Case Report

Visual Evoked Potential Recording in a Fatigued and Drowsy Patient under Anti-Seizure Medicine Treatment

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Abstract:

The visual evoked potential is an electrophysiological technique to screen visual pathway disturbances. A quite fatigued and drowsy patient due to anti-epileptic drug therapy suffering from diplopia was tested for visual evoked potential with pattern reversal stimulation. The result was not reliable; thus, flash stimulation was applied. The optimal result was obtained considering both types of stimulations.
Keywords: Visual Evoked Potential; Seizure; Anti-Seizure Drugs.

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Introduction

A seizure is a sudden, uncontrolled electrical disturbance in the brain. It can lead to altered behavior, movements, feeling, and levels of consciousness. Two or more episodes of unprovoked seizures at least 24 hours apart are considered epilepsy. Carbamazepine, Valproic acid, Oxcarbazepine, Gabapentin, and Phenobarbital are among the drugs used to treat seizures and epilepsy. Side effects of anti-seizure drugs include headache, drowsiness, dizziness, and blurred or double vision.

Visual evoked potential (VEP) is an electrophysiological technique used in patients with diplopia or blurred vision and headache to examine physiological and pathological conditions.

Shushtarian, SM. et al. (1999) investigated female subjects' VEP changes during menstrual cycles. They used pattern reversal checkerboard and flash stimulation techniques and concluded that flash stimulation indicates more alterations during the menstrual cycles than pattern reversal stimulation [1].

In another study in 2018, Shushtarian et al. assessed the pathological changes observed in the visual pathway of the laborers exposed to occupation vibration in a textile factory [2].

Finally, many research studies have been conducted on using VEP for different pathological conditions [3-8]. VEP is also used to assess the toxic effects of certain drugs on the visual pathway.

Allahdady, F.et al. (2016) studied the sensitivity of VEP in the early detection of hydroxychloroquine (HCQ) retinal toxicity and showed that VEP is a suitable technique for this purpose [9].

In a case report in 2020, the toxic effect of Amiodarone on the visual pathway was reported using VEP examination. It showed higher VEP, P100 latency in a patient compared to healthy individuals [10].

Based on the literature review, the utility of VEP using pattern reversal checkerboard and flash techniques was applied on a patient with various anti-seizure drug treatments to assess the visual pathway of the patients for probable toxic effects of the medications on the visual pathway and find the optimum visual stimulator.

Case report

A 25 years patient was referred to Basir clinic for VEP examination. He was looking fatigued and drowsy, looking like an addict. The medical history of the patient shows he has severe epilepsy and thereby the patient received anti-convulsive drugs for quite a long time. The consulting neurologist prescribed different medications, including Sodium Valproate and Carbamazepine. The patient complained of diplopia and could hardly control himself.

VEP using pattern reversal stimulation was used to record the VEP of the patient. He could distinguish the fixation point on the monitor. His visual acuity was good enough to use a pattern reversal checkerboard to record VEP, but the VEP pattern obtained was quite variable in each recording. Noticing that the patient could not concentrate, the operator decided to perform VEP with flash stimulation to obtain an accurate result. The situation was so severe that he used to open the patient's eyes during the flash VEP recording. Finally, the operator could reach an optimum result by putting both types of VEP, pattern, and flash.

Discussion

A 25-years old patient suffering from recurrent seizures with a history of several anti-seizure drugs was referred to Basir clinic for VEP

examination due to diplopia and blurred vision. He could hardly control himself due to the influence of the anti-seizure drugs. He was tested for VEP using a pattern reversal checkerboard, but the result was unreliable despite his suitable visual acuity, so the flash VEP was performed to obtain reliable results. Finally, using both types of stimulation, a delay in VEP, P100 latency was diagnosed in the left eye.

Suitable stimulation techniques to record VEP in migraine patients were investigated in 2020. Twenty migraine patients aged 20-30 years and 10/10 visual acuity were selected for this purpose. It was concluded that a pattern reversal checkerboard should be used in the patient group; however, they finally stated that in some cases, using flash stimulation is unavoidable [11].

In Shushtarian S.M. et al.'s study (2017), a reported case suffered from severe headaches initiated by flash VEP recording. He was suffering from monocular optic neuritis and a history of migraine headaches [12], showing the importance of the stimulator in recording VEP. Naser M et al. (2014) extensively researched 75 migraineurs. They recorded visual evoked potential using two types of visual stimulators, pattern reversal checkerboard and flash; they found an increased delay in latency of VEP, P100, in the case of flash rather than pattern stimulator in the patients [13].

Finally, a study (2008) showed that in patients with multiple sclerosis, flash VEP shows larger latency of VEP, P100 peak rather than pattern VEP [14].

Conclusion

In drowsy and fatigued patients, both types of visual stimulators, pattern reversal and flash, should be used to record visual evoked potential to reach a reliable result.

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