



Effect of Diazepam on cognitive functions newly diagnosed epileptic patients

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ABSTRACT

The current study was undertaken to observe effect of diazepam use on cognitive functions in newly diagnosed epileptic patients. 10 Patients with newly diagnosed epilepsy and 30 healthy, age matched controls, including both males and females, were included in the study. Cognitive functions were analyzed by spatial and verbal memory test and Mini Mental state Examination (MMSE). Our study we have not observed significant decline in memory after using diazepam. We recommend further detailed studies in this area including assessment of biomarkers to understand effects of diazepam on cognitive functions to recommend this drug for benefit of epileptic patients.

Key words: Cognition, Diazepam, Epilepsy.

INTRODUCTION

According to WHO estimation, 8 people per thousand are affected with epilepsy.¹ It was reported that in India, 55, 00,000 persons effected with epilepsy. Cognitive dysfunction was most commonly reported by epileptic patients. Many factors are responsible for change in cognitive functions in epileptic patients, which includes types of drugs also.²⁻⁶ Anti-epileptic drugs suppress cognitive functions by increasing release of neuro transmitters or by decreasing excitability of neurons. Though anti-epileptic drugs are reported to cause cognitive decline, they may not be the only source to cause cognition impairment as many factors are reported to cause this in epileptic patients. Memory is to be effected by anti-epileptic drugs.⁵ Further, decline in memory will have negative impact on quality of life which is difficult for physicians to proceed with the therapy. The current study was undertaken to observe effect of diazepam use on cognitive functions in newly diagnosed epileptic patients

MATERIALS AND METHODS

The present study was prospective study conducted at Department of General Medicine, Andhra Medical College, King George Hospital,

Visakhapatnam, Andhra Pradesh. The study was approved by institutional ethical committee. All values were collected before and after 6 months of treatment in both the groups.

Cases and controls: 10 Patients with newly diagnosed epilepsy and 10 healthy, age matched controls, including both males and females, were included in the study after obtaining written and informed consent. The following criteria were followed while selecting the patients as cases.

Inclusion criteria

1. All types of epileptic patients
2. Willing participants

Exclusion criteria

1. Unwilling participats
2. Any complications
3. Undergoing any other therapy or treatment or use of any other kind of drugs
4. Children below 15 years

Tests for assessment of cognitive functions

Verbal and spatial memory test: It was a standard test to assess spatial and verbal memory.⁷

The Mini Mental State Examination (MMSE): It is a tool that can be used to systematically and

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thoroughly assess mental status. It is an 11-question measure that tests five areas of cognitive function: orientation, registration, attention and calculation, recall, and language. The maximum score is 30. A score of 23 or lower is indicative of cognitive impairment. The MMSE takes only 5-10 minutes to administer and is therefore practical to use repeatedly and routinely.⁸

Statistical analysis: Data was analyzed by SPSS 20.0 using paired t test. P value<0.01 was considered as significant. Data was expressed as Mean \pm SD.

RESULTS

Results are presented in table 1 to table 4. Table 1 presents demographic data of the participants, which is not significantly different among cases and controls. Table 2 compares cognitive functions of cases and controls before the medication and we have not observed significant difference between cases and controls. Table 3 compares cognitive functions of cases and controls after the medication and we have not observed significant difference between cases and controls. Table 4 compares cognitive functions in cases alone before and after intervention. No significant difference was observed in cognitive functions following use of diazepam.

Table no:1 Demographic data of the participants

| Sno | Parameter | Cases (n=10) | Controls (n=10) |
|-----|-----------------------|-------------------|-------------------|
| 1 | Age* | 45.62 \pm 2.11 | 47.15 \pm 1.32 |
| 2 | Gender (Male: Female) | 7:3 | 6:4 |
| 3 | Height* | 155.42 \pm 7.48 | 153.82 \pm 9.22 |
| 4 | Weight* | 64.76 \pm 20.13 | 66.37 \pm 18.39 |

*Values expressed in Mean \pm SD. There is no statistically significant difference in between groups.

Table no:2 Cognitive functions of the participants before intervention in cases and controls

| Sno | Parameter | Cases (n=10) | Controls (n=10) | P value |
|-----|----------------|--------------|-----------------|---------|
| 1 | Spatial Memory | 5 \pm 1 | 7 \pm 1 | P>0.05 |
| 2 | Verbal Memory | 4 \pm 2 | 6 \pm 3 | P>0.05 |
| 3 | MMSE | 23 \pm 2 | 26 \pm 1 | P>0.05 |

Values expressed in Mean \pm SD. #P<0.05 is significant, ##P<0.01 is significant, ###P<0.001 is significant.

Table no:3 Cognitive functions of the participants after intervention in cases and controls

| Sno | Parameter | Cases (n=10) | Controls (n=10) | P value |
|-----|----------------|--------------|-----------------|---------|
| 1 | Spatial Memory | 4 \pm 1 | 7 \pm 1 | P>0.05 |
| 2 | Verbal Memory | 4 \pm 1 | 6 \pm 3 | P>0.05 |
| 3 | MMSE | 21 \pm 3 | 26 \pm 1 | P>0.05 |

Values expressed in Mean \pm SD. #P<0.05 is significant, ##P<0.01 is significant, ###P<0.001 is significant.

Table no:4 Cognitive functions of the participants before and after intervention in cases

| Sno | Parameter | Before (n=10) | After (n=10) | P value |
|-----|----------------|---------------|--------------|---------|
| 1 | Spatial Memory | 5 \pm 1 | 4 \pm 1 | P>0.05 |
| 2 | Verbal Memory | 4 \pm 2 | 4 \pm 1 | P>0.05 |
| 3 | MMSE | 23 \pm 2 | 21 \pm 3 | P>0.05 |

Values expressed in Mean \pm SD. #P<0.05 is significant, ##P<0.01 is significant, ###P<0.001 is significant.

DISCUSSION

Treatment with any drug has its own side effects. However, it depends on dosage of administration. When used excessive dose, it may lead to cause defects in cognition. However, it is difficult to understand and study the cognitive defects as many other factors also interfere with these cognitive functions. The present study was thus undertaken to observe use of diazepam and its effects on

cognition. Earlier studies reported that the performance of the epileptic patients was significantly poorer than that of the controls.⁹ In the current study we have not observed significant difference in the cognitive functions before and after the use of medication in cases. The cases cognitive functions are not significantly varied when compared with control before and after the intervention.

Limitations: Our major limitation is less sample size. The study conducted at only one centre. So generalizations are not possible.

Conclusion: Our study we have not observed significant decline in memory after using

diazepam. We recommend further detailed studies in this area including assessment of biomarkers to understand effects of diazepam on cognitive functions to recommend this drug for benefit of epileptic patients.

REFERENCES

1. Palanisamy A, Sankaravadivu T, Subasini U, Narmadha MP, Rajendran NN. Antiepileptic Drugs and Cognitive Impairment in Epileptic Patients at a Private Hospital. *RJPBCS*. 2011;3(2):824-829.
2. Motamedi G, Meador K. Epilepsy and cognition. *Epilepsy Behav*. 2003;4(Suppl 2):S25-S38.
3. Aldenkamp AP, De Krom M, Reijs R. Newer antiepileptic drugs and cognitive issues. *Epilepsia*.2003;44(Suppl 4):S21-S29.
4. Ortinski P, Meador KJ. Cognitive side effects of antiepileptic drugs. *Epilepsy Behav*. 2004;5(Suppl 1):S60-S65.
5. Meador KJ. Cognitive outcomes and predictive factors in epilepsy. *Neurology*. 2002;58:S21-S26.
6. Bourgeois BF. Determining the effects of antiepileptic drugs on cognitive function in pediatric patients with epilepsy. *J Child Neurol*. 2004;19(Suppl 1):S15-S24.
7. Manjunath NK, Telles S. Spatial and verbal memory test scores following yoga and fine artscamps for school children. *Indian J Physiol Pharmacol* 2004; 48: 353-356.
8. Folstein MF, Folstein SE, McHugh PR: "Minimal state: A practical method for grading the cognitive state of patients for the clinician." *J Psychiatr Res* 1975; 12:189-198.
9. Florindo Stella, Jayme Antunes Maciel. *Arq Neuropsiquiatr* 2004;64 (4):983-7.