



Case Report

Speech, Language and Cognitive Profile of Mild Cognitive Impairment: A Single Case Study

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ABSTRACT

Heterogeneity of symptoms within and among mild cognitive impairment individuals often makes it challenging to document case reports clinically. Additionally, data on the Indian population is also limited. Therefore, our study includes a case study of a 56-year-old male with MCI from our Institute. Patient X had symptoms of mild cognitive impairment following a stroke that occurred 23 years back (vascular in origin). Both formal and informal assessments were carried out. Formal testing was done using the Montreal Cognitive Assessment. On the assessment of memory, mild deficits in working memory, episodic memory, and procedural memory were noticed. Attention span and Word-finding difficulties with reduced use of words were observed in language assessment. Problems in reasoning, problem-solving, and decision-making skills, indicating deficits in executive functioning were evident. Linguistic deficits presenting secondary to cognitive deficits in our client could have led to communication breakdowns in speech, affecting his overall quality of life.

Keywords: Cognitive-communication deficit; Memory, Executive function; Quality of Life; The Montreal Cognitive Assessment

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INTRODUCTION

Recently the label 'Mild Cognitive Impairment (MCI)' has been used to signify the intermediate condition between dementia and normal aging.¹ Individual presenting with signs and symptoms like (i) informant-corroborated history of memory symptoms, (ii) impairment in memory when measured objectively (usually < 1.5 SD on a verbal memory test), (iii) spared general cognition, (iv) activities of daily living (ADL) well preserved, and (v) no dementia, are recommended to use this label.² A recent criterion proposed included the following cognitive domains for diagnosing MCI, and four subgroups were proposed such as 1) only memory deficit; 2) memory deficit with deficits in other cognitive domains; 3) deficit in a non-memory domain; and 4) non-memory domain deficit with deficits in other cognitive domains.^{3,4}

Earlier it was suggested that MCI was characterized solely by an impairment in memory. However, it was proved that MCI could occur because of an impairment in the non-memory domain alone or multiple cognitive components being affected simultaneously.^{1,3} Therefore, to bring uniformity into the diagnosis of MCI, the international working group on MCI gave a modified criterion for diagnosis, where they stated that any cognitive impairment that fails to meet the diagnostic criteria of dementia would be categorized as an MCI.¹

The test materials, such as the Montreal Cognitive Assessment (MoCA)⁵ and the Mini-Mental State Examination (MMSE)⁶ are used to assess patients with cognitive impairment. Each case with

MCI presents with a unique set of symptoms, and there is much variability observed even within the MCI vascular type. Hence the present study seeks to know about the signs and symptoms of a case presented with MCI due to vascular cause.

CASE REPORT

A 56-year-old, right-hand dominant, South Asian male who was accompanied by his son to a premier institute in the field of Speech and Hearing and reported symptoms of mild memory loss and regression in language abilities since the past six months. The client's son reported that his father's memory had been gradually deteriorating over the past year, specifically worsening over the past six months. On further evaluation, it was revealed that he had a history of head injury 23 years ago; medical examinations revealed a blood clot, and he was under medications for the same and vitamin deficiency (details not available).

An informal assessment revealed that he could recognize familiar faces, understand emotional changes in the people around him and comprehend all the parts of speech. He required frequent repetitions and had to be prompted to understand complex sentences and commands. He could express himself using simple, syntactically correct sentences. He exhibited reduced lexical diversity on a picture description task and required repetitive cueing to initiate and maintain the topic. The rate of speech was observed to be slow but with slight slurring in connected speech. Though his reading abilities were above average, his writing legibility was noted to be poor.

The patient had a poor orientation to time when the cognition was assessed and had a shorter attention span (3-4 minutes). There were slight deficits in his working memory, episodic memory, and procedural memory, but his long-term memory and semantic memory abilities were observed to be unaffected. He displayed slight difficulties in reasoning, problem-solving, and decision-making.

His caregivers reported that he experienced mood fluctuations on certain days; however, his personality and social behavior were relatively stable. Quality of life assessment revealed that he could carry out all his activities of daily living on his own with a considerable amount of independence. He had good support from his family and was motivated to undertake the intervention.

A Computed Tomography scan, performed in July 2020, revealed a mild diffuse cerebral atrophy with changes of small vessel arteriosclerosis and lacunar infarcts in bilateral gangliocapsular regions. Formal assessment (screening) was carried out using the Montreal Cognitive assessment – Malayalam (MoCA-Mal). The scores obtained in the various subsections are shown in table 1.

Table 1: Montreal Cognitive Assessment (MoCA) results

| Domains Assessed | Score Obtained |
|------------------------|----------------|
| Visuospatial/executive | 1/5 |
| Naming | 2/3 |
| Memory | 1 |
| Attention | 5/6 |
| Language | 3/3 |
| Abstraction | ½ |
| Delayed recall | 2/5 |
| Orientation | 3/6 |
| Total score | 18/30 |

As displayed in the table mentioned above, the client had difficulty in all the cognitive domains. Therefore, based on all the evaluations, he was provisionally diagnosed as having Mild Cognitive Impairment. Challenges experienced include the reliability of findings as testing was done through virtual mode due to the ongoing COVID- 19 pandemic. The prognosis was observed to be fair due to his motivation towards therapeutic intervention and support from his family members.

The patient had attended telerehabilitation for speech therapy from August- December 2020 three times a week, with each session for 40 minutes. The details of the therapeutic activities will be profiled in a different paper.

DISCUSSION

The patient had mild deficits in working memory tasks, episodic memory, and procedural memory, which is complemented by evidence in literature^{7,8} who reported that individuals with MCI exhibit deficits in recall and verbal memory. Deficits in lexical retrieval could be attributed to the several steps involved in it including, visual processing of pictures and accessing the semantic system, searching for the representation, and then, retrieval of the verbal label. Executive function deficits could be the second reason for the reduced lexical diversity. he exhibited mild complications in executive functioning, which included difficulties with reasoning, problem-solving, and decision making. The findings from Brandt et al. (2009) suggested difficulties in either planning or problem-solving and working memory among elderly persons with MCI. Baddeley et al. (1991) reported executive function deficit due to a selective impairment in the central executive control of working memory. The onset of episodic memory deficit has been reported to lead to executive dysfunction and causes impairment in language and/or spatial cognition.⁷⁻¹⁰As he had mild deficits in the domains of executive function, we hypothesize that X might progress into dementia in the future.

The present study aimed to profile an individual's speech, language, and cognitive characteristics with vascular MCI and has two significant implications. Firstly, it would help students and clinicians to understand the profile of a client with vascular MCI. Secondly, it will help professionals unravel and inspect the various assessed domains, thus allowing for an earlier diagnosis of vascular MCI.

Strengths and Limitations of the study

The present study is the first of its kind in India. This can be a good source of information to plan assessments for cases with vascular MCI. However, the finding of this single case study cannot be generalized to other MCI cases with similar etiology as there exists an individual variation within them. Another limitation in this study is the reliability of the diagnostic procedure, as there is a lack of evidence on teleassessment in Indian languages.

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