

Memory Dysfunctions in the cases with Schizophrenia

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ABSTRACT

Background: Memory refers to the process by which information is stored in the brain. It includes encoding, storage and recall of information. Memory encapsulates sense of personal identity, culture and the meaning of individuals' life. Schizophrenia patients consistently show performance deficits on memory tasks, whether the material in question is verbal or nonverbal, recently learned items or older material. *Aim:* The study has been designed to assess the memory deficits in schizophrenic patients and its comparison with the normal control group. *Method:* The sample consists of 100 subjects, out of which 50 schizophrenia patients diagnosed as per ICD-10 DCR criteria and 50 normal control subjects have been included in the study. Wechsler Memory Scale and GHQ-12 have been used in the study. *Result:* Schizophrenia patients performed poor in comparison to normal control subjects on subtests of Wechsler Memory Scale. It has further been found that schizophrenic patients were having problems of immediate, recent and remote memory. They were having impaired logical memory in terms of conceptualizing themes of the story and had difficulty in learning and remembering the information. *Conclusion:* Patients with schizophrenia exhibited impaired information and orientation, disturbed logical memory and had problems in conceptualizing the themes.

Key words : Memory Impairment, Schizophrenia,

INTRODUCTION

Schizophrenia is the most severe mental illnesses characterized by delusions hallucinations, disorganized speech of frequent derailment or incoherence and grossly disorganized behaviour. The deficient processes involved in this disorder are clinically silent until the onset of prodromal or psychotic symptoms, at which time neuropsychological testing demonstrates the presence of cognitive deficits that are often chronic and apparently irreversible (Goldberg et al., 1993). The clinical picture of schizophrenia has led many authors to speculate that particularly the negative features of schizophrenia reflect deficits in executive functioning (Anderesen et al., 1989).

Memory refers to the process of encoding, storage and recall of information. Encoding allows the perceived item of interest to be converted into a construct, storage referring processes of retaining information in the brain and recall or retrieval is the process of re-accessing of events or information from the past, which have been previously encoded and stored in the brain (Klatzky, 1980; Howard, 1983).

Memory deficits observed in schizophrenia are not restricted to a single element of memory but strike

different systems, such as declarative memory, procedural memory and working memory. McKenna et al., (1990) and Tamlyn et al., (1992) also reported significant memory deficits in the group of schizophrenia. (Aleman, et. al., 1990) have observed deficiency in memory while examining schizophrenic patients. Schizophrenia patients exhibited impaired memory (Goldberg et al., 1988; Goldberg et al., 1989; Saykin et al., 1994)., deficits in recent and remote memory has also been observed by McKenna et al., (1990). Schwartz et al., (1991) have shown that among schizophrenics there is a disturbance of the temporal ordering of information, suggesting a possible disturbance of episodic memory.

The present study has been undertaken with the aim to assess the memory deficits in schizophrenia patients as compared to normal control subjects by using information orientation and logical memory subtests of Wechsler Memory Scale-III.

MATERIAL AND METHOD

The sample consisted of 100 subjects, out of which 50 were schizophrenia patients diagnosed as per ICD-10 DCR criteria from different inpatient and outpatient department of Ranchi Institute of Neuro Psychiatry and Allied Sciences, Ranchi and 50 were normal control

subjects. Both male and female participants were included in each group i.e., schizophrenia and normal control subjects. Positive and Negative Syndrome Scale (PANSS) was administered individually to assess the psychopathology of schizophrenia patients. For normal control group GHQ-12 (Goldberg & Miller, 1979) was used to assess any psychiatric problem and subjects having cut off score more than 2 were excluded. Afterwards Wechsler Memory Scale III (Wechsler, 1997) was administered on both the groups to assess the memory dysfunction.

RESULTS

Obtained data has been analyzed by mean, standard deviation and Mann Whitney U test for the comparison of schizophrenia patients and normal control subjects on WMS-III scale.

Table - 1 showing the Performance of Schizophrenia Patients and Normal Control Subjects on Information and Orientation domain of WMS-III.

Subjects Subtests of WMS-III	Schizophrenia Patients (N=50)		Normal Controls (N=50)		Mann Whitney U Test	
	Mean	SD	Mean	SD	U value	Z score
Information & Orientation-I Total Recall	61.10	11.13	72.88	9.75	547.00	4.84**

**** Significant at 0.01 level.**

Table-1 shows the performance of schizophrenia patients and normal control subjects on information and orientation subtest of WMS-III. It has been found that schizophrenia patients had poor information and orientation in comparison to normal control subjects and difference was significant at 0.01 level (Schiz: M= 61.10 ± 11.13, Normals: M=72.88 ± 9.75, U = 547, P = 0.01). Further it has found that majority of schizophrenia patients were unable to give information regarding existing and previous prime ministers and chief ministers, had problems of telling months, day of the month, unable to tell place and city. Some of the schizophrenia patients were unable to even tell the days of the week, not having orientation of time and place in comparison to normal control subjects.

Performance of schizophrenia patients and normal control subjects on logical memory subtests of WMS-III has been given in table-2. It has been observed that schizophrenia patients performed significantly poor on logical memory-I (Schiz: M=9.64 ± 4.10. Normal controls: M=13.92 ± 3.48, U value=524.50, Z score=5.012, p = 0.01) indicating inability to recall the stories as well themes of the stories in

the group schizophrenic patients. Similar trend of impairment has been observed in this group while assessing the thematic memory (Schiz: M=8.10±3.63, Normal Controls: M=14.04 ± 2.94, U value=735.00, Z score=3.57, p = 0.01). **Table-2: Showing the Performance of Schizophrenia Patients and Normal Control Subjects on Logical Memory domain of WMS-III.**

Subjects Subtests of WMS-III	Schizophrenia Patients (N=50)		Normal Controls (N=50)		Mann Whitney U Test	
	Mean	SD	Mean	SD	U Value	Z score
Logical Memory-I: recall total Scaled score	9.64	4.10	13.92	3.48	524.50	5.012**
Logical Memory-I thematic total scaled scores	8.10	3.63	14.04	2.94	735.00	3.57**
Logical Memory-II recall total scaled scores	7.40	4.17	13.72	2.79	189.00	7.34**
Logical Memory-II Thematic total scaled scores	6.58	3.13	11.46	2.23	242.00	7.00 **
Logical Memory-II % retention	7.36	2.20	11.70	2.95	630.50	4.18**

**** Significant at 0.01 level.**

When schizophrenic patients were assessed on logical memory II of Wechsler memory scale, it has been found that schizophrenic patients performed poorly as compared to normal control subjects and difference between these two groups has been found to be significant at 0.01 level (Schiz=7.40±4.17, Normal Controls =13.72±2.79, U values=189.00, Z score=7.34, p = 0.01).

It has further been visualized that schizophrenic patients performed poorly on logical memory II and thematic total scores of schizophrenia patient's M=6.58 ± 3.13 and normal control subject's M=11.46 ± 2.23, U value are=242.00 and difference were at 0.01 level, and logical memory II % retention of schizophrenic patient's M=7.36±2.20 and normal control group's M=11.70±2.95 and its U value are=630.50 and difference were significant at 0.01 level respectively, which indicating that schizophrenia patients performed significantly worse than normal control subjects on logical memory subtest. And they were having problem in conceptualizing theme of the story.

DISCUSSION

In this study an assessment of memory dysfunction of schizophrenia patients have been done along with its comparison with normal control individuals. The

obtained results demonstrate significant deficits in the group of schizophrenia patients as compared to normal controls in memory as assessed by Wechsler Memory Scale- III (Table-I) Similar results were found by Ravindran & Rangaswamy (2004) who conducted a study on schizophrenia patients with normal control group in the domain of memory and found that former have difficulty in learning and remembering new information. In logical memory I and logical memory II schizophrenic patients performed poorly which indicates poor performance by most of the patients (Table-II). Item interpretation shows that most of the schizophrenic patients have impairment in ability to remember information immediately after it is orally presented. Percent retention scores also poorer than normal control subjects of schizophrenic patients which indicated that they are unable to sustain the information after 25-30 minutes. Result is consistent with previous research findings. McDonald, et al, (2006) tested episodic memory using logical memory and visual reproduction tasks of the Wechsler Memory Scale (Revised) and observed marked verbal recall deficits in schizophrenic patients compared to normal controls. Similar findings were obtained by Goldberg et al (2008) observed that schizophrenic patients were having impairment in verbal learning and auditory delayed memory. Michael. et al, (2011) have done a study on 65 schizophrenic patients and 45 healthy normal subjects using verbal paired lists and word list tests, and their results revealed that schizophrenic patients had significant deficits than that of normal subjects on both memory tests..

CONCLUSIONPatients with schizophrenia exhibited impaired information and orientation, disturbed logical memory and had problems in conceptualizing the themes. Recall performances showed impaired in schizophrenic patients on information orientation and logical memory subtest of WMS III as compared to normal control subjects.

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