



## RECORDING OF ELECTROOCULOGRAPHY IN EPILEPTIC PATIENTS WITH SODIUM VALPROATE TREATMENT

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### ABSTRACT

**Aim:** Valproate Sodium is a medication used to treat symptoms of epileptic patients. This drug is having certain side effects on visual system. The purpose of this research is to check the visual system, mainly retina of these patients using electrooculography (EOG).

**Method:** Thirty epileptic patients prescribed for sodium valproate treatment were selected for the purpose of present study. EOG was recorded in total population. Arden index (AI) was measured in patients group. Same procedure was repeated for the normal group. The results obtained in two groups were compared to check for statistically difference in two groups.

**Results:** The two group's i. e. case and control were matched demographically from age, sex and visual acuity point of view. The AI was  $2.26 \pm 0.62$  and  $2.18 \pm 0.59$  in case and control groups respectively. The difference between two groups was not statistically significant ( $P > 0.05$ ).

**Conclusion:** From the results of present study it can be concluded that valproate sodium affect the retinal pigment epithelium layer of retina which can be proved by electrooculography.

**KEYWORDS :** Epilepsy, Sodium Valproate, Retinal Pigment Epithelium, Electrooculography.

### INTRODUCTION

Epilepsy is a chronic disorder the hallmark of which is recurrent unprovoked seizures. The seizures in epilepsy may be related to a brain injury or a family tendency. Although the symptoms of seizures may affect any part of the body, the electrical events that produce the symptoms occur in the brain. The location of the event, how it spreads, how much of the brain is affected, and how long it lasts all have profound effects. These factors determine the character of a seizures and its impact on the individual.

Valproate Sodium is a medication used to treat epilepsy. This drug can be given intravenously or by mouth valproate sodium have common side effects including nausea, vomiting and dry mouth.

Visual disturbances are common side-effect of sodium valproate. color perception is also reported as side effect of sodium valproate on visual system too.

Sodium valproate may affect central nervous system. The following review is useful in this connection, Segura- Bruna, N and his colleagues reported that valproate induces hyperammonemic encephalopathy (1).

Visual pathway is a part of central nervous system that can be accordingly affected due to this drug.

There are different techniques to examine the visual pathway. One of the efficient technique is the electrophysiology of vision..It comprises visual evoked potential (VEP), electroretinography (ERG) and electrooculography (EOG).

These techniques may be used to examine the pathological conditions of visual system.

Tahmasebi S and her colleagues on 2014 compared the electroretinographical patterns in retinitis pigmentosa and chloroquine consuming patients to look for different site of retina which gets affected in these conditions (2).

Another work in this connection was done to examine the visual pathway disturbances of the migraines patients using proper stimulating technique, and they resulted that pattern reversal checker board VEP is an efficient technique for this purpose (3).

Shusstarian S M and his colleagues on 2014 worked on electroretinographical changes in multiple sclerosis (MS) patients with abnormal visual evoked potentials and they concluded that in MS patients retina is also affected in addition to visual pathway disturbances (4).

Electrophysiological technique of vision can be used to examine the toxic effect of drugs on visual system.

Naser M and her research team worked on toxic effect of Depakine on retina of epileptic patients using electroretinogram, but the concluded that ERG was normal in depakine consuming patient hence retina of these patients are intact (5).

Finally a case study was reported to examine the visual disturbances in a patient with Amiodarone treatment following refractive surgery. The authors used VEP, ERG and EOG techniques in the patients and find out that these tests are abnormal in the patient. The patient complains from sensing a ring around the light. The symptom recovered after amiodarone termination (6).

Base on above literature survey a research was planned out to check to toxicity of valproate sodium on retina using EOG.

### MATERIAL & METHOD

Thirty patients suffering from epilepsy were selected for the purpose of present study. The age range of patients was 20-30 years. They were having both the sexes' i. e. male and female. The patients were under sodium valproate treatment for at least 1 year. The visual acuity of the patients was 10/10 or other wise could be corrected by suitable lenses. The patients under gone electrooculography (EOG) test. Mangoni machine capable of recording VEP, ERG and EOG was used for this purpose. To record EOG, the subjects were asked to look at Three bulbs simultaneously which are fixed on the instrument. The two extreme bulbs made an angle of  $30^\circ$  with the eyes of the patients.

For this purpose the eye was kept in total dark condition for ten minutes, then the test bulbs were switched on and the subject was asked to rotate the eye to and fro between the right & left bulbs for ten minutes. Corresponding potential changes were measured. The difference in readings obtained by focusing the eye toward left & right bulbs was measured. Mean of the readings was calculated. This reading is the dark adaptation potential.

Finally the subject was kept in room light for ten minutes (light adaptation). The same procedure was followed again i.e. the eye was rotated over same angle & the changes in potential was measured. Mean is calculated. This reading is light adaptation potential. The ratio of mean light adaptation to mean dark adaptation was obtained which is Arden Index (AI). The AI was recorded in case & control groups. The results obtained were compared to search for possible changes in two groups.

**RESULTS:**

Two groups of subjects were selected. The epileptic patients were taken as a case group and normal population with healthy visual system as a control group. The groups were demographically matched as for as sex, age and visual acuity was concerned.

Electrooculography (EOG) was examined in two groups. The Arden Index was  $2.26 \pm 0.62$  and  $2.18 \pm 0.59$  in case and control groups respectively.

**DISCUSSION:**

Two groups of subjects were selected. The Two groups were matched demographically i.e. from sex, age and visual acuity point of view.

One of the groups i.e. case were among the patients consuming sodium valproate because of epileptic problem but other one were among the normal population with normal visual system without sodium valproate treatment. It was found that AI was  $2.26 \pm 0.62$  and  $2.18 \pm 0.59$  in case and control groups respectively. The difference between two groups was not statistically significant.

It is a well known fact that EOG with AI originate from retinal pigment epithelium layer so this layer does not deteriorated in this patients. In fact the authors could not find the related research in this area. The only research which may be related to some extent is the work of Naser M and her colleague on 2014. They worked on effect of depakine on retina of epileptic patients using electroretinogram. They worked on 50 epileptic subjects treated with depakine and used to screen their retinal layers by electroretinography (ERG). The ERG in these patients was normal and there by no retinal changes in these patients (5). It is true that in this study the technique is different but to some extent can support the result of present work because the retina remain intact in those patients and in present work also we get intact retinal layer i.e. retinal pigment epithelium.

**CONCLUSION:**

From the result of present work one can conclude that the retinal pigment epithelium does not affect in sodium valproate consuming patients which can be proved by electrooculography.

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