

## Research Article

---

# Effect of Valproic Acid on Retina

Hayani M\*, Wandarian K

Binayitab Eye Clinic, Shiraz, Iran

**\*Corresponding Author:** Hayani M, Binayitab Eye Clinic, Shiraz, Iran, E-mail: [dr.hayani2016m@gmail.com](mailto:dr.hayani2016m@gmail.com)

**Received:** 27 April 2019; **Accepted:** 09 May 2019; **Published:** 14 May 2019

### Abstract

Anti-epileptic drugs (AEDs) are the main form of treatment for people with epilepsy. Around 70% epileptic patients may have their seizures controlled by taking these medications. Valproic acid is one of the most common drugs using for epileptic patients. This drug has some side effects like nausea, vomiting, bleeding, abdominal cramps, diarrhea, headache. In this research, we want to study on possible side effects of Valproic acid on eye in patients with epilepsy.

**Methods and Materials:** In this study, we had 28 patients suffering from epilepsy and seizures who take Valproic acid for at least two years. The control group was included of 28 subjects with no history of taking this drug and no visual problem. Electroretinogram (ERG) obtained were compared with both groups to find possible changes.

**Results:** The mean voltage of ERG was  $92.98 \pm 12.67$  and  $92.16 \pm 13.47$   $\mu\text{V}$  in case and control groups, ( $P > 0.05$ ). The mean latency was  $43.2 \pm 3.06$  and  $44.80 \pm 4.36$  msec in case and control groups, with  $P > 0.05$ . These findings show that there is no Significant difference in ERG parameters in case and control groups.

**Conclusions:** By the result of this research, it can be concluded that Valproic acid does not have any side effects on the retina in patients taking this drug.

**Keywords:** Epilepsy; Visual Pathway; Electroretinogram; Valproic Acid

### 1. Introduction

Epilepsy is one of the most common neurologic conditions in the world, with an incidence of almost 50 new cases per year per 100,000. About one-third of epileptic patients have refractory seizures that are not controlled by two or more antiepileptic medications [1]. Valproic acid has been an effective antiepileptic drug that is particularly useful for the management of generalized epilepsies [2]. This drug is one of the most common drugs using for the

management of seizures in epileptic patients in the world [3]. In our study, we used Electroretinogram to see if this drug has side effects on the retina. Electroretinogram (ERG) is an electrical potential generated by the retina in response to light and recorded from the corneal surface of the eye. It can be used in different ways to assess retinal function [4].

## **2. Methods**

In this study, two groups were included. 28 patients suffering from epilepsy (without visual problems) taking Valproic Acid for management their seizures for at least 2 years and 28 subjects as a control group without such history were participated. The ERG was taken for all. The results were compared between two groups. We used Statistical Procedures for Social Sciences (SPSS) version 13.0 for data analysis.

## **3. Results**

The mean latency of ERG in case group was  $43.2 \pm 3.06$  and in control group was  $44.80 \pm 4.36$  msec which shows no statistically significant difference ( $P > 0.05$ ). The mean voltage in case group was  $92.98 \pm 12.67$  and  $92.16 \pm 13.47$   $\mu$ V in the control group ( $P > 0.05$ ).

## **4. Discussion**

Two ERG parameters in our study, mean latency and voltage were similar in both groups. Our study has the same result with Naser M [3] that showed Valproate had no effect on parameters in the ERG. The study by Ozkul, et al. on ERG also showed that this drug did not result in adverse effects in retina [5]. Other research by Sorrie, resulted no side effect on the retina in patients taking Valproate for a long time [6]. Lobefalo research results explained that retinal nerve fiber layer and macular thickness in patients under one-year treatment with this drug had no significant change [7]. These four works support the findings of our study. A research was done by Farabi, et al. concluded that sodium valproate affects the visual pathway of epilepsy patients, which can be proved by visual evoked potential [8]. This is in contradiction with the result of our study. Verrotti and colleagues reported that short treatment duration with valproate can result in retinal dysfunction mainly color vision problems [9] which does not support this study.

## **5. Conclusion**

According to the results of this study, it may be concluded that Valproic acid would have no effect on retinal function and thereby no periodic retinal assessment is recommended in patients taking this medication. However, further studies should be performed to confirm the findings of the present study.

## **References**

1. Carl E Stafstrom, Lionel Carmant. Seizures and Epilepsy: An Overview for Neuroscientists. Cold Spring Harb Perspect Med 5 (2015): 022426.

2. Torbjorn Tomson, Dina Bottino, Emilio Perucca. Valproic acid after five decades of use in epilepsy. *The Lancet Neurology* 15 (2016): 210-218.
3. Naser M, Shushtarian SM. Study the Effect of Depakine on Retina of Epileptic Patients using Electroretinogram. *International journal of scientific research* 3 (2014).
4. Alice Brandli and Jonathan Stone. Using the Electroretinogram to Assess Function in the Rodent Retina and the Protective Effects of Remote Limb Ischemic Preconditioning. *JOVE* 100 (2015): 52658.
5. Ozkul Y, Gurler B, Uckardes A, et al. Visual functions in epilepsy patients on Valproate monotherapy. *Journal of clinical neuroscience* 9 (2002): 247-250.
6. Sorri I, Rissanen E, Mantjarvi M, et al. Visual Function in epilepsy patients treated with initial valproate monotherapy. *Seizure* 14 (2005): 367-370.
7. Lobefalo L, Rapinese M, Altobelli E, et al. Retinal nerve fiber layer and macular thickness in adolescents with epilepsy treated with valproate and carbamazepine. *Epilepsia* 47 (2006): 717-719.
8. Farabi Y, Adib Moghaddam S, Naser M. Recording of Visual Evoked Potential in Patients Suffering from Epilepsy following Valproate Sodium Treatment. *Journal of Ophthalmology and Research* 2 (2019): 006-009.
9. Verrotti A, Lobefalo L, Priolo T, et al. Color vision in epileptic adolescents treated with valproate and carbamazepine. *Seizure* 13 (2004): 411-417.

**Citation:** Hayani M, wandarian K. Effect of Valproic Acid on Retina. *Journal of Ophthalmology and Research* 2 (2019): 023-025.



This article is an open access article distributed under the terms and conditions of the [Creative Commons Attribution \(CC-BY\) license 4.0](https://creativecommons.org/licenses/by/4.0/)