ORIGINAL RESEARCH PAPER | Medical Science | Volume : 6 | Issue : 8 | August 2016 | ISSN - 2249-555X | IF : 3.919 | IC Value : 74.50

Neurocognitive Functioning in Patients with Temporal Lobe Epilepsy – A Controlled Study

KEYWORDS: Temporal lobe epilepsy, mesial sclerosis, neurocognition

*** Dr. Pradhyuman Chaudhary**
Assistant Professor, Department of Psychiatry, Government Medical College, Majura Gate, Surat
* Corresponding Author

Dr. Girish Banwari
Psychiatry Specialist at Neuron Psychological Care Center, Abu Dhabi , United Arab Emirates

Dr. Nimesh Parikh
H.O.D.& Professor, Department of psychiatry, Smt. N.H.L. Municipal Medical College, Ahmedabad.

Dr. Hitendra Gandhi
H.O.D.& Professor, Department of psychiatry, G.C.S. Medical College, Ahmedabad.

ABSTRACT ***Objective***: *The study aim to the assess the neurocognitive functioning of patients with temporal lobe epilepsy with either right or left side mesial temporal sclerosis.*

Methods and Material: *Patients diagnosed with temporal lobe epilepsy (confirmed on video EEG) and evident mesial temporal sclerosis (right or left) on MRI Brain was subjected to neurocognitive evaluation on two instruments- PGI Battery of Brain Dysfunction (BBD) and Addenbrooke's Cognitive Examination – ACE-R, Hindi version 2006 for literate subjects and 2010 for illiterate subjects. Areas of cognitive functioning assessed would include memory (verbal and visual), language, intelligence (verbal and performance), visuo-spatial ability, and attention and concentration. Age, gender, education and handedness matched healthy controls with no present/past/family history of epilepsy were subjected to similar neurocognitive assessment for comparison.*

Results: *Remote & Recent Memory, Verbal Memory and visual Memory impairment on PGI battery for Brain Dysfunction for mesial temporal epileptics patients as compare to control. Memory, Fluency, language, visuo – spatial impairment on Addenbrooke's Cognitive Examination Hindi Version 2006 (for literate) and 2010 (for illiterate) for mesial temporal epileptics patients as compare to control*

Introduction:
Mesial temporal lobe epilepsy (MTLE) syndrome is an entity in which the most `predominant seizures are associated with anatomopathological hallmark is sclerosis of the hippocampus and originated in limbic areas of the mesial temporal lobe, particularly in the hippocampus, amygdala, and in the parahippocampal gyrus and its connections [1,2]. In India many studies related cognition assessment in various psychiatric and neurological disorder but no study on epilepsy expect Mishra *et al.* 2002 on epilepsy patients (structural cause of epilepsy were excluded)[3]. So we include mesial temporal lobe epilepsy with hippocampus sclerosis in this study as neuropsychological functioning of epileptic patients almost is ignored in India.

Subjects and Methods:
The study consisted of two groups. The first group comprised of 11 patients suffering from multidrug resistant mesial temporal lobe epilepsy and second group comprised of 11 healthy control matched for age, sex, years of schooling, handedness with no present or –past history of epilepsy and no family history for epilepsy. Epileptic patients diagnosed confirmed by MRI Brain with epileptic protocol and video EEG.

Both group's neurocognitive evolution done by two instruments –PGI Battery of Brain Dysfunction (PGI-BBD)[4] includes remote memory, recent memory, mental balance, attention & concentration, delayed recall, immediate recall, retention similar pairs, retention dissimilar pairs, visual retention, performance tests of Intelligence, verbal adult intelligence, Nahor benson test, Bender gestalt test and Addenbrooke's Cognitive Functioning (ACE-R)[5] assessed is include attention & orientation, memory, fluency, language and visuo spatial. Both PGI-BBD and ACE-R both tests are validated.

Results:
In study, statically significance found for remote memory, verbal memory and visual memory in patients with MTSE as compare to control group on PGI battery for brain dysfunction. On ACE-R Hindi version 2006 was statically significance for Memory, Fluency, Language, Visouo-spatial in patients with MTSE as compare to control group. No correction for Age, gender, education or right/left mesial temporal lobe epilepsy in both groups.

Table 1: Results summary of MTSE (n=10) and control groups (n=10) on PGI battery for Brain Dysfunction.

SCALESt	EPILEPTICS-MTSE (n=11)		CONTROL (n==11)		t- VALUE	P-VALUE
	Mean	SD	Mean	SD		
Remote Memory	4.73	1.555	6.0	.000	-2.71	.001
Recent Memory	4.55	0.5220	5.0	0.000	-2.88	.000
Mental Balance	5.00	2.608	6.45	1.864	-1.50	.308
Attention & Concentration	7.18	1.779	8.27	2.195	-1.28	.694

Delayed Recall	6.91	1.446	8.18	1.601	-1.95	.820
Immediate Recall	7.45	2.697	10.64	1.629	-3.35	.034
Retention similar pairs	4.00	1.095	4.73	0.647	-1.90	.040
Retention Dissimilar pairs	6.00	3.286	11.55	2.067	-4.74	.102
Visual Retention	7.45	4.569	10.18	2.401	-1.75	.055
Recognition	6.773	2.918	9.50	0.866	-2.971	.010
Performance Intelligence	107.200	26.825	97.682	10.240	1.099	.014
Verbal Intelligence- Information	69.73	28.513	103.00	12.954	-3.524	.234
Verbal Intelligence- Digit span	75.27	26.207	94.82	16.339	-2.10	.566
Verbal Intelligence- Arithmetic	75.00	33.900	97.64	11.587	-2.10	.002
Verbal Intelligence- Comprehension	89.82	40.012	115.09	15.076	-1.96	.050
Verbal Intelligence - Total	101.45	62.112	102.636	11.367	-.062	.090
Nahor Benson test	3.18	2.994	0.82	1.079	2.05	.077
Bender gestalt test	11.09	8.420	5.64	2.693	2.05	.020
Dysfunction Rating Score	27.36	8.418	7.73	3.849	7.04	.022

Table 2: Results summary of MTSE (n=10) and control groups (n=10) on Addenbrooke's Cognitive Examination revised (ACE-R) Hindi version 2006.

ACER HINDI	EPILEPTICS		CONTROL		t- VALUE	P-VALUE
	Mean	SD	Mean	SD		
Memory	17.55	5.37	23.36	2.06	-2.750	0.012
Fluency	7.27	2.32	9.09	0.83	-2.440	0.024
Language	23.82	2.22	25.45	0.93	-2.246	0.036
Visuo Spatial	13.64	2.976	16.00	0.00	-2.634	0.016
TOTAL ACER	78.55	11.52	91.82	2.82	-3.709	0.001

Discussion:

Our finding suggest that the ability of remote & recent memory, verbal memory is systematically related to the integrity of mesial temporal lobes in patients with MTSE on PGI-BBD; Memory, fluency, language, visuo-spatial integrity in patients with MTSE on Addenbrooke's Cognitive Examination Hindi version 2006 for literate and 2010 for illiterate.

In our study no statically significance found to lateralization of epileptogenic focus in temporal lobe on PGI-BBD and Addenbrooke's cognitive examination both 2006 and 2010 which finding comparable study did by I Wisniewski et al.2012 [6] which concluded impairment in visual memory, non-verbal reasoning, attention flexibility and visual planning. Mishra et al.2002 [3], concluded intelligence decline in epileptics as compare with control but in our study no decline in both performance and verbal intelligence. Yi-fat Glikmann-Johnston et al.2008 [7], explore the effects of lateralized mesial temporal damage on three measures of spatial learning: navigation, object location and drawing and to determine the relationship between volumetric of hippocampus and memory performance signified in epileptics patients which were not tested in our study. M.M.saling et al.2009 [8] concluded that verbal memory impairment found in MTSE patients which correlate with our study finding. Mc Andrew et al 2012[9] concluded that impairment in episodic memory in MTSE patients which also correlated with our study.

Helmstaedter C et al[10] concluded that low levels of intelligence (IQ<85) are reported in about 30% of the patients and cognitive decline in 70% of the patients and our study no statically significance found for either verbal or performance intelligence in MTSE patients as compare to match control.

Neuropsychological functioning of epileptic patients is almost ignored area in India. Most of the clinicians treat epilepsy symptomatically, without consideration of its cognitive aspect in terms of neuropsychological rehabilitation as cognitive impairment found patient with epileptic patients.

Acknowledgement:
We thank Department of neurology, V.S. hospital, Dr.Prutha, Dr.Asim, Dr. Ankit, Depratment od Psychiatry for constructing the virtual house.

References:

1. Engel J Jr; International League against Epilepsy (ILAE). A proposed diagnostic scheme for people with epileptic seizures and with epilepsy: report of the ILAE Task Force on Classification and Terminology. Epilepsia. 2001 Jun; 42(6):796-803.
2. Wieser HG; ILAE Commission on Neurosurgery of Epilepsy. ILAE Commission Report. Mesial temporal lobe epilepsy with hippocampal sclerosis. Epilepsia. 2004 Jun; 45(6):695-714.
3. Mishra BP, Mahajan R, Dhanuka A, Narang RL.Neuro-psychological profile of epilepsy on luria-nebraska neuropsychological battery.2002 Jan;44(1):53-6.
4. D. Pershad and S. Verma, Handbook of PGI Battery of Brain Dysfunction (PGI-BBD), National psychological corporation, Agra, India, 1990.
5. Mioshi E, Dawson K, Mitchell J, Arnold R, Hodges JR, The Addenbrooke's Cognitive Examination Revised (ACE-R): a brief cognitive test battery for dementia screening. Int J Geriatr Psychiatry.2006 Nov; 21(11):1078-85.
6. Wisniewski I, Wendling AS, Manning L, Steinhoff BJ, Visuo-spatial memory tests in right temporal lobe epilepsy foci: clinical validity. Epilepsy Behav. 2012 Mar; 23(3):254-60.
7. Y. Glikmann-Johston, M.M.Saling, J.Chen, K.A.Cooper, R.J.Beare, and D.C. Rerturns, "Structural and function correlates of unilateral mesial temporal lobe spatial memory impairment". Brain, vol131, no.11, pp.3006-3018, 2008.
8. M. M. Saling, "Verbal memory in mesial temporal lobe epilepsy: beyond material specificity," Brain, vol.132, no. 3, pp.570-582, 2009.
9. McAndrews MP, Cohn M.Neuropsychology in temporal lobe epilepsy: influences from cognitive neuroscience and functional neuroimaging. Epilepsy Res Treat. 2012; 2012:925238.
10. Helmstaedter C, Elger CE.Chronic temporal lobe epilepsy: a neurodevelopmental or progressively dementing disease? Brain. 2009 Oct; 132(Pt 10):2822-30.