocampus, consistent with the hippocampal–entorhinal degeneration model described in neuroimaging studies by Dickerson (2010) [3]. Moderate correlations between immediate and delayed recall (r ≈ 0.45–0.54) indicate that the deficit does not stem from impaired attention or encoding but rather from impaired consolidation and retention — a key feature of amnestic MCI. Furthermore, recognition memory showed strong correlations (r = 0.77; p < 0.001) and lower impairment rates compared to recall, reflecting relative preservation of the familiarity network in the anterior temporal cortex. This pattern is consistent with cognitive neuroscience findings by Rabin et al[4], showing that recognition remains relatively intact in early Alzheimer-type MCI, unlike in depression-related cognitive impairment. Other cognitive domains such as naming, basic attention, and executive function were largely preserved, aligning with profiles of pure amnestic MCI reported in studies by Belleville et al [5]. However, notable impairment in visuospatial and working memory tasks (clock-drawing, backward digit span) suggests a subset of patients may exhibit mild multi-domain MCI, as described in epidemiological studies by Gauthier et al[6].

5. CONCLUSION

Impairment in delayed memory, alongside preserved recognition, language, and basic attention, provides important clinical value in differentiating MCI from normal aging.

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