

A study of role of VEP in traumatic optic neuropathy

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Abstract

Traumatic optic neuropathy (TON) is one of the devastating complications of head injury. It is noted in 0.5 to 3% of head injuries. Totally 100 patients were included in this study. In this study, VEP was done using pattern reversal technique. After resuscitating the patients for head injury, preintervention VEP was taken. In this study, patients with abnormal waves showed significant improvement in vision. Patients who had absent waves in VEP showed poor recovery in vision

Key Words; improvement in vision, traumatic optic neuropathy, visually evoked potential.

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OBJECTIVES

Role of VEP in TON

MATERIAL AND METHODS

Nature of study: Prospective study

Total cases studied: 100

Place of study: Head injury ward, Institute of Ophthalmology, Rajiv Gandhi Government General Hospital, Chennai.

Time of study: August 2013 to March 2016

In this study, VEP was done using pattern reversal technique. After resuscitating the patients for head injury, preintervention VEP was taken¹.

OBSERVATION AND RESULTS:

(a) In this study, patients with abnormal waves showed significant improvement in vision. This shows that those with minimal physiological activity in VEP will have chance for recovery.

(b) Patients who had absent waves in VEP showed poor recovery in vision

DISCUSSION

Visual evoked potentials is a very good indicator of the integrity of visual pathway.² Till the 1980s VEP was not used in optic nerve injury patients.³ Shaked *et al* in 1982, reported a case and highlighted the importance of VEP in

INTRODUCTION

VEP represented the cortical response to light stimulus. VEP results can be categorized into normal, abnormal or absent depending upon their wave formation, amplitude and latencies. Latencies longer than 2 Standard Deviation of the control were considered as abnormal. VEPs are routinely done within 48hrs of initial evaluation and test is repeated within 10 days to assess the improvement. Light emitting diode visual evoked potentials is used in unconscious patients

AIMS

1. To study optic nerve injury in mild and moderate head injury patients admitted in the head injury ward, Rajiv Gandhi Government General Hospital.
2. To study the pre intervention VEP

traumatic optic neuropathy. Nau *et al*, in 1987 reported poor outcome in patients having no waves. Mahapatra *et al* and Tandon *et al* repeatedly showed better visual recovery in patients with abnormal or normal VEPs. They also showed that patients with repeated absent waves had no visual recovery.^{2,4} VEP represented the cortical response to light stimulus.⁴ VEP results can be categorized into normal, abnormal or absent depending upon their wave formation, amplitude and latencies. Latencies longer than 2 Standard Deviation of the control were considered as abnormal. VEPs are routinely done within 48hrs of initial evaluation and test is repeated within 10 days to assess the improvement. Light emitting diode visual evoked potentials is used in unconscious patients. Patient who are showing repeated absent waves in VEP studies, will not improve after surgical decompression.^{2,4} There are two types of VEP technique as follows: (i) Pattern Reversal Technique. More sensitive and reliable test for testing optic nerve injury is pattern reversal stimulus technique⁵. The patient should focus on high-contrast checkerboard of black and white squares which displayed on a video or optical projection screen. The stimulus is the change of black squares to white and of white squares to black, So this technique called as Pattern reversal technique. The VEP is generated from foveal and parafoveal elements when appropriate stimulus were used. When monocular fullfield stimulation is used, test will be more sensitive to identify lesions of optic nerve anterior to the chiasm. The primary basis for interpretation of the VEP is measurement of the latency of the P100 component after stimulation of each eye separately. After the absolute P100 latency for each eye is measured, the intereye P100 latency difference is determined. Comparison of these values with normative laboratory data will indicate the normal or abnormal nature of the response. Because optic nerve fibers from the temporal retina decussate at the chiasm, unilateral prolongation of P100 latency after full-field monocular

stimulation implies an abnormality anterior to the optic chiasm on that side. Bilateral lesions either anterior or posterior to the optic chiasm or a chiasmal lesion will cause bilateral delay of the P100, demonstrated by separate stimulation of each eye⁶. (ii) Flash VEP ; Flash VEP is nowadays routinely used in tertiary centers. Visual flashes are delivered by means of light emitting diode goggles, placed over the eyes. Even in unconscious patients, visual status can be assessed by using this technique. But in unconscious patient, one could only state whether the optic nerve is injured or not.

CONCLUSION

In this study, patients with abnormal waves showed significant improvement in vision. This shows that those with minimal physiological activity in VEP will have chance for recovery. Patients who had absent waves in VEP showed poor recovery in vision

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