

Case Report

Accidental Exposure of a Worker's Eyes to Hydrochloric Acid Leading to Total Binocular Blindness

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Abstract

A 62 years old male patient was referred to Basir eye clinic for visual evoked potential measurement. The result was flat VEP, P₁₀₀ latency and amplitude in both of his eyes. He was an installation worker who was exposed to hydrochloric acid (HCl) in both of his eyes. He went corneal transplantation, but the result was negative. We performed VEP which indicated visual pathway involvement.

Keywords: Hydrochloric Acid; Blindness; Accidental.

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Introduction

Occupational hazards in working environment may cause certain unexpected damage to human organs like the visual system.

Shushtarian et al.,¹ worked on 50 workers of a turner factory. They were exposed to intraocular foreign bodies (IOFB). They checked the effect of IOFB on visual system of these workers, mainly on retina. Electoretinography was used for their purpose. The result of their work was pathological changes of electoretinography (ERG) or wave parameters including amplitude and latency. They concluded that ERG is a suitable technique to look for retinal changes.

The same author studied the effect of occupational vibration on visual pathway of 50 workers of a textile factory. They used visual evoked potential (VEP) technique for this purpose. The result of their work was significant delay in latency of VEP. They concluded that visual pathway of laborers working in textile factory might be affected by vibration as indicated by VEP technique².

Shushtarian et al.,³ also studied VEP among patients with chronic mustard gas exposure. They worked on 150 participants in three groups, one case and two control group. The cases were the war veterans exposed to chemical war weapon during the Iran-Iraq war. The conclusion of their work was visual pathway disturbances in war veterans, which was proved by latency delay of VEP, P_{100} peak. Here we report a case of a patient who was accidentally exposed to HCl. He was referred to our clinic because the treatment was unsuccessful and the patient only achieved light perception.

Case report:

A 62 years old male patient was referred to

Basir eye clinic for recording of visual evoked potential (VEP). He only had light perception (LP). We used the flash type of VEP stimulation to check the patient's visual pathway. No VEP, P_{100} peak was obtained, which indicated severe visual pathway involvement in both eyes. The history of patients showed that the patients both eyes were exposed to accidental HCl solution in his working environment. The patient was managed for corneal burn by ophthalmologists in emergency section of an eye hospital. Then due to achieving just light perception after treatment he was referred to our clinic for further examination. We also found after taking the patient's history that there was a long delay between the chemical exposure and the treatment by the ophthalmologist.

Discussion

Corneal burn due to acid exposure in working environment is rare and might even lead to blindness in very rare cases. Here we introduce a patient a 62 years old patient who was exposed to HCl which led to severe visual impairment.

Sarzaeim et al.,⁴ have reported 10 patients (20 eyes) who suffered from head trauma. They used flash VEP because of lack of visual acuity in the patient group. The result of their work was significant delay in latency VEP, P_{100} peak in patient group which might indicate visual pathway impairment in the case group.

Ameli et al.,⁵ studied research VEP changes in patients suffering from brain stroke. They used flash type of stimulation for recording VEP because their patients could not distinguish the monitor which was necessary for pattern reversal VEP. Their reported pathological changes of VEP, P_{100} parameters including latency and amplitude, which it might be an indication of visual pathway disturbances in

these patients.

Similarly, we found VEP disturbances in our patient which is indication that if the eye burn by chemicals is not treated in time it might lead to sever eye sight impairment.

Conclusion

Our case indicates that if work place chemical accidents are not treated in time, they might lead to sever eye sight impairment.

Conflict of Interest

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

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References:

1. Shushtarian SM, Mirdehghan MS, Valiollahi P. Retinal damages in turner workers of a factory exposed to intraocular foreign bodies. *Indian Journal of Occupational and Environmental Medicine*.2008;12(3):136-8.
2. Shushtarian S, Kalantari AS, Tajik F, Adhami-Moghadam F. Effect of occupational vibration on visual pathway measured by visual evoked potentials. *Journal of Ophthalmic and Optometric Sciences*.2017;1(5):7-11.
3. Shushtarian SMM, Shojaei A, Adhami-Moghadam F. Visual Evoked Potentials Changes among Patients with Chronic Mustard Gas Exposure. *Journal of Ophthalmic and Optometric Sciences*.2018;2:6-9.
4. Sarzaeim F, Hashemzahi M, Shushtarian SM, Shojaei A, Naghib J. Flash Visual Evoked Potential as a Suitable Technique to Evaluate the Extent of Injury to Visual Pathway Following Head Trauma. *Journal of Ophthalmology and Research*. 2022;5(1):20-3.
5. Ameli S, Shojaei A. Flash Visual Evoked Potential Recording in Patients with Brain Stroke. *Journal of Ophthalmology and Research*. 2023;6(3):40-4.