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# Screening of Visual Pathway in Patients Suffering from Guillain Barre by Visual Evoked Potential

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## Abstract

**Aim:** Guillain-Barre syndrome (GBS) is a rare condition in which a person's immune system attacks the peripheral nerve. The visual system can also be affected in GBS patients. The aim of present work is to look for visual pathway, disturbances in these patients using visual evoked potential (VEP).

**Material and Methods:** 10 male patients (20 eyes) diagnosed as GBS in age range of 25 to 56 years were selected for the purpose of present study. Visual evoked potential (VEP) using pattern type of stimulation was tested in total patient group using Mangoni machine. The results obtained was compared with 10 normal sex and age matched population following VEP test.

**Results:** There was not statistically significant differences as far as demographical finding was concerned between case and control groups.

There was a significant difference was observed in latency and amplitude of VEP, P100 Peak between case and control groups ($P<0.001$ for both parameters).

**Conclusion**: Guillain barre syndrome can affects the visual pathway of visual system which can be measured by VEP.

**Keywords**: Guillain- bare syndrome; visual pathway; visual evoked potential

## Introduction

Guillain-Barre syndrome (GBS) is a rare autoimmune-mediated peripheral neuropathy with an acute onset. GBS is associated with posterior cranical nerve injury including the facial, oculomotor, glossopharyngeal and vagus nerve. Many parts of the body including visual system can be affected in these patients. Electrophysiological techniques of the vision are used to assess different pathological conditions of visual system, mainly the retina and visual pathway. Electroretinography (ERG), electrooculography (EOG) and visual evoked potential (VEP) are commonly employed electrophysiological techniques used in this field.

Abdolalizadeh S et al (2022) conducted A study to investigate the potential effects of antiseizure medication on patients using ERG. The study included twenty participants consisting of ten males and ten females, ranging in age from 15 to 30 years. The findings revealed retinal changes in these patients which were diagnosed by measuring the amplitude of ERG, specifically b-wave peak [1]. The same research team also examined the retinal pigment epithelium (RPE) of patients undergoing treatment with anti-epileptic medication using EOG. They utilized the same group of patients and observed pathological changes in the RPE, which were identified by assessing the Arden Index (AI) of EOG test [2]. Shushtarian S M et al (2017) designed a study to investigate the potential effects of vibration on the visual pathway using VEP. They selected 50 workers from a textile factory segment where machinery creating high level of vibration. The study concluded that occupational vibration had adverse effects on the visual pathway, leading to increased latency of VEP, specifically the P100 Peak [3]. Numerous references have been published on this topic [4-47]. In present study we utilized VEP to screen the visual pathway of the patients who had suffered from GBS.

## Material and Methods

In a case control study, we selected 10 male patients (20 eyes) with GBS as the case group. The patients in the case group were within the age range of 30-65 years. VEP test was examined in total case group. For stimulating the eyes of patient's pattern reversal checkboard was used. Latency (*msec*) and amplitude (*uv*) of VEP, P100 Peak was measured. As a comparison group, we selected 10 healthy subjects (visual pathway) of same age and sex of case group, as a control group. For recording VEP in both the group we used to connect the total population to the recording machine, i.e., active, reference and earth were attached to occipital region, vertex and forehead respectively. The setup was designed to ensure accurate and reliable measurements during VEP procedure.

## Results

Table 1, Comparison of the mean age in the case and control groups. There were no statistically significant differences between the two groups in terms of age (P=0.492). and sex (all participants were male).

**Table 1:** Demographical finding in case and control groups

| Variable | Number of participants | groups (Mean ± SD) | | P value* |
|---|---|---|---|---|
| | | Control | Case | |
| Age | 10 (20 eyes) | 45.61 ± 6.8 | 45.72 ± 7.12 | 0.492 |

*Based on Mann-Whitney Test

Table 2 presents a comparison of latency and amplitude measurements for the VEP P100 peak between the case and control groups. It was observed that the case group had a statistically higher latency (P <0.001) and lower amplitude for the VEP P100 Peak (P<0.001) compared to control group.

**Table 2:** Comparison of mean latency and amplitude measurements of VEP, P100 peak in the case and control groups

| Variable | Number of participants | groups (Mean ± SD) | | P value* |
|---|---|---|---|---|
| | | Control | Case | |
| Latency (msec) | 10 | 97.46 ± 2.8 | 108.92 ± 3.84 | 0.000 |
| Amplitude (μv) | 10 | 6.38 ± 1.6 | 2.96 ± 1.12 | 0.000 |

* Based on Mann-Whitney Test

## Discussion

Guillain-Barre syndrome (GBS) can damage the visual pathway of the patients which can be measured by latency and amplitude of VEP, P100 Peak. It is a fact that VEP is a suitable technique to screen the visual pathway [48-50].

The findings of present work may be supported by following research work.

Güngor L et al(2011) worked on 32 patients with diagnosis of GBS. They recorded VEP in total patient group. In their work only five cases (16%) had abnormal VEPs, i.e., mainly increase in latency [51] of VEP, P100 Peak. Zgorzalewicz H et al (2004) performed an extensive research work on VEP in children and adolescents with GBS. They found a few patients had abnormal VEP with prolongation of latency of VEP, P100 Peak with changes of amplitude of same peak [52].

These two works support the findings of present work to some extent however in two mentioned work a few GBS had abnormal VEP where as in our work maximum number of patients had abnormal VEP's. The reason for this difference lies in the fact that the other research workers used random patients where as we consider the GBS patients who referred for VEP test with probability of visual pathway deficits.

## Conclusion

Guillain- Barre syndrome can affect the visual pathway of human visual system and can be measured by latency and amplitude of visual evoked potential P100 Peak.

## Conflict of Interest

The authors have no conflict of interest with the subject matter of this manuscript

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