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The Correlation of Long-term Combination Treatment of Valproic Acid and Topiramate on Serum Vitamin D Levels among Children with Epilepsy

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Abstract


Background: Epilepsy is a chronic condition characterized by unprovoked seizures. Vitamin D is necessary in the process of child development and is strongly influenced by the presence of anti-epileptic drugs.


Objective: To determine the correlation of the duration of treatment and serum vitamin D levels in children with epilepsy who use the combination of valproic acid and topiramate


Methods: A cross sectional study among forty pediatric patients with epilepsy with an age range of 5-10 years at Dr. Kariadi Hospital Semarang. Examination of serum vitamin D levels is done by examination of blood serum. Statistical analysis using Spearman correlation test and Chi-square test with significance level $p = 0.05$.

Results: The mean of serum vitamin D levels after 24 months of the combination treatment was 21.87 ± 1.21 ng/ml, 27.94 ± 2.40 ng/ml in those who still having seizures were, and 23.23 ± 2.07 ng/ml among who receiving receiving delayed therapy 23.23 ± 2.07 ng/ml. Bivariate analysis depicted that there was negative correlation between duration of treatment ($\rho = -0.850$, $p < 0.001$), onset of therapy ($\rho = 0.604$, $p < 0.001$) and seizure frequency ($\rho = 0.559$, $p < 0.001$) with and serum vitamin D levels. Partial correlation analysis after adjusted by onset of therapy and seizure frequency, revealed that there was a correlation between duration of treatment and serum vitamin D levels ($\rho = -0.839$, $p < 0.001$) and $\rho = -0.856$ ($p < 0.001$).

Conclusion: There is a correlation between the duration of treatment and serum vitamin D levels among children with epilepsy.

 Santoso Jaeri
What method? ELISA?

 Santoso Jaeri
Are you sure that this test used? Partial correlation?

 Santoso Jaeri
Why there is two rho? and p?

Kariadi National Hospital serves National Health insurance. Patients who are treated at this hospital, especially epilepsy, are patients who receive combination therapy with anti-epileptic drugs including the administration of a combination of Valproic Acid and Topiramic, where combination treatment is most often given to pediatric patients with epilepsy.

2. METHOD


This study is a cross-sectional study, which was conducted at the outpatient Department of Neurology, dr. Kariadi National Hospital, Semarang from November 2020 to January 2021. The research subjects were pediatric epilepsy patients who received a combination of Valproic Acid and topiramate after 6 months, 12 months, and 24 months with an age range of 5-10 years. Meanwhile, the exclusion criteria for pediatric patients were obese or undernourished, impaired kidney function, patients taking vitamin D supplementation, and severe side effects due to Valproic Acid and Topiramic therapy.


This research has received permission from the Ethics Committee of the Faculty of Medicine UNDIP with the number 619/EC/KEPK-RSDK/2020 dated


September 14, 2020. Patients were selected based on inclusion and exclusion criteria, then informed consent was given to the patient. The study began with a history and physical examination. Then our patient took a blood sample to check vitamin D levels in the pediatric outpatient department of the neurology department of Dr Kariadi Hospital. After completion, the blood sample is sent to the GAKI Laboratory.


The data were processed using SPSS Statistics for Windows version 23 program to determine the relationship between the duration of treatment with the combination of valproic acid and topiramate on serum vitamin D levels. Correlation test was conducted with a 95% confidence level. The variables suspected to be confounders, namely the frequency of seizures, starting therapy, age of onset of epilepsy will be tested using a bivariate test with the Spearman correlation test. Gender will be tested using the chi-square test. Then a partial correlation test will be carried out by controlling the frequency of seizures and starting therapy with the significance level $p = 0.05$.

3. RESULTS

 Santoso Jaeri
Typo? Should be capital for the first letter? or just valproic acid? I found this a lot

 Santoso Jaeri
Should be checked, I presume that is Topiramate, typo? I found this a lot.

 Santoso Jaeri
Department of Neurology or Neurology Department? Outpatient clinic, Department of Neurology?

 Santoso Jaeri
Will be or already done?


 Santoso Jaeri
I found some inconsistency for the way to interpret the results, sometime use correlation, sometime with association, relationship? So which one do you want to use? In your data there is rho so I presume that it is better if you use correlation

Table 1. Demographic and Clinical Data

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THE CORRELATION OF LONG-TERM COMBINATION TREATMENT OF VALPROIC ACID AND TOPIRAMATE ON SERUM VITAMIN D LEVELS AMONG CHILDREN WITH EPILEPSY

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Conclusion: There is a correlation between the duration of treatment and serum vitamin D levels among children with epilepsy

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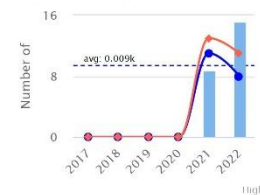
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