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Attention and Working Memory in among Remitted Patients of Depression and their comparison with Healthy Control

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ABSTRACT:-

BACKGROUND: - MDD is the most prevalent among all mental disorders with a life time prevalence of around 13.5-21.2%. And at any time, at least 5% of population suffers from depression. It is also accompanied by cognitive deficits which will contribute significantly to poor functional outcome that leads to reduced health-related quality of life.

METHODOLODY:- This is a comparative cross sectional study. The study participants (50)were taken from department of psychiatry .Dr S N Medical college Jodhpur, Rajasthan after applying exclusion and inclusion criterias.Participant with Subjects meeting the remission criteria of MDD (HAM-D Score less than 7 was subjected Digit Forward Test for attention, Digit Backward Test for memory control (50)were taken from hospital staff or bystanders in hospital. The same set of tests was applied to Healthy Controls (HC).

RESULT:-The most of the patients studied (n = 17) in the age range of 41-50 years, followed by (n = 15) in the age range of 31-40 years. Similar pattern was observed in control, maximum number of the cases were found (19) 38% in the age of 31-40 years.The mean of HAMD score was significantly higher in cases as compared to controls 4.54±0.93vs 1.60±0.70 respectively (P= 0.001S). Study cases could repeata mean of 5 numbers indigit forward test, in healthy control mean was 6. And hence, there was no much impairment in attention and vigilance. Cases performed well indig it forward section, but there was poor performance in digit backward section as compared to control. And hence it was inferred that there was impairment in working memory in cases.

Keywords:- Depression, Working Memory ,Attention, Remission

I. INTRODUCTION

Major Depressive Disorder (MDD) is the most common psychiatric condition with high rates of chronicity, recurrence, leading to staggering economic burden, causing disability in the work force. [1] MDD was the second leading cause of burden globally in 2010, with the highest estimates of disability among working age people.[2] At current scenario,Over 300 million people worldwide suffer from depression, accounting for about 4.4% of the world's population [3] MDD is the most prevalent among all mental disorders with a life time prevalence of around 13.5-21.2%.[4] And at any time, at least 5% of population suffers from depression.[5]It is also accompanied by cognitive deficits which will contribute significantly to poor functional outcome that leads to reduced health-related quality of life. . Although, mood symptoms and vegetative functions are the core symptoms in depression, cognitive symptoms also have been described which significantly contributes to functional impairment.[6]Cognitive complaints are also the core symptoms in acute episodes and it impacts the day to day functioning of the individual. Cognitive dysfunction refers to deficits in attention, working memory, speed of processing, reasoning and problem solving, verbal learning. There is a clear association between improvement in depressive symptoms and improved cognitive functioning. In MDD, cognitive dysfunction may be used primary mediator of functional impairment.[7]Here in our study we are going to attention and working memory in among Remitted patients of depression and their comparison with healthy control in the two domain of cognition namely memory and the attention.

II. AIM AND OBJECTIVES:-

2.1AIM:-

This study is aimed to access attention and working memory deficient in remitted phase of major

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depressive disorder in our hospital and to compare with healthy control.

2.2 OBJECTIVES:-
To assess the attention and working memory in subjects with remitted phase of MDD.

III. MATERIAL AND METHODS

Study Design: Cross sectional observational study
Place of study: Department of Psychiatry Dr. S.N. Medical College and allied Hospitals, Jodhpur, Rajasthan.
Source of data: Patients attending Department of Psychiatry at Dr. S.N. Medical College and Hospitals, Jodhpur fulfilling the diagnostic criteria for MDD under remission as per Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5).
Study Duration: 6Months

Criteria:-
Inclusion Criteria:
We included the Participants who met the following criteria:
1. Those who fulfilled **DSM-5** criteria for MDD and currently under remission. Remission with Hamilton Depression Rating Scale (HAMD) less than 7]
2. Aged 18-55 years.
3. Minimum 10th standard education
4. Those who give voluntary written informed consent.

Exclusion Criteria:

1. Subjects with other major psychiatric disorders.
2. Hyperthyroidism or hypothyroidism.
3. Receiving electroconvulsive therapy or repeated trans-cranial magnetic stimulation.
4. Women who were pregnant, less than 6 months post-childbirth, or lactating.
5. Experiencing severe suicidal tendencies

Control group:
Inclusion criteria:
1. Age 18-55 years
2. Minimum 10th standard education
3. Who give voluntary written informed consent
4. Absence of MDD and other major psychiatric diagnosis during lifetime

Exclusion Criteria:-
1. Medical conditions affecting cognitive functioning in recent past
2. Substance abuse disorders

Research tools used for the study: -
1. DSM-5 criteria for diagnosis of MDD under remission
2. Semi-structured Performa to collect data regarding socio-demographic profile and history regarding illness - both patient and reliable informant were interviewed to obtain the history.
3. **Hamilton Depression Rating Scale**[8]
HAM-D scale is the most widely used depression severity rating scale in the world. Max Hamilton published it in 1960 and was designed to measure severity of depression in previously diagnosed depressed inpatients.

4. Assessment of Attention and Working Memory:-

1.	Attention / Vigilance	1.	Digit Span Test – Forward
2.	Working Memory	2.	Digit Span Test – Backward

Digit Span Test

This test is from the Wechsler adult intelligence scale (Wechsler 1981). It has two parts - digit forward test and Digit backward test.

In **digit forward** test the subject is asked to repeat the digits called by examiner. The maximum number of digits correctly repeated is the score. It measures short term memory, attention and concentration.
In **digit backward** test the subject is asked to repeat the digits read out by the examiner backward. For example, if the examiner reads 4965, the subject has to say 5694. The maximum number of digits repeated back and correctly is the score on this test. It measure verbal working memory.
Total score for the Digit Span Test is the sum of the scores on digit forward and digit backward test.

METHOD:-

The patients who came to Psychiatry OPD, fulfilling inclusion and exclusion criteria were considered. Cases (50)were be provisionally selected by consultant psychiatrist available in the department .After obtaining Informed consent, demographic information of subjects was collected. To confirm the remission phase of MDD, HAM-D was applied to subjects by the principal investigator. Subjects meeting the remission criteria

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of MDD (HAM-D Score less than 7 was subjected Digit Forward Test, Digit Backward Test control (50) were taken from hospital staff or bystanders in hospital. The same two set of tests was applied to Healthy Controls (HC).

Methods of statistical analysis: - Statistical analysis was done through SPSS software version 23. Continuous Variables was analysed with t-test and discrete variables were analysed with use of Chi-Square test.

IV. RESULTS:-

4.1: Distribution of the subjects according to age groups

Age	**Case**		**control**		**Grand Total**		**P-values LS**
	No	**%**	**No**	**%**	**No**	**%**	
≤20	1	2	2	4	3	3	0.139NS
21-30	5	10	12	24	17	17	
31-40	15	30	19	38	34	34	
41-50	17	34	9	18	26	26	
>50	12	24	8	16	20	20	
Grand Total	**50**	100	**50**	100	**100**	100	
Mean±SD	**42.22±9.29**		**39.68±8.48**		**41.45±9.63**		0.205NS

Chi-square = 6.948 with 4 degrees of freedom; P = 0.139

4.2 .Distribution of cases according to Sex

Sex	**case**		**control**		
	No	**%**	**No**	**%**	**P-values LS**
Male	41	82	36	72	0.342NS
Female	9	18	14	28	
Grand Total	**50**	100	**50**	100	

Chi-square = 0.903 with 1 degree of freedom; P = 0.342

4.3. Distribution of cases according to education

Education	**case**		**control**		
	No	**%**	**No**	**%**	**P-values LS**
10^{th}	8	16	4	8	0.45NS
12^{th}	13	26	13	26	
Graduate/P.G.	29	58	33	66	
Grand Total	**50**	100	**50**	100	

Chi-square = 1.591 with 2 degrees of freedom; P = 0.451

4.4. Distribution of cases according to HAMD score

HAMD score	**case**		**control**		
	No	**%**	**No**	**%**	**P-values LS**
1	0	0	26	52	<0.001S
2	0	0	18	36	
3	8	16	6	12	
4	14	28	0	0	
5	21	42	0	0	
6	7	14	0	0	
Grand Total	**50**	100	**50**	100	
Mean±SD	**4.54±0.93**		**1.60±0.70**		<0.001S

Chi-square = 86.286 with 5 degrees of freedom; P = 0.000

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4.5. Comparisonof DST F AND DST –B between the groups

DST-F	**case**		**control**		
	No	**%**	**No**	**%**	**P-values LS**
4	29	58	0	0	
5	21	42	4	8	
6	0	0	38	76	
7	0	0	8	16	<0.001S
Mean±SD	4.42±0.50		6.08±0.49		
DST-B					
2	5	10	0	0	
3	42	84	0	0	
4	3	6	25	50	
5	0	0	24	48	
6	0	0	1	2	<0.001S
Grand Total	**50**	100	**50**	100	
Mean±SD	**2.96±0.40**		**4.52±0.54**		

V. DISCUSSION:-

We have recruited individuals above 18years only for the study. The most of the patients studied (n = 17) in the age range of 41-50 years, followed by (n = 15) in the age range of 31-40 years. Similar pattern was observed in control, maximum number of the cases were found (19) 38% in the age of 31-40 years , followed by (12) 24% in the age of 21-30.

The Mean scoring of age in case was 42.22±9.29 years and that of group control was 39.68±8.48 years, with a P value of 0.139 which is non-significant, indicating that the groups were comparable according to age. Males accounted for 82% of **cases**, while 72% were in the **control group**. Also there were 18% females in the case group and 28% females in the control group. Upon comparison p value came out to be 0.342 which was non-significant. This study found a male preponderance in both groups. This observation was statistically not significant. Study which support this finding is Sostaric and Zalar study[9] (2011), in wheremaleswere 83%. Majority ofthe cases 29 out of 50 (58%) hadeducationalstatusordegreeand above while remaining 31 out of 50 cases belonged to higher and senior school(42%).This finding is in contrast to the previous study done by PreissM etal[10](2009) inwhich42%of the participants were educated up to degree. Another study done by Rajul Tandan et al[11](2002), finds the contrast where 70% of the participants were having education less than 12th grade andtheremaining30% wereeducatedabove 12thgrade. The Mean +S.D was significantly higher in cases as compared to controls 6.20±1.28 vs 2.92±0.72 respectively shows the distribution of cases according to the HAMD score. The maximum number of cases (42%) was achieved at a 5 score, followed by 28% at a 4 score, and 16% at a 3 score. IN comparison to the control, the majority of cases (52%), followed by 36%, were observed at 1 and 2 score respectively. This observation was statistically significant. (P= 0.001S) The mean of HAMD score was significantly higher in cases as compared to controls 4.54±0.93vs 1.60±0.70 respectively (P= 0.001S). Study cases could repeata mean of 5 numbers indigit forward test, in healthy control mean was 6. And hence, there was no impairment in attention and vigilance. Butthis finding is in contrast with the previous study by Hassel Balch BJ et al[12] (2012) ameta-analysis showed deficits in people with MDD in remission phase compared tohealthy subjects, with moderate effect size in domains of attention. Our test finding is could be because of higher educational status of the cases.

Cases performed well in digit forward section, but there was poor performance in digit backward section as compared to control. And hence it was inferred that there was impairment in working memory in cases.

VI. SUMMARY AND CONCLUSION:-

Studies have found that cognitive deficits are the best predictor of functional status in major depressive disorder. Only a few studies have examined attention and working memory in Indian patients with MD Din remission phase and done their comparison with the healthy controls.There was no much impairment in attention and vigilance but it was inferred that there was impairment in working memory in cases.

LIMITATION OF STUDY:-

1. It is a clinical sample of 50, hence results cannot be generalized.
2. Possibility of bipolar disorder could not be ruled out.
3.Social cognition was not assessed

Conflict of interest: - none

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