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Abstract

Multi Infarct Dementia (MID) is defined as a disorder involving deterioration in mental function caused by changes or damage to the brain tissues from lack of oxygen as a result of multiple blood clots through out the brain. Symptoms can range from amnesia, visuospatial deficits and aphasia from cortical lesions to memory impairment. The main aim of the present study is to draw attention of speech language pathologists, linguists and other professionals towards the nature of the language and cognitive deficits associated with MID and to profile the language deficits in MID. For this study, the authors had taken a subject who was diagnosed as having MID with onset prior to 6 months. The subject was assessed on Cognitive Linguistic Assessment Protocol in Kannada, Linguistic Profile Test in Kannada, Revised Token Test and Western Aphasia Battery in Kannada. The results were qualitatively and quantitatively analyzed and interpreted. The subject exhibited deficits like word finding difficulty, reduced mental abilities, and syntactic deficits, deficits in executing verbal commands like confusion of colors, sizes and objects. The present study revealed that patients with MID will have significant co-occurrence of language and cognition deficits. There is a greater need to identify them as soon as possible and the treatment should be started to slow down the further worsening of the disorder as there is no treatment that cures dementia. And also we should have more controlled studies to get to know about the language and cognitive deficits in patients with MID so that different treatment programs can be developed.

Area addressed: Brain and Language

Introduction

Dementia refers to an acquired syndrome characterized by persistent intellectual decline which is due to neurogenic causes. The nature and course of dementia will vary depending upon the etiology. Most dementias are progressive, but some are static and, contrary to widely held belief regarding the disorders, still others are reversible.

The Diagnostic and Statistical Manual states that the essential feature in dementia is impairment in short term and long term memory. This deficit in memory may be also associated with one or more of the following. (1) Impairment in abstract thinking, (2) Impaired judgment (3) Disturbances in higher cortical function, and (4) Personality changes.

The language disturbances in dementia long have been reported. Interest in the dementias has increased in the past decade resulting in more systematic description of the effects of dementia on communication should produce not only a more fundamental understanding

of the disorder, but improved avenues of management. Since dementing illnesses are associated with the elderly, the expectation and unavoidable conclusion is that the prevalence of dementia will increase.

Dementia can be caused by a variety of conditions: diseases, infections, or infarcts. The most commonly occurring cause is Alzheimer's disease accounting for 50 to 60% of all the patients with dementia. Vascular dementias (dementias caused by multiple infarcts) are seen in 20% of the dementia patients. Alzheimer's dementia and vascular dementia co-occur in approximately 15% of this sample, and other conditions such as Pick's disease, Parkinson's disease, progressive supranuclear palsy, and creutzfeldt-Jacob disease, account for the reminder of the irreversible dementias.

Multi Infarct Dementia (Vascular Dementia)

Multi-infarct dementia (MID) is the most common form of vascular dementia, which is a deterioration in mental function caused by strokes. "Multi-infarct" means that multiple areas in the brain have been injured due to a lack of blood.

MID affects approximately 4 out of 10,000 people. It is estimated that 10 - 20% of all dementias are caused by strokes, making MID the second most common cause of dementia in the elderly, behind Alzheimer's disease. MID affects men more than women. The disorder usually affects people over 55, with the average onset at age 65.

The symptoms of MID vary. Memory loss is often an early symptom of the disorder, followed by trouble making judgments. This often progresses to delirium, hallucinations, and thinking problems. Personality and mood changes can also occur. Lack of emotion and motivation, withdrawal, and extreme excitability (agitation) are common. Confusion that occurs frequently or is worse at night is another common symptom. Risk factors for MID include a history of stroke, hypertension, smoking, and atherosclerosis.

Symptoms

- Awareness of mental deterioration, which may cause frustration, depression, anxiety, stress, and tension.
- Dementia (slowly progressive memory loss) with lack of awareness of mental deterioration and:
    - Difficulties with attention, concentration, judgment, and behavior
    - Confusion, disorientation
    - Hallucinations (hearing sounds or seeing things which are not there) and delusions
    - Uncoordinated or weak movements
    - Aphasia (impaired language ability)
    - Personality changes
    - Progressive decreases in multiple brain functions
- Withdrawal from social interaction
    - Inability to interact in social or personal situations

    - Inability to maintain employment
- Decreased ability to function independently
- Decreased interest in daily living activities
- Lack of spontaneity
- Localized numbness or tingling
- Swallowing difficulty
- Sudden involuntary laughing or crying (emotional instability)

Stages of Progression

Identifying the course of dementia in stages or phrases has been found helpful in understanding the evolution of the condition. Reisberg (1974) has reported the course of dementia into seven clinical phases with corresponding global deterioration stages. The stages range from no cognitive decline to very severe decline. The clinical stages are characterized as normal, forgetful, confused and demented.

Early Dementia: in early dementia, the individual's behavior is characterized by moderate cognitive decline. Deficits may be noted during assessment of the mental status as well as in daily life. The patient may be disoriented to time and place and may be unable to recall personal information such address or telephone number. The person may need assistance in activities of daily living, such as getting dressed, etc… communication deficits are present and characterized by disjointed conversation that is reduced in its cohesion and information content.

Middle dementia: middle dementia is characterized by severe cognitive decline. The dementing individual may forget a spouse's name and be unaware of recent events. Knowledge of the remote past is better preserved but is impaired. More assistance is needed with daily living activities. Communication skills become increasingly impaired, and verbal output becomes less informative with frequent word finding problems. Personality and emotional changes are seen in this stage. These may include delusional behavior, such as talking to imaginary figures; obsessive symptoms, anxiety.

Late dementia: Very severe cognitive decline is seen in late dementia. In this stage, all verbal abilities are reported to be lost. Patients may be mute, perseverative, echolalic, or palilalic (with excessive reiterative utterances)

Diagnosis

The identification of moderate or severe dementia is relatively easy, as the deficits are marked. However difficulty exists in the diagnosis when dementia is mild and relatively early in its course. One diagnostic challenge is the differentiation of mild dementia and pseudodementia (a condition characterized by cognitive decline to depression). The diagnosis of dementia is based on clinical examination, CT scan, various laboratory tests, communication, and neuropsychological assessment. As in any condition, accuracy of diagnosis is crucial for appropriate management. Comprehensive evaluation is vital, and hasty conclusions must be avoided.

Method

Subject details

One subject with 50 years of age, who presented symptoms like memory problems, unclear speech and understanding verbal commands since 6 months was taken for the study. And the subject was diagnosed as Multi Infarct Dementia by Neurologist based on CT scan results. The subject was assessed on Western Aphasia Battery – Kannada (Kertesz, 1982), Cognitive – Linguistic Assessment Protocol for Adults in Kannada (Aruna Kamath, 2001), Linguistic Profile Test in Kannada (Karanth, 1980) and Revised Token Test in Kannada (Veena, 1982) to find out the language and cognitive abilities.

Results of Various Tests

1) Western Aphasia Battery in Kannada (WAB-K) (Kertesz, 1982).

On WAB-K, the subject showed problems like reduced MLU, slow rate of speech, problems in categorical naming, word finding difficulty in conversation and inadequate narrative abilities. The subject performed well in other tasks like auditory verbal comprehension, repetition.

2) Cognitive – Linguistic Assessment Protocol for Adults in Kannada (Aruna Kamath, 2001).

Table – 1: Results of subject on CLAP

S.No.	Domains	Subtasks	Total Score	Age Range
1.	Domain – I Attention, Discrimination, Perception.	Visual Subtest	Could not do as the subject is illiterate.	
		Auditory Subtest	14/30	> 65 to 70 years
2.	Domain – II Memory	Episodic	04/10	> 65 to 70 years
		Working	02/10	> 65 to 70 years
		Semantic	22/40	> 65 to 70 years

3.	Domain – III Problem Solving		35/60	> 65 to 70 years
4.	Domain – IV Organization		22/60	> 65 to 70 years

The subject's performance on this test is very poor. His cognitive and language abilities are deteriorated to the level of more than 65 to 70 years.

3) Linguistic Profile Test in Kannada (Karanth, 1980):

On LPT, the subject performed well in phonology and semantic tasks but had difficulty in syntax. Specifically subject had difficulty in tenses, case markers, sentence types, conjunctions, comparatives and conditional clauses. Overall, syntax comprehension was grossly affected with the patient unable to comprehend task requirements. This could be attributed to impaired metalinguistic judgment. In semantic tasks, subject performed poorly on sections like synonyms and homonyms.

4) Revised token test in Kannada (Veena, 1982):

On RTT, the authors mainly observed that as the complexity of stimulus increases, the subject's score is reducing. Subject could perform well in sections 1, 2, 3, 4 with repetitions of instructions. And from section 5 to 10, the subject exhibited difficulties like errors in executing verbal commands, substitution of colors wrongly in the second part of the commands. As the complexity increases, the subject's errors are increasing like difficulty even with sizes, object recall and comprehension of verbal commands even after repetition. Overall, the subject's syntactic comprehension was seen to reduce as the syntactic length and complexity increases.

From the above test results, it is very obvious that the subject had very poor cognitive and linguistic abilities. Even though, the subject realized that he had some problem with memory since 6 months, he did not give so much of importance to this problem due to reduced cognizance. But now the subject's condition is very poor. Based on this we can say that patients with MID will lose their cognitive and linguistic abilities so fast. As there is no cure for this, we can only stop the progress of the disease by giving more language stimulation and support and appropriate guidelines to family.

Conclusion

In the present study the main focus is on language (comprehension and expression) assessment of patients with MID. For this, the subject was assessed on WAB-K, CLAP-K, LPT-K, AND RTT-K. The subject showed deficits on memory tasks like episodic memory, working memory, semantic memory, problem solving and organization of

information. The syntactic comprehension (metalinguistic abilities), recognizing objects, shapes, colors were grossly affected.

World Health Organization says that India is going to have more number of dementia patients by 2020 as the old aged population is more in India by that time. So there is a greater need to find the therapeutic, medical treatments as soon as possible. Otherwise, there will be lot more problems because of this. At present, US is losing approximately $536 billion dollars per year because of dementia population. If this is the case with India, we are going to face more troubles in future. Further studies have to be carried out to find out the cognitive and linguistic deficits in patients with MID in detail in a periodic manner beginning soon after onset i.e., testing for each month or fortnight and along with guidance to self or caregivers can be undertaken. And more focus should focus on new treatment strategies and management options such as compensatory strategies with use of daily dairies and reminders for cases or caregivers with respect to language and memory aids like memory wallets, organizers would remind them of their schedules and communicative patterns. More needs to be worked upon management options of communicative language and disorders in dementia in Indian setup.

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