

ABSTRACT**ANALYSIS OF CORRELATION BETWEEN AMPK LEVELS AND BODY MASS
CHANGES IN PEDIATRIC EPILEPTIC SEIZURE UNDERGOING VALPROIC
ACID MONOTHERAPY**

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Background : Epilepsy is a neurological disorder that occurs due to the abnormality of neurons in the brain and an imbalance between excitation and inhibition of the central nervous system (CNS). Valproic acid (VPA) is the first line treatment for seizures in children with high success rate as a monotherapy and has a broad spectrum activity. However, the reported side effects of VPA includes weight gain, ranging from 10% to 70%. The mechanism of VPA-related weight gain is reported through its inhibitory effect on histone deacetylase (HDAC) and inhibition of adipoectin gene expression in adipocytes, thereby reducing peripheral AMPK activity. AMPK is a major biomarker that plays a role in regulating metabolism where its activation can inhibit Acetyl CoA Carboxylase (ACC) and HMG Co-A reductase, which will reduce the synthesis of fatty acids and cholesterol.

Objective : The aim of this prospective observational cohort study was to analyze the correlation between AMPK levels and weight gain in epileptic seizures patients undergoing valproic acid monotherapy.

Method : This study was conducted with an observational prospective cohort design. Data was collected from April to June 2019. The inclusion criterias were children aged 2-18 years who used VPA monotherapy regimens < 2 years, not taking any drugs that affect body mass and were not diagnosed with nephrotic syndrome, systemic lupus erythematosus, and diabetes mellitus. Measurements of body weight and AMPK levels were performed on subjects who came to the clinic at the time of the study and after 1 month taking VPA.

Result : A total of 17 subjects participated in this study. The results of the statistical tests found a significant increase ($p = 0.047$) using paired t-test between pre and post body mass measurement, while the pre and post AMPK levels decreased even though there was no statistically significant difference ($p = 0.055$). After testing the correlation with Pearson test, it was found that there was no significant correlation ($p = 0.178$) between changes in body mass and AMPK level. From the study, 12 subjects experienced an increase in body mass followed by a decrease in serum AMPK levels, it showed that the increase in body mass was not correlated with AMPK levels even though it was not statistically significant.

Conclusion : There was no significant correlation between weight gain and AMPK level changes in pediatric epileptic seizures undergoing valproic acid monotherapy.

Keyword: AMPK, Epileptic Seizure, Pediatric, Valproic Acid, Weight gain.