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ORIGINAL ARTICLE

Frequency of Vitamin D Deficiency in Patients of Epilepsy on Valproate Sodium

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ABSTRACT

Aim: To determine the frequency of vitamin D deficiency in patients of epilepsy on valproate sodium.
Study design: Case control study
Place and duration of study: Department of Neurology, Chandka Medical College Hospital, Larkana and Khairpur Medical College, Khairpur Mir's from 1st July 2021 to 31st December 2021.
Methodology: One hundred adults were enrolled which were further divided into two groups. Those patients suffering from clinically determined epilepsy (n=50) and treated for epilepsy were placed in group A and were treated with sodium valproate while healthy adults within same age group were placed in group B (n=50). Clinical assessments were made through neurological assessment for epilepsy. A blood of 2cc was withdrawn from group A and B participants and tested for 25(OH) vitamin D levels by and serum sodium valproate (in only group A) using enzyme linked immunosorbent assay.
Results: The mean of group A patients was 24.2±3.5 years while of group B was 28.3±1.5 years. The dosage of sodium valproate in mg/d was given as a mean value of 869± 350.9. The mean serum levels of sodium valproate as assessed was found as 79.8 mmol/L. Body Mass Index value showed that obesity was significantly highly common in group a than Group B.A comparison of vitamin D levels between group A and Group B showed that the severe deficiency as well as deficiency of vitamin D was significantly prevalent (56%) in epileptic group such as group A while insufficiency was also higher in the similar group A.
Conclusion: There was a high frequency of vitamin D deficiency in patients with epileptic condition and getting treated with sodium valproate.
Key words: Frequency, Vitamin d deficiency, epilepsy, Valproate sodium

INTRODUCTION

Sodium valproate is one of the most prescribed epileptic drugs over the globe. It has a broad-spectrum activity against epilepsy not only in partial epilepsy cases but also in generalized epilepsy[1].

The treatment of epilepsy in most cases is not of short duration and can last for lifetime highlighting the significance of drug required safety during the therapy for patient healthcare. There have been reported literatures on obesity an endocrinal abnormality in epileptic patients with fertility issues as polycystic ovarian syndrome in females as well as alopecia and hyperandrogenism with sodium valproate treatment[2-4]. Obesity has been most frequently reported as a side effect of sodium valproate with a prevalence of up to 70% in various populations[5-8].

In addition to this sodium valproate usage in epilepsy have also been related with increased levels of fasting blood sugar and metabolic syndromes. A high level of triglycerides and other lipid profile tests such as cholesterol, low density lipids; abnormal ranges have also been reported in the literature with its usage[9-13].

The diagnosis of epilepsy is associated with a clinical occurrence of un-provoked seizure due to epilepsy with a second soon after or an electroencephalogram evidence. Clinical information plays an important role in its diagnosis and characterization. Antileptic drugs as sodium valproate has a strong role in prevention of epileptic episodes and seizures[14]. However, this drug has an effect on vitamin D levels which has been recently targeted in various researches for further elaboration and awareness[15-18].

The present study was also generated for the same purpose of identification of the effect of sodium valproate on vitamin D levels of epileptic patients.

MATERIALS AND METHODS

This case control study was conducted after IRB permission in the Department of Neurology, Chandka Medical College Hospital, Larkana and Khairpur Medical College, Khairpur Mir's from 1st July 2021 to 31st December 2021. A 100 adults were enrolled which were further divided into two groups. Those patients suffering from clinically determined epilepsy (n=50) and treated for epilepsy were placed in group A and were treated with sodium valproate while healthy adults within same age group were placed in group B (n=50). Clinical assessments were made through neurological assessment for epilepsy. The selected age group was from 18-30 years. Patients suffering from cerebral palsy, mental abnormalities and those who were not recently on medication or in other cases on vitamin D supplementation were excluded from the study. Patient's age, gender, body mass index, vitamin D levels, clinical and mediational history were recorded on a well-structured questionnaire. Epileptic history and type of seizures as well as their frequency within last 3 months and duration of epileptic drugs taken was also recorded. A blood of 2cc was withdrawn from group A and B participants and tested for 25(OH) vitamin D levels by and serum sodium valproate (in only group A) using enzyme linked immunosorbent assay. For the purpose serum was separated and stored at -20°C until tests analysis. All standard quality control protocols were strictly maintained during biochemical analysis. Severe vitamin D deficit was termed as <5ng/ml; while Vitamin D deficiency was taken as between 5-20ng/ml; insufficiency as 21-29 ng/ml and between sufficiency as 30-70ng/ml. Data was analyzed by using SPSS version 25.0. Chi square was used for analysis of the results through SPSS-25. The Chi square test was applied and P value less 0.05 considered as significant.

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RESULTS

The mean of group A patients was 24.2±3.5 years while of group B was 28.3±1.5 years. The dosage of sodium valproate in mg/d was given as a mean value of 869± 350.9. The mean serum levels of sodium valproate as assessed was found as 79.8 mmol/L. Majority of the patients has a clinical history of seizures as 6.6 years on average value (Fig. 1).

Table 1: Baseline characteristics of group A and B

Variable	Group A	Group B	P value
Gender			
Male	26 (52%)	33 (66%)	0.33
Female	24 (48%)	17 (34%)	0.25
Age (year)			
18-23	31 (62%)	27 (54%)	0.32
24-26	12 (24%)	10 (20%)	0.44
27-30	7 (145)	9 (18%)	0.45
Body mass index			
<18	18 (39%)	21 (42%)	0.12
19-29.8	22 (44%)	25 (50%)	0.54
>30	10 (205)	4 (8%)	0.03

The base line characteristics of the group A and B presented that there was no significant difference in the gender distribution between group A and B. However, in both of the groups there were more males than females present. Group B was deliberately enrolled with similar age as of Group A for better comparison. The age 18-23 years had highest participant prevalence. Body Mass Index value showed that obesity was significantly highly common in group A than group B (Table 1).

A comparison of vitamin D levels between group A and Group B showed that the severe deficiency as well as deficiency of vitamin D was significantly prevalent (56%) in epileptic group such as group A while insufficiency was also higher in the similar group A (Table 2). Within the deficient cases and controls a significant ($p<0.05$) number of females were suffering from vitamin D deficiency, despite the fact that either they were from Group A or Group B (Fig. 2).

Table 2: Comparison of Vitamin D status within group A and B

Vitamin D level	Group A	Group B	P value
Severe deficiency	17 (34%)	1 (2%)	0.001
Deficiency	11 (22%)	7 (14%)	0.01
Insufficiency	15 (30%)	32 (64%)	0.02
Sufficient	7 (14%)	10 (20%)	0.11

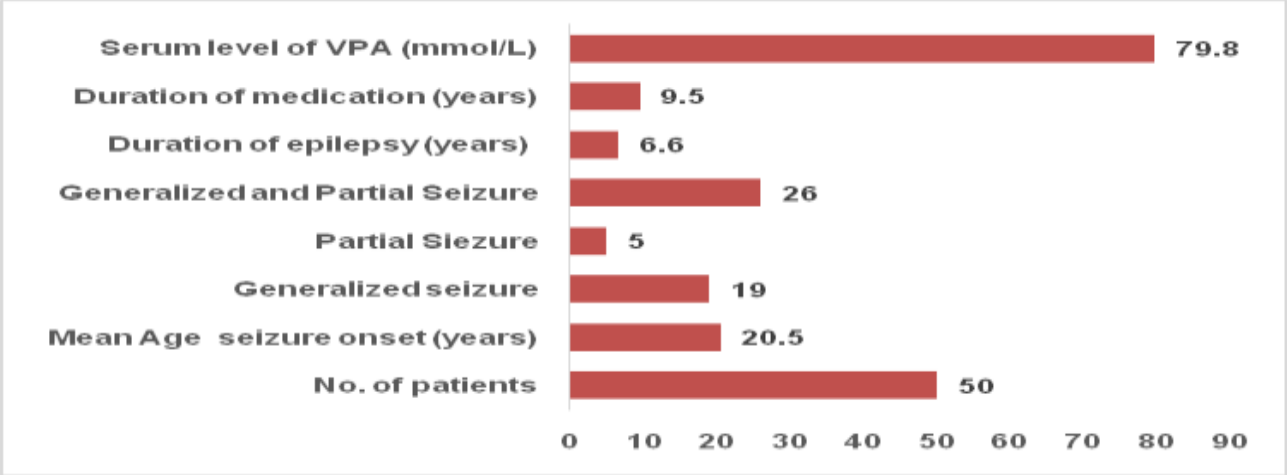

Fig. 1: Clinical history

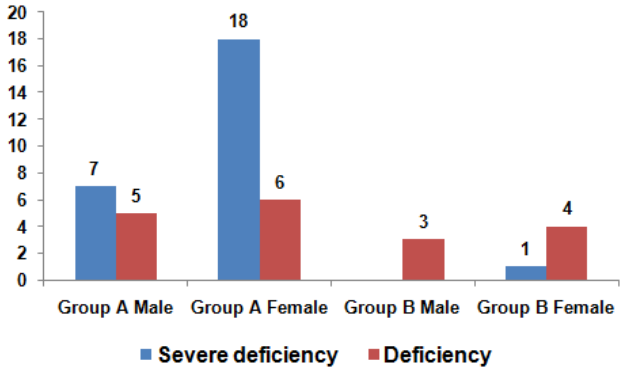

Fig. 2: Comparison of Vitamin D deficiency in male and females from group A and B

DISCUSSION

In the current research age similar cases and control were enrolled. The variance in the gender of both groups and BMI was also noted. The present study results showed no statistical variance between the gender of both groups however there were more obese epileptic patients than controls. Previous literature on a different age group population have reported also reported that vitamin D level was observed to be decreased in patients with higher level of obesity[19,20].

Other literature has also detailed fact like epileptic women have higher risk of lower vitamin D than epileptic men[14]. In the present study similar association was detailed. The reason behind this could be an overall decline of vitamin D in women than in comparison to the men as women have less sun exposure than men. Moreover, in Islamic societies like of Pakistan women prefer covering their body and face leaving most of the body parts covered an un exposed form the sun rays therefore decreasing the ability of the skin to activate vitamin D through ultraviolet rays assistance and decreasing overall vitamin D levels in them. The evidence of this pattern was that not only epileptic but health women were also having comparatively low vitamin D levels than men[15].

Patient's results when compare with controls showed a significant variance in vitamin D deficiency cases with high prevalence in epileptic patients emphasizing on the fact that sodium valproate was affecting and decreasing their vitamin D levels.[21] A regular monitoring of vitamin D levels in epileptic patients could be an efficient management protocol where in cases of deficiency of this mineral supplementation could be suggested for proper bone and mental health care of patients.

CONCLUSION

Sodium valproate significantly affects and decrease vitamin D levels with a high frequency as 56% and causes its deficiency.

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