ABSTRACT

AN OBSERVATIONAL STUDY TO EVALUATE THE ROLE OF VISUAL EVOKED POTENTIAL IN INDIRECT TRAUMATIC OPTIC NERVE INJURIES AND ASSESSMENT OF THE VISUAL OUTCOME

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KEYWORDS: RELATIVE AFFERENT PUPILLARY DEFECT (RAPD), VISUAL EVOKED POTENTIAL (VEP), INDIRECT OPTIC NERVE INJURY, TRAUMATIC OPTIC NEURITIS TREATMENT TRIAL.
BACKGROUND OF THE STUDY:
Hippocrates noted blows to the eyebrow may cause blindness known as optic neuropathy. Optic neuropathy is a potential complication of head or orbital trauma, results in direct or indirect optic nerve injuries. Most common form of traumatic optic neuropathy is indirect damage to the optic nerve. Incidence 0.5% to 5% of all closed head trauma which is a consequence of Road traffic accidents or falls. The incidence of optic nerve injury in severe head injury 13%. The site of injury causing blindness is usually forehead or supraorbital ridge less commonly temporal region. Indirect traumatic optic nerve injuries produced by energy absorbed by the nerve, without disruption of normal anatomical structures.

AIMS AND OBJECTIVES OF THE STUDY:
To evaluate the role of visual evoked potential in patients with indirect optic nerve injuries.
To study about the following factors in patients with indirect traumatic optic nerve injuries and assessment of final visual outcome
• Visual acuity at the time of presentation
• Pupillary examination - RAPD
• Visual evoked potential (VEP)
• Color vision defect and types.
• Field defect at presentation
• Fundus examination

MATERIALS AND METHODS:
Prospective, observational study to detect the subclinical findings in indirect traumatic optic nerve injury patients using visual evoked potential and to start immediate treatment for better final visual outcome.

PROCEDURE:
Patients satisfying both inclusion and exclusion criteria are selected. Explain about the study and procedure and get informed consent.

i. Initial Visual acuity is recorded by Snellen’s chart.

ii. Anterior segment examination by torch light and slit lamp biomicroscopy.

iii. Pupillary examination (both direct, consensual and swinging flash light test) by pupilloscope.

iv. VEP be performed in sitting position.

v. Colour vision tested by psuedoisochromaticishihara’s color vision chart

vi. Visual fields by Bjerrum’s method.

vii. Tension by Schiotz’s tonometer

viii. Fundoscopy by direct ophthalmoscope or by using +90D lens with slit lamp are recorded.

ix. Patients are treated with drug.

**RESULTS:**

Indirect traumatic optic neuropathy is due to closed head trauma which results in transmission of force from forehead to the optic nerve in the optic canal or in the intracranial portion. It causes severe visual morbidity in the form of visual loss, RAPD, Colour vision defects, field defects and changes in visually evoked potential. In our study clinical diagnosis made by pupillary examination was confirmed by visual evoked potential (VEP). VEP also quantifies the optic nerve dysfunction and predicts the prognosis earlier. The average age of the patient is 30 years and ranges from 19-42 years. The gender ratio of male:female was 3:1. The higher male preponderance here was due to the fact that RTA, which is the commonest cause of optic nerve injury, occurs more in males. Here almost 75% of patients had right eye involvement which was also statistically significant.
As expected, road traffic accidents (RTAs) were the commonest cause of indirect traumatic optic nerve injury amongst which bike accidents were the most common. Fall from height being the next most common cause of this catastrophe. The mean duration between admission and initiation of treatment after trauma was 7.4 hours (Range-7-8 hours). The initial visual acuity ranged from NLP to 6/36. All patients in our study showed presence of RAPD. Presence of orbital fracture in CT scan did not influence the final visual outcome. Severe delay in P2 represents confirmation of optic nerve injury. Absence of VEP response indicates poor visual prognosis.

**CONCLUSION:**

Visual Evoked potential is a valuable clinical tool to confirm indirect optic nerve injury and to predict the visual prognosis following treatment. RAPD grades showed correlation with the results of Visual Evoked Potential.