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Research Article

Using Visual Evoked Potential to Study the Effect of Methotrexate on Retina

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Abstract

Methotrexate is a drug generally used to treat some types of cancer or to control severe psoriasis or rheumatoid arthritis that has not responded to other treatments. Methotrexate belongs to a class of drugs known as antimetabolites. It works by suppressing the immune system. Common side effects of this drug may include fever, chills, tiredness, mouth sores; nausea, upset stomach, dizziness. The aim of this research is to check if this drug has a probable toxic effect on retina. It is a case control study with 16 patients taking Methotrexate for more than one year and 16 healthy population without using the drug. Visual evoked potential (VEP) was recorded, Latency and amplitude of P100 peak was measured in all 32 subjects. Mean and standard deviation were calculated for each group. The mean latencies /SD and amplitudes /SD of VEP, P100 obtained in two groups compared together. There was no statistically significant difference between two groups. Based on the result, we can conclude that visual pathway is not affected in patients taking Methotrexate.

Keywords: Methotrexate; Retina; Visual evoked potential

1. Introduction

Methotrexate (MTX) is a derivate of folic acid, commonly used for the treatment and management of malignant diseases and autoimmune disorders [1]. It acts by inhibiting the metabolism of folic acid. Methotrexate can be taken orally or administered by injection. MTX has certain side effects include hepatotoxicity, ulcerative stomatitis, nausea, abdominal pain, tiredness, fever, dizziness, kidney failure [2]. MTX may have side effects on visual system [5]. Visual evoked potential and Electroretinography are two common methods to diagnose the toxic effect of drugs on retina and check visual pathway [1-3]. The visual evoked potential (VEP) is a measurement of the electrical signal recorded at the scalp over the occipital cortex in response to light stimulus [4]. Any abnormality that affects

the visual pathways or visual cortex of brain such as meningitis, optic neuritis, can affect the VEP. In this study, we used VEP technique to check the effect of MTX on retina.

2. Method

We included 16 patients under methotrexate treatment for the purpose of this work. All patients were taking oral methotrexate 2.5 mg three times per week for more than a year. The patients were tested for visual evoked potential. To record VEP, the pattern reversal checker board was selected to stimulate the eyes of the patients according to standard ISCEV protocol. Latency and amplitude of VEP, P100 peaks were measured for all patients. The same procedure was repeated for control group of 16 healthy population as far as visual system was concerned. The case and control were matched as far as sex and age was concerned. The results obtained in two groups were compared together. SPSS was used for studying on the statistical relation between two groups.

3. Results

The mean latency and amplitude of VEP, P100 peak in case group was 89.16/18.15 and 4.4/2.21 whereas 90.52/10.21 and 4.8/1.31 in the control group.

4. Discussion

Result of the study shows that there is no significant difference between parameters of VEP between two groups which indicates that taking Methotrexate can not affect in visual pathway. The study done by Cavaqna L, reported inefficacy of visual evoked potential in early detection of hydroxychloroquine retinopathy, which supports the result of this study [5]. Glare G, et al. reported a case of bilateral optic neuropathy in a middle aged woman taking methotrexate medication which is contrast with the result of our work [6].

5. Conclusion

Based on the result of this study by using VEP, it can be concluded that Methotrexate is a safe drug as far as visual pathway is concerned and has no serious side effect on the retina in patients taking this drug. Although, more studies need to be done to support this finding.

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