

Original research article

To Evaluate Short Term Memory Status by Visual Tasks using Alphabetical Test Among Medical Students in JMC Jhalawar

Dr Anjum Nishat ^{1,*}, Dr Shrikant Shete ², Dr Samadhan Mitkari ³¹MD 3rd year Resident, Dept. of Physiology, JMC Jhalawar (Rajasthan)²Senior Professor & HOD, Dept. of Physiology, JMC Jhalawar (Rajasthan)³Assistant Professor, Dept. of Physiology, Seth GSMC & KEM Hospital, Mumbai

Corresponding Author: Dr Anjum Nishat

E-mail: dranjumnishat@gmail.com

Abstract

Introduction: Short term memory is the capacity to store a small amount of information in the mind and keep it readily available for a short period of time. It is essential for daily functioning. The Present study is aimed to establish normal short term memory status by visual tasks in medical students, to evaluate the influence of gender and also to evaluate changes in short term memory status after application of some standard memory improvement methods.

Materials and Method: One hundred ninety nine young healthy medical males and females (83 females and 116 males) of age group 18-25 years were volunteers for this study. Short term memory status by visual tasks before and after memory improvement methods by using alphabetical test were analyzed.

Results: Statistically there was no gender difference in short term memory status in alphabetical test. There was statistically significant improvement in memory status after application of memory improvement methods in all subjects and more so in females.

Conclusion: Progressive decrease in memory status in higher trials of alphabetical test is due to increase in number of bits more than seven as an individual can hold 7 ± 2 bits of information. Due to effectiveness of memory improvement methods, there was statistically significant improvement in memory status in all the subjects and more so in females.

Key words: Short term memory, Alphabetical test, Chunking, Memory status

Introduction

Memory forms part of identity, intelligence and emotions of an individual ¹. Memory is the ability to store and subsequently retrieve past experiences ². Ribot's law states that there is an inverse relationship between the strength of a memory and its recency i.e. old memories are better preserved; indeed, this is often observed at bedside³. Kenneth Davis suggested that Memory is the physical system used to store information during the learning process and to retrieve it when it is needed⁴. It was stated by Elaine Marieb R. N. that Short term memory, also called working memory, is a fleeting memory of the events that continually parade before you⁵. So present study is an attempt to establish short term memory status in medical

students, find out simple short term memory tests and evaluate changes in short term memory status after applying some standard methods for improvement of short term memory

Material and Methods

The present study was conducted in the department of Physiology Jhalawar medical college, Jhalawar.

One hundred ninety nine (199) young adolescent healthy undergraduate boys and girls (83 girls and 116 males) of age group of 18 to 25 years studying in 1st year M.B.B.S of Jhalawar medical college, Jhalawar (Rajasthan) were volunteers for this study. Personal, family and past history was recorded and subjects were also clinically examined to rule out any Neuropsychiatric disorders, mental disorders, head injury, drug history of any anti Psychotics, anti depressants, hypnotics and any other disorders which could affect Short term memory tests by visual task.

In Alphabetical test 6 trials were given. Each trial contained, sets of alphabets i.e. in first trial 2, second 4, third 6, fourth 8, fifth 10 and sixth trial 12 alphabets, like (B, U, N, T, R, Z) etc. Alphabets were flashed for 3 seconds in each trial and subjects were asked to write the alphabets immediately on the paper provided (whatever they remembered). Results were expressed in percentage⁶. Chunking method was used for improvement of alphabetical test. Here the subjects were asked to remember the alphabets in a group of sets, for example, in alphabetical test of trial no.5, P, R, U, D, Y, A, N, I, S, H asked them to make sets of 3 or 4 alphabets like PRU, DYA, NISH Etc.

Statistical analysis:

Statistical analysis of data is done by help of SPSS 23.0 Software (trial Version). Paired T test and Unpaired T test were used in data analysis. P value<0.05 is consider as significant

Table 1: Distribution of pre and post score by using Alphabetical test

Trial	Before		After		T value	P value
	Mean	SD	Mean	SD		
1	99.70	0.06	99.99	0.01	67.255	<0.0001*
2	99.64	0.22	100.00	0.00	23.084	<0.0001*
3	98.20	0.52	99.32	0.07	30.112	<0.0001*
4	90.02	1.50	99.10	0.66	78.161	<0.0001*
5	72.96	1.78	92.61	1.13	131.47	<0.0001*
6	65.95	1.66	86.77	1.19	143.80	<0.0001*
Total	87.75	0.96	96.30	0.51	110.95	<0.0001*

Table 2: Distribution of pre score by using Alphabetical test in Male and Female

Trial	Male		Female		T value	P value
	Mean	SD	Mean	SD		
1	99.95	0.03	99.36	0.09	65.74	<0.0001*
2	99.49	0.36	99.86	0.02	9.347	<0.0001*
3	97.75	0.61	98.84	0.39	14.315	<0.0001*
4	90.42	1.41	89.47	1.63	4.389	<0.0001*
5	73.13	1.96	72.73	1.53	1.551	0.1224
6	65.71	1.63	66.29	1.71	2.425	0.0162*
Total	87.74	1.01	87.76	0.90	0.1440	0.8856

Table 3: Distribution of Post score by using Alphabetical test in Male and Female

Trial	Male		Female		T value	P value
	Mean	SD	Mean	SD		
1	99.98	0.01	100	0.0	18.208	<0.0001*
2	100	0.0	100	0.0	0.00	1
3	99.37	0.04	99.26	0.11	9.9021	<0.0001*
4	98.83	0.61	99.47	0.72	6.765	<0.0001*
5	92.16	0.98	93.24	1.33	6.596	<0.0001*
6	86.02	1.16	87.81	1.23	10.466	<0.0001*
Total	96.06	0.47	96.63	0.57	7.714	<0.0001*

Table 4: Distribution of pre and post score by using Alphabetical test in Male

Trial	Before		After		T value	P value
	Mean	SD	Mean	SD		
1	99.95	0.03	99.98	0.01	10.218	<0.0001*
2	99.49	0.36	100	0.0	15.258	<0.0001*
3	97.75	0.61	99.37	0.04	28.542	<0.0001*
4	90.42	1.41	98.83	0.61	58.959	<0.0001*
5	73.13	1.96	92.16	0.98	93.531	<0.0001*
6	65.71	1.63	86.02	1.16	109.34	<0.0001*
Total	87.74	1.01	96.06	0.47	18.327	<0.0001*

Table 5: Distribution of pre and post score by using Alphabetical test in Female

Trial	Before		After		T value	P value
	Mean	SD	Mean	SD		
1	99.36	0.09	100	0.0	84.785	<0.0001*
2	99.86	0.02	100	0.0	63.773	<0.0001*
3	98.84	0.39	99.26	0.11	9.443	<0.0001*
4	89.47	1.63	99.47	0.72	51.127	<0.0001*
5	72.73	1.53	93.24	1.33	92.171	<0.0001*
6	66.29	1.71	87.81	1.23	93.076	<0.0001*
Total	87.76	0.90	96.63	0.57	75.855	<0.0001*

Results:

The memory status found to be decreased progressively and was statistically significant ($P < 0.05$) in all the subjects.

The mean of memory status before application of memory improvement methods was found to vary i.e. less in females than males in trials 1st, 4th and 5th and more in females than males in trials 2nd, 3rd and 6th, however these variations were not significant statistically ($p > 0.05$).

The memory status found to be increased in all the trials after application of memory improvement methods and was statistically significant ($P < 0.05$)

The memory status after application of memory improvement methods was found to improve more in females than males in all the trials which were statistically significant ($P < 0.05$)

Discussion:

Schwartz R.H, Gruenewald P.J, Klitzner M and Fedio P. concluded that cannabis dependent adolescents have selective short term memory deficit that continue for at least six weeks after the last use of Marijuana in a study entitled “Short term memory impairment in cannabis dependent adolescents”⁷.

In a study entitled “Working memory in mild Alzheimer’s disease and early Parkinson’s disease” by Elizabeth A. Kensinger, Deirdre K Shearer and Joseph J. Locascio, suggests working memory deficits seen in patients with Alzheimer’s disease may be secondary to deficit in other cognitive capacities, including semantic memory⁸.

Evan C.L, McGuire P.K and David S. suggests Schizophrenic patients with hallucination showed poor performance when compared with other patients in a study “Is auditory imagery defective in patients with auditory hallucinations?”⁹.

The memory status after application of memory improvement methods was found to improve more in females than males in all trials which were statistically significant ($p < 0.001$).

The observed improvement in short term memory status is suggestive of effectiveness of chunking method in alphabetical test¹⁰. Females showed statistically significant increased improvement in memory status when compared to males, which may be due to effective and better utilization of chunking method

Conclusion

Statistically there was no gender difference in short term memory status in alphabetical test. There was a statistically significant improvement in memory status in all the trials in all the subjects, male and females after application of memory improvement method like chunking method which may be due to effectiveness of this method. Females showed better improvement than males after application of memory improvement method which was statistically significant which may be due to effective and better utilization of memory improvement method.

Short term memory status by visual task appears to vary with the nature of the test. Short term memory status can be thus assessed by simple tests like alphabetical test which can also be recommended to evaluate short term memory status in diseases affecting memory as bedside tests

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Conflict of Interest: No conflict of interest.

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Ethical Clearance: Approval of the Institutional ethical Committee was taken to conduct the study.

References

1. Yves Ledanseurs, 101 ways to improve your memory. 1st ed. New York: Reader’s digest; 2005. Dennis L. Kasper, Eugene Braunwald, Anthony S. Fauci, Stephen L. Hauser, Dan L. Longo, J. Larry Jameson. Harrison’s principles of internal medicine 16th ed. Vol-II. New York: McGraw Hill medical publishing division; 2005.
2. SM.Jhon.Walton, Brain’s diseases of nervous system.10th ed.English language books society, Oxford university press; 1993.
3. Kenneth Davis, Howard Klar, Joseph T.Coyle. Foundation of psychiatry. 1st ed. Philadelphia: W.B. Saunders; 1991.

4. Elaine Marieb R. N, Human anatomy & physiology. 4th ed. California: Benjamin/Cummings science publishing; 1998.
5. Short term memory quiz <http://www.teacher.scholastic.com/scholasticnews/indepth/headsup/activities/quiz/quiz> (Accessed on 2nd. September 2005).
6. Neuro Science for kids – Memory and learning Vide<http://www.faculty.washington.edu/chudler/chmemory.html> (Accessed on 26th July 2005).
7. Schwartz RH, Gruenewald PJ, Klitzner M, Fedio P. Short-term memory impairment in cannabis- dependent adolescents. *Am J Dis Child.* 1989 Oct; 143(10): 1214-19.
8. Elizabeth A. Kensinger, Deirdre K. Shearer, Joseph J. Locasio, John H. Growdon, Suzanne Corkin. Working memory in mild Alzheimer’s disease and early Parkinson’s disease. *Neuropsychology.* 2003, 17(2): 230-239.
9. Evans C. L, McGuire P. K, David A. S. Is auditory imagery defective in patients with auditory hallucinations? *Psychological medicine.* 2000 Jan; 30(1):137-148.
10. http://www.brain.web-us.com/memory/human_memory.htm (accessed on 15th October, 2005).