

15

WORD-RETRIEVAL AND COMMUNICATION DEFICIT IN DEMENTIA: A LONGITUDINAL STUDY

Swati Priya

Deepshikha Misra

INTRODUCTION

Dementia is the progressive decline in cognitive function due to damage or disease in the brain beyond what might be expected from the normal ageing. Dementia is not a disease. It is a medical term for a group of symptoms including:

1. Stroke
2. Parkinson's disease
3. Alzheimer's disease
4. Other causes like depression

In dementia, affected areas in cognition may be memory, attention, language and problem-solving. Higher mental functions are affected first in the process. Especially in the later stage of the condition "affected persons may face the problems in the orientation of time, place and person." (Cummings, et al.1985)

People suffering from dementia have progressive difficulty in accessing concepts and their linguistic representations generating meaning discourse and comprehending the meaning of words and contexts.

Anomia is the most common and earliest linguistic changes in dementia. (Bayles, et al.1992) In the mild stages, confrontation naming errors consists mainly in the

IJL (Interdisciplinary Journal of Linguistics) Vol(2), University of Kashmir.

production of super ordinate labels and semantic related attributes. (Bayles, Tomoeda, and Trossel 1990)

In the early stages of the problem, communication is already impaired; the patient may have the difficulty in mistaking conversation and in understanding humor, sarcasm, verbal analogies and indirect proposition. Anomia is the most striking trait associated with circumlocutions and rare verbal paraphasias. The phonetic, phonemic and syntactic aspects of language comprehension and, writing, show signs of impairment. Repetition and reading aloud are preserved. Some authors including Bayles, and Cooper (1985) and, Cummings (1988) identify this as 'anomic aphasia'.

In a more advanced stage semantic abilities are severely impaired with paucity of ideas leading to frequent repetitions, though phonetic and phonological stability is still evident. At the syntactic level speech production is fragmented. Anomia becomes even more frequent. Repetition and reading aloud are usually preserved. Therefore clinical profile is associated within sensory aphasia. (Bayles, 1985)

In the final stage of the problem, all linguistic functions are impaired with marked reductions in oral expression and severe problems of comprehension. (Cummings, 1988)

Language disturbances may occur as early symptoms in dementia and are characterized by poor performance in naming and verbal fluency tests. As the problem progresses, linguistic changes become more frequent and semantic problem predominate over syntactic and phonological problems. (Cordebat, et al.1991, Bayles 1994) Language changes in dementia include 'reduced verbal fluency in both free speech and normal speech' (Cummings, and Benson 1988).

The present paper is based on a longitudinal study of a bilingual person suffering from dementia. The subject selected for the study is a 76 years old male and a retired professional, who suffered from stroke which led to dementia and communication deficit. A language test was designed and conducted in 20 sittings over a period of 1 year at a regular interval of 15 days. The responses were recorded and noted down for further analysis. Due to various reasons including the subject's physical and mental health and the availability of time, some tests were not completed and had to be completed in more than one sitting, so the data presented in the study shows 12 tests only though the study refers to all the tests. The responses were marked and then presented in the form of tables and charts to show the subject's overall performance in all the test items and through the tests.

AIMS AND OBJECTIVES

The paper aims to present a longitudinal case study of a patient suffering from dementia to show the extent of communication deficit including anomia and problems in memory and word retrieval, which will further provide the input to prepare a graded linguistic profile of the subject based on the tests conducted at regular intervals to see the extent of language loss and pattern of recovery.

The study will also help to develop and standardize the language tests for bilingual dementia patients with a focus on word retrieval and naming difficulties in the same.

CASE STUDY: SOCIAL PROFILE OF THE SUBJECT

*Permission to conduct these tests was duly obtained from the subject/patient and was countersigned by his wife who is his guardian for all practical purposes.

- Name : Mr. Tilak Raj Sehgal
- Age & Sex : 70 / Male
- Education : B.Sc
- Occupation : Retired General Manager of a Tea Estate in Assam.
- Has a very good social life.
- Loves to play golf and chess.
- Has many friends and enjoys spending time with them.

The following details were taken from the case profile in the files of VIMHANS where he is being treated.

NEUROPSYCHOLOGICAL ASSESSMENT:

Date of testing: October, 14th, 2003

Test conducted at Cognitive Retaining Centre, VIMHANS, New Delhi.

TEST FINDINGS**FRONTAL LOBE**

No perseveration was noticed

No impairment was seen in ideational fluency

Moderate impairment on abstract thinking

Concrete thinking was intact

Severe impairment in working memory and kinetic melody

No changes in expressive speech

PARIETAL-OCCIPITAL LOBE

Visuo-perceptual functions showed no impairments.

Visuo-constructional ability and spatial relations showed moderate impairment.

Visual agnosia and anomia were present.

Apraxia and body schema disturbances were absent.

TEMPORAL LOBES

a) LEFT TEMPORAL LOBE

Verbal comprehension was intact.

Immediate memory for simple sentences was mildly impaired

Moderate impairment was seen in memory for complex verbal memory task.

Ability for new learning was present.

b) RIGHT TEMPORAL LOBE

Visual integration was adequate.

Visual learning and memory for simple task was moderately impaired.

Severe impairment was seen in visual complex memory.

IMPRESSION

Neuro-psychological assessment revealed global deficits.

The neurological deficits as a result of stroke as indicated in the medical reports in VIMHANS are reproduced below

CECT HEAD

POSTERIOR FOSSA

4th ventricle is normal in size, shape and position.

Brainstem and cerebral hemisphere are normal.

SUPRATENTORIAL

Brain parenchyma shows normal attenuation values.

3rd and lateral are generous sized with normal signal from within.

Septum is in midline.

Basal cisterns, fissures & cerebral sulci are prominent.

IMPRESSION

Diffuse cerebral cortical atrophy with hydrocephalus exvacuo.

TEST PROCEDURES AND TEST INSTRUMENTS

The whole test is divided into *10 units*, and every unit carries a score of 10 marks .The Units of the tests are discussed below

1. COMPREHENSION

Test Unit one consists of comprehension, in which the questions related to the subject's daily habits and routines were asked. Sometimes three line stories were narrated to the subject and he was supposed to answer the questions related to the stories. The test unit focused on the word, phrase and sentence comprehension, hence keeping in view the questions that were selected. The types of the questions asked to the subject included 'when did the subject has his breakfast, what is the color of his vehicle, when did he go to sleep'. At the end of the test, the patient was asked, what the first test was about that was conducted that day. The test unit consists of 10 marks.

2. READING

Test Unit two consisted of the questions to test the subject's reading ability. A set of four to five sentences were presented to the subject, and he had to read those sentences. The sentences mostly consisted of the expansion of nouns and verbs. A noun or a verb was given in the first line and it expanded in the rest of the lines, like the following:

'The Commander,

The Commander gives order,

The Commander gives marching order,

The Commander gives marching order to the army'.

The subject was presented with these sets of sentences and asked to answer some of the questions like following

'Who gives the order?

The commander gives the order to whom?'

The test unit consists of 10 marks and the marks are equally distributed among the sentences and the questions.

3. NAMING

Our main investigation is to find out the anomic tendencies of the subject, so we put a lot of emphasis in this test item. Lots of words falling in the various categories of verbs and nouns were selected like the names of fruits, vegetables, names of the days and months, food items that the subject like and dislike and the names of the objects present in the room. Sometimes with the help of charts and cards the subject was asked to name the object. This test unit consisted of 10 marks and the marks were given for prompt answers and those without prompting.

4. CALCULATIONS

The test items consisted of addition, subtraction, multiplication and division. In the initial stage we took only single digit numbers but later on we included the double digit numbers as well. In addition carry-over sums were also included to judge the subject's command over numbers.

5. FLUENCY TEST

The test item consisted of the words falling in the category of consonant clusters. Some of the words of tongue twisters like "railway station, scrabble, scratch, encroachment" were selected to test the subject's ability in pronouncing these words. This test unit also consisted of 10 marks.

6. DISCOURSE ABILITIES

The test unit no. six consisted of the questions related to the subject's daily activities, his habits, interests, about his family members and the questions related to the time, place and date. We also tried to include the questions related to his past like asking about his job and when he got married, when his first son was born and any other questions that he was interested in talking about. The whole test unit consisted of 10 marks.

7. LEXICAL ITEM 1

The test item consisted of the questions related to find the missing items including the numbers and letters. The subject was presented with the set of words or numbers like 34, 35, 36, ----, 38, and the subject was asked to fill the gap. In the similar way names of months and days were given and he was supposed to find out the missing items. The whole test was divided into four to five subparts and marks were equally distributed.

8. LEXICAL ITEM 2

The test unit eight consisted of the questions falling in the categories of specific-generic. A set of ten fruits five vegetables and seven flowers are given and the subject had to put all the items in their specific categories. In the similar way the names of months are mixed with the names of the days and the subject had to separate the categories. This test unit also consisted of 10 marks.

9. LEXICAL ITEM 3

Questions consisted of finding the odd one, were included in this test item, consisting of both numbers and alphabets. Lists of items including five vegetables and one fruit were given to the subject and he was asked to find out the odd ones. In the similar way sometimes we used to give the names of the months and days and he had to find out the odd ones out. The whole test unit consisted of 10 marks.

10. LEXICAL ITEM 4

This test item includes the questions related to the praxic movements and to find out the left-right orientation of the subject. The subject was asked to point out the names of the directions in this test unit like where is the door in this room, in which hand you are wearing your watch, like this the questions were asked and marks were given for prompted and unprompted answers.

SCORING PATTERN

The duration of the test was around 1.5 hours which depended upon the subject's physical and the mental condition. The test consisted of 100 marks with 10 marks for each unit

Two (2) marks were given for the right answer without prompting

One (1) mark for prompted answer

Zero (0) mark for no answer

Performance of the subject in all the tests is discussed in the following section.

LANGUAGE ITEMS	T1	T2	T3	T4	T5	T6	T7	T8	T9	T10	T11	T12	Total: 120
READING	6	5	4	6	4	4	4	6	6	6	5	6	62
COMPREHENSION	4	3	3	2	2	2	1	3	2	6	2	2	28
DISCOURSE ABILITIES	2	3	2	5	6	2	2	3	3	2	1	4	35
FLUENCY TEST	4	6	7	4	6	5	4	6	5	6	5	4	62
LEXICAL TEST 1	7	4	2	6	5	2	6	4	5	4	6	6	57
LEXICAL TEST 2	0	0	2	1	0	0	1	1	0	1	2	1	9
CALCULATION	6	7	5	6	7	5	6	8	6	7	7	6	76
LEXICAL TEST 3	2	3	1	2	1	2	1	2	3	2	3	3	25
LEXICAL TEST 4	2	1	2	0	0	1	0	1	1	2	2	2	13
NAMING	0	1	2	1	2	0	1	2	1	1	1	3	15
TOTAL MARKS OF TEST WISE	33	33	30	33	33	23	26	36	32	37	34	37	382

Figure I

PERFORMANCE OF THE SUBJECT IN ALL THE 12 TESTS CONDUCTED IN ALL THE TEST UNITS (T1-----T12)

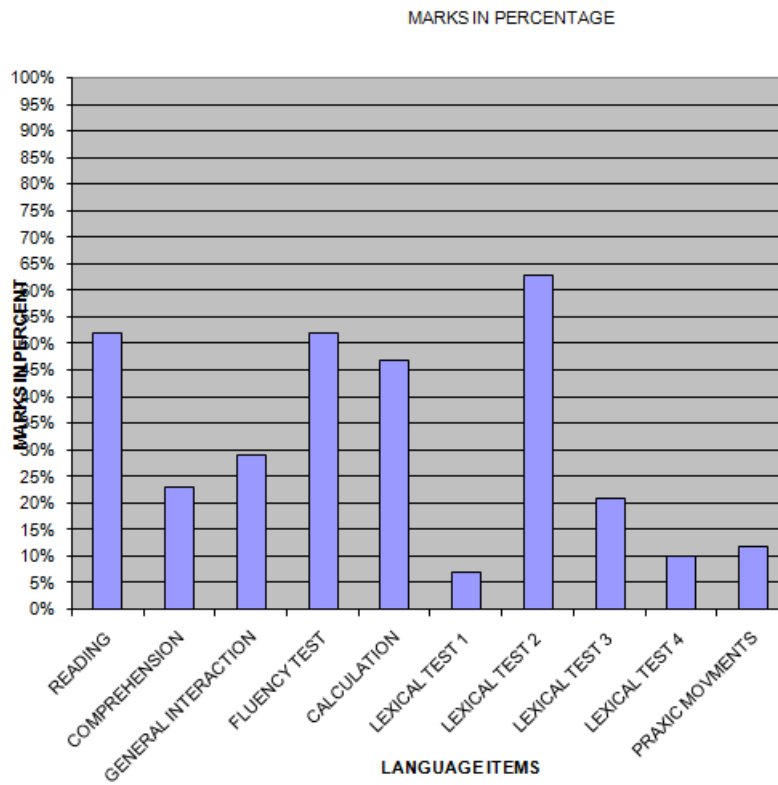


Figure II

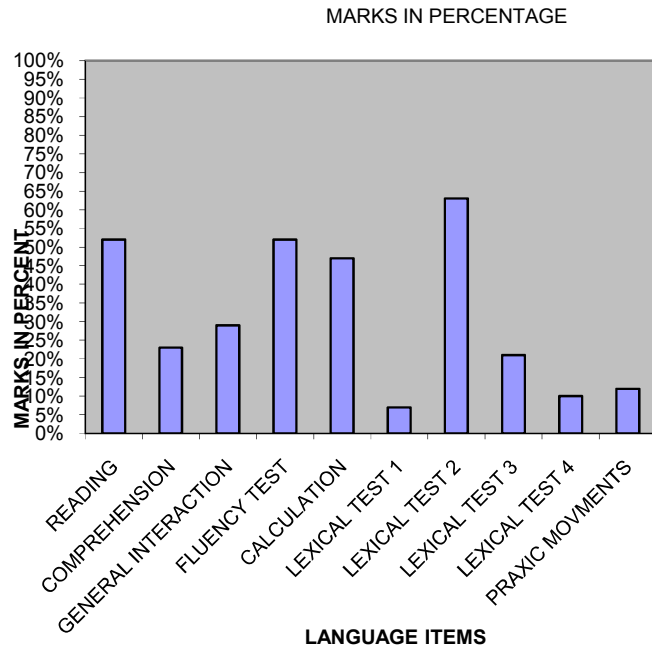


Figure II

Figure showing the subject's performance in all the test items

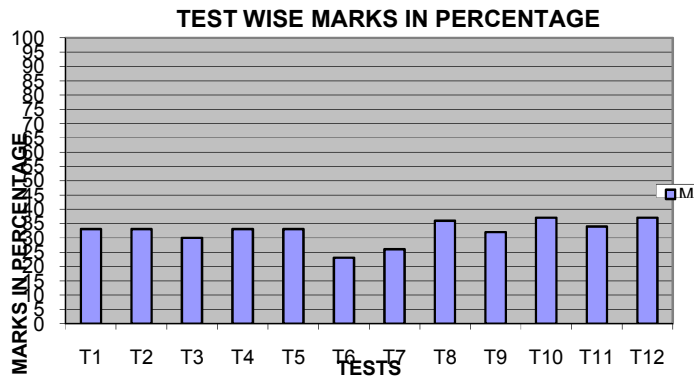


Figure III

Graph showing the subject's overall score and performance in all the twelve tests

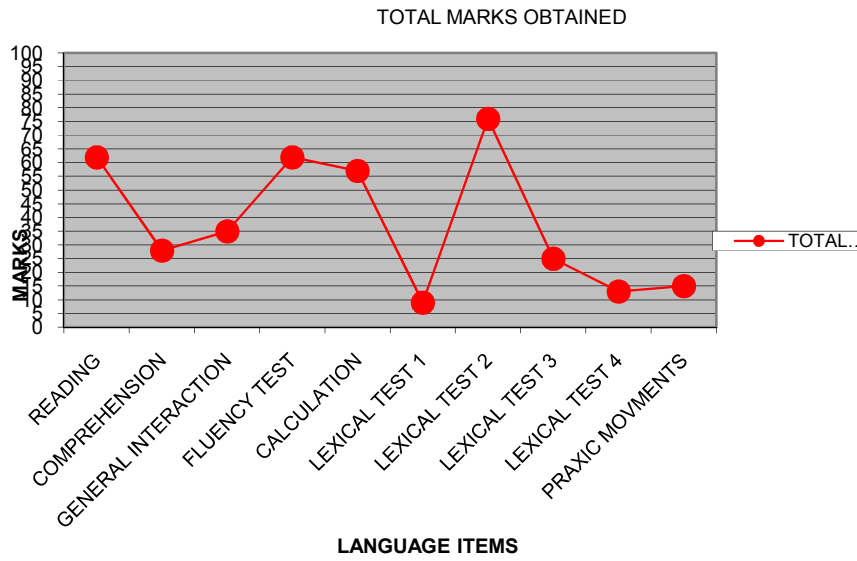


Figure IV

Graph showing the total marks obtained by the subject in all the 12 tests and in all the 10 test items

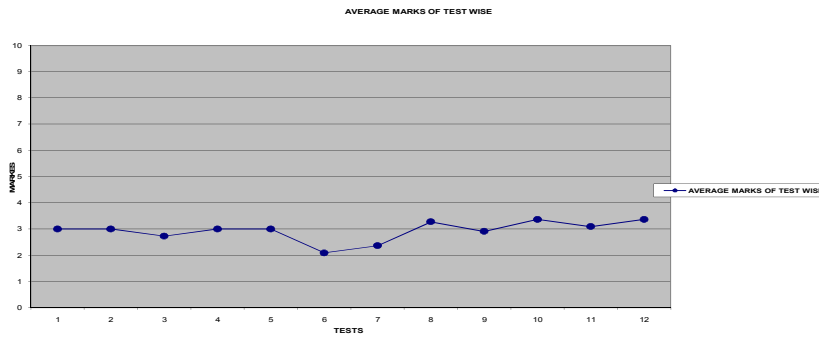


Figure V

Graph presenting the average marks of the subject in all the twelve tests

The above graph clearly shows that the average marks the subject has remained between 30-35%. This average does not reveal anything about the subject's language deficit. So *individual test items* are examined separately in the following section

INDIVIDUAL TEST ITEMS

1. READING

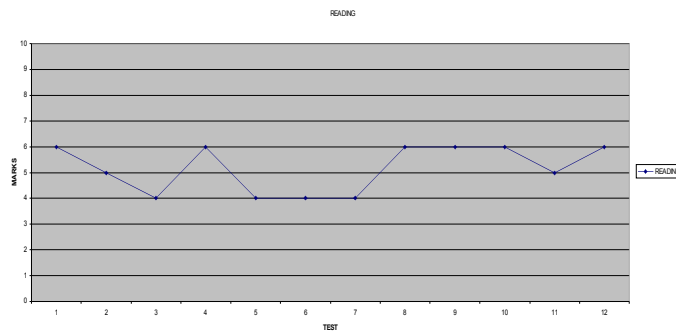


FIGURE VI

The subject's reading ability is intact hence he has shown relatively good performance in reading. The overall reading score remains between 40-60% in all the tests.

2. COMPREHENSION

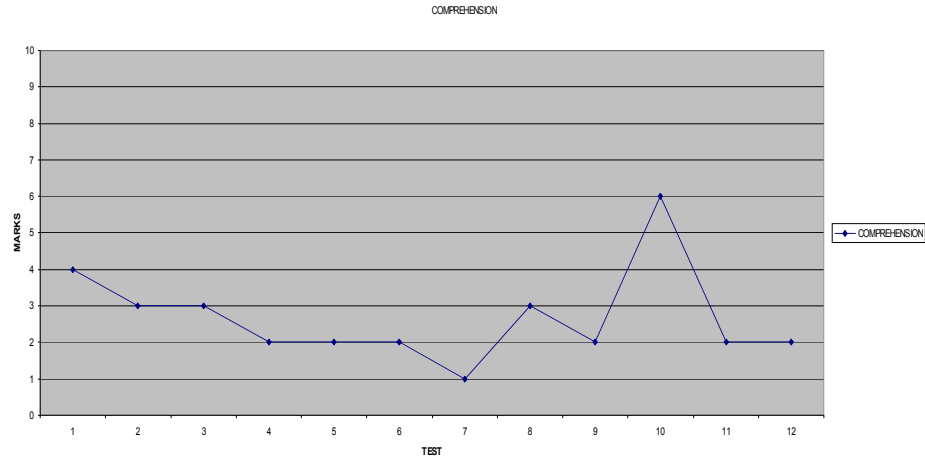


FIGURE VII

The main area of the problem is related to comprehension hence the result is poor. The subject can read properly but his comprehensive ability is very poor. The overall score remains below average i.e. 20-30% in all the tests.

3. GENERAL INTERACTION

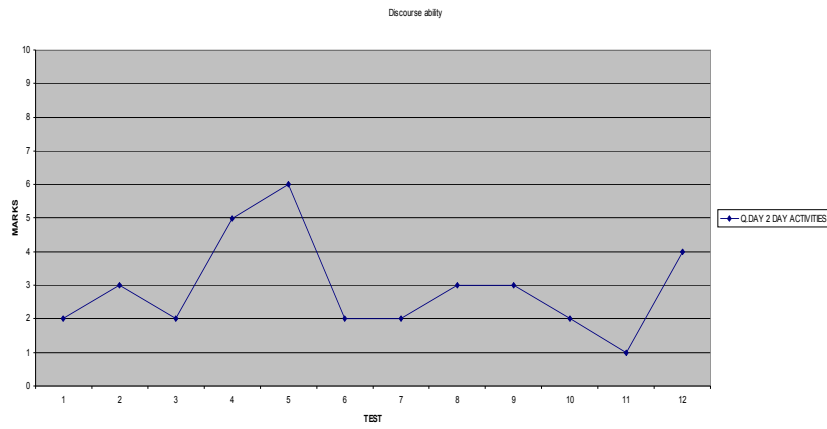


FIGURE VIII

The results in this test item are not uniform. In almost all the test except two, the subject's performance remains below average, between 10-30%.

4. FLUENCY TEST

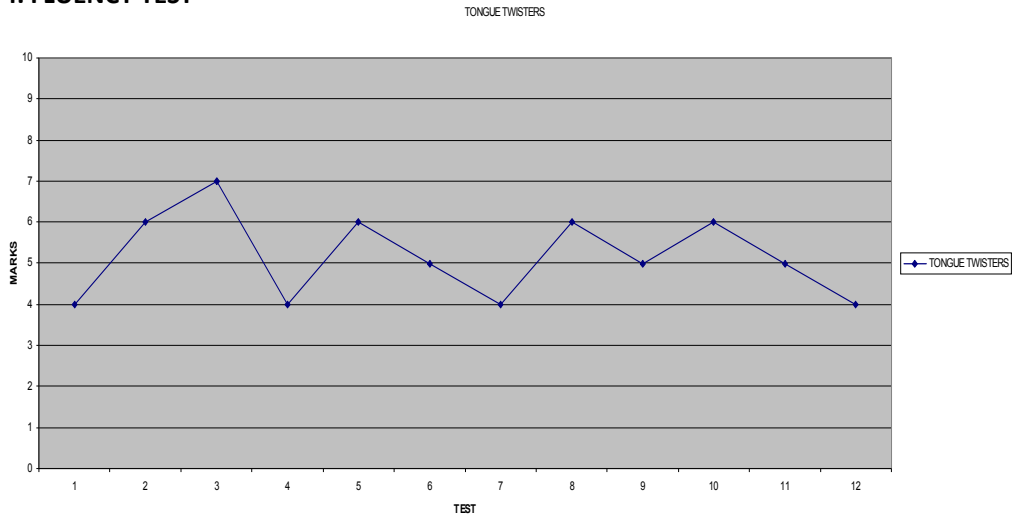
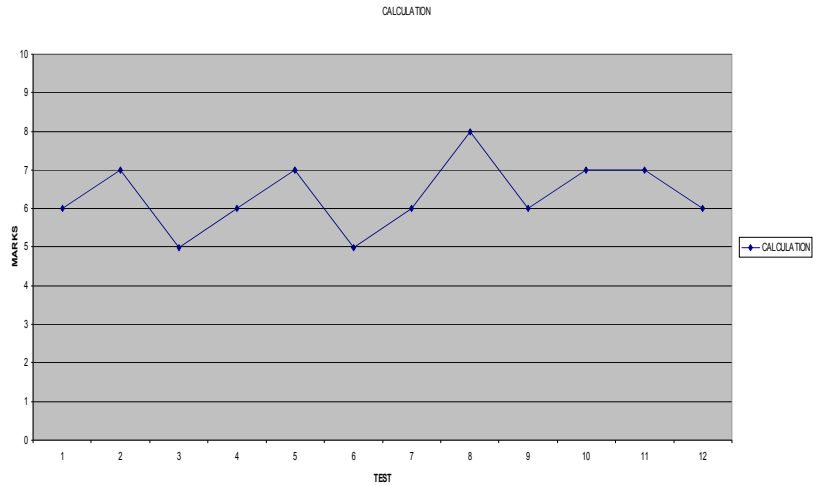


FIGURE IX

This test item included the words of consonant clusters. The subject's reading ability is intact so he has performed comparatively well in this test item. His overall score remains between 40-60% which is better than the other test items.

5. CALCULATION



The Subject has a good command over numbers so he has performed well in this test item. In all the tests the subject's score remain between 60-70%.

6. NAMING

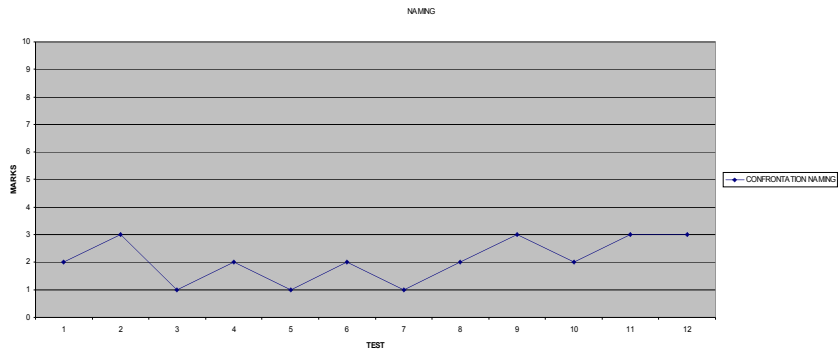


FIGURE XI

Since naming is the main area of the problem hence the subject's result is very poor in this test item. In almost all the tests the result is very poor and his overall score remains between 10-20% which is below the average.

7. LEXICAL TEST 1

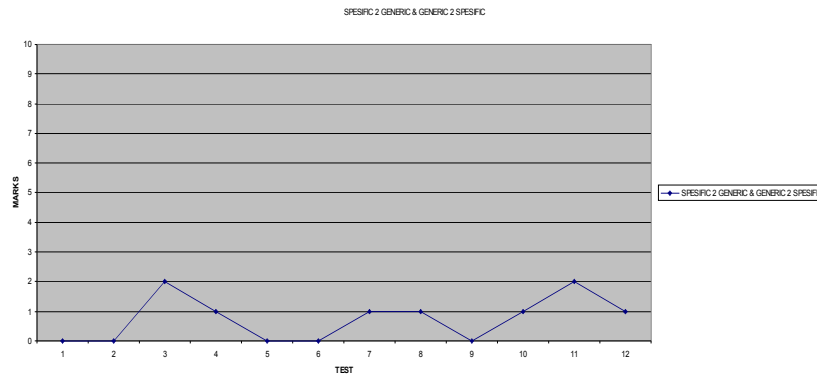


FIGURE XII

The subject performance in this test item remains poor as this is the main area of the problem. The overall score is below average between 10-20 % in all the tests.

8. LEXICAL TEST 2

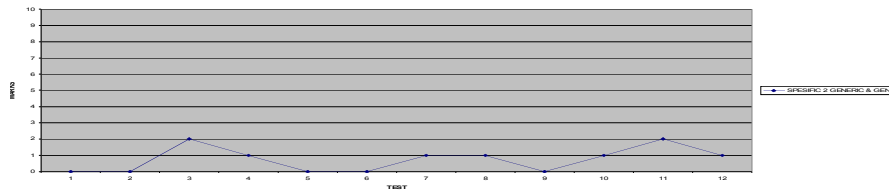


FIGURE XIII

The subject has performed very poorly in this test and he has not even achieved the average marks in any of the tests. The score remains low throughout between 0-10 % except in only two tests where he was physically and men tally fit and he was answering all the questions.

9. LEXICAL TEST

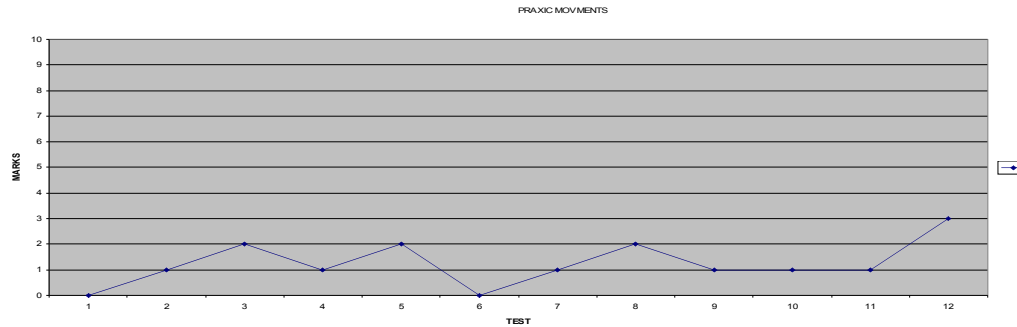


FIGURE XIV

In this test item the subject has performed very poorly. The score has remained between 0-20 percent which is below the average marks.

10. LEXICAL

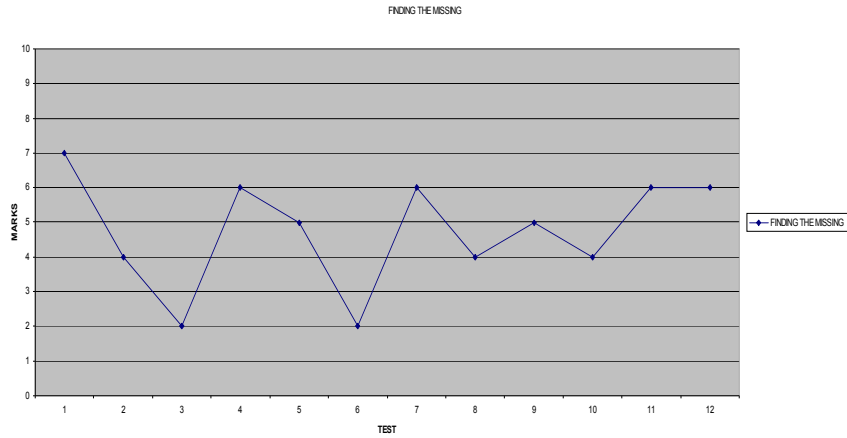


FIGURE XV

In this test item the subject has performed comparatively well. He has even scored 70% in one of the tests which is above the average marks. Overall the score remains between 30-60%.

RESULT AND CONCLUSION

The graphs clearly shows that the subject's linguistic ability is severely impaired .After examining the subject and conducting the tests for 1 year the results indicate that the major affected area is related to naming ,comprehension and word retrieving ability. The subject has shown very poor results in *comprehension, naming, lexical test-1, lexical test -3 and lexical test-4*. In all these tests the subject has scored below averages and the marks remained between 10-20 %.These are the main focal areas which are majorly affected in the subject and need to be focused upon.

Apart from these the subject has performed comparatively well in reading, calculation and fluency test, though in the calculation the subject has not given good result with double digit numbers but overall his performance is good. Even though in

all the three tests, the subject has not scored more than 70 % in all the tests, so these areas should also be looked upon.

ACKNOWLEDGEMENT

We gratefully acknowledge the guidance and help we received from Prof. Vaishna Narang, JNU in conducting this study.

REFERENCES

Bayles K. A. and, C. K. Tomoeda. 1985. "A View or Age Related Changes in Language Function". *Dev Neuropsychol*.

Bayles, K. A. 1987. *Communication and Cognition in Normal Ageing and Dementia*. Canyonlands Publishing.

Brigitte, Stemmer and, A. W. Harry. 1998. *Handbook of Neurolinguistics*. Academic Press Ltd.

Cummings, J. L. 1988. *The Dementia of the Alzheimer's Type: Challenges of Definitions and Clinical Diagnosis*. Eur ,Neurol.

Elizabeth, A. 2006. *Introduction to Neurolinguistics*. Amsterdam: John Benjamins

Garg, K., M. Kaul and, I. Bahl. 2006. *Text book of Neuroanatomy*. New Delhi: CBS Publishers

Howard, S.K. 1995. *Handbook of Neurological Speech and Language Disorders*. New York: Marcel Dekker Inc.

Longstaff, A. 2002. *Instant Note Neuroscience*. New Delhi: Viva Books Private Ltd

Obler, L.K. 1980. *Language and Communication in the Elderly*. Lexington, MA: DC Heath.

Whitaker, H.A. 1976. "A Case of Isolation of the Language Function". H. Whitaker. (ed.). *Studies in Neurolinguistics*. 2. New York: Academic Press.