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To study the effects of carbamazepine and levetiracetam on vitamin D concentration

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Background: Epilepsy is a common neurological disorder affecting all age groups. It is a syndrome of different cerebral disorders of CNS which is characterized by excessive discharge of large number of neurons. Carbamazepine is a first-generation enzyme-inducing Anti-Epileptic Drug (AEDs), while Levetiracetam (LEV) is a second new generation non-enzyme-inducing AEDs. Many studies show that epilepsy and some AEDs may affect the level of vitamin D in the body and that AEDs may affect the liver of the patients. The quality of life is found to be reduced in patients with epilepsy.

Aim of the study: To study the effects of carbamazepine and levetiracetam on vitamin D concentration, liver enzymes Alanine Aminotransferase (ALT), Aspartate Aminotransferase (AST), Serum Alkaline Phosphatase (ALP) and albumin in epileptic patients and to study the effects of vitamin D administration on the quality of life of the patients.

Patients and methods: This study has included 67 newly diagnosed epileptic patients receiving AEDs (CBZ and LEV) for 6 months. The patients have been separated into two groups according to the type of anti-epileptic drug used, 31 patients for the carbamazepine group and 36 patients for the LEV group. Another group which is included in the study is the control group consisting of 30 healthy subjects. The method and the purpose of the study have been explained to the patients and their approval and ethical approval has been obtained at the start of the study. Serum liver enzymes, Alanine Aminotransferase (ALT), Aspartate Aminotransferase (AST), Alkaline Phosphatase (ALP), serum albumin, Serum vitamin D and calcium have been measured in patients. Quality of life in epilepsy (QOLIE-31) of all patients is calculated by using the QOLIE-31 questionnaire (version 1.0). Patients after 3 months of treatment are divided into 2 groups according to the basis of the vitamin D level of the patients into group A, 33 patients and group B, 34 patients. In this study, group a received vitamin D supplements based on their vitamin D levels, while group B does not.

Results: Serum liver enzymes AST, ALT and ALP have been determined. No patients developed clinical symptoms of liver disease. A significant elevation of the AST, ALT and ALP is noted in the carbamazepine group and a non-significant difference is noted in the LEV group. No significant differences are found at the start of the study between the carbamazepine group, LEV group and control group regarding vitamin D and calcium blood levels. Carbamazepine administration leads to decrease levels of vitamin D, while administration of LEV shows no effects on the levels of vitamin D. The addition of vitamin D to group A shows an increase in the % of improvement rate in quality of life as compared to group B, which does not receive vitamin D supplementation.

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Conclusion: This study shows the low effect of carbamazepine on vitamin D serum level, which may be due to its inducing properties. LEV reveals no effect on vitamin D serum levels. Also, the study shows significant elevation of liver enzymes due to CBZ administration and there is no clinical manifestation. This work also could provide evidence for the benefit action of vitamin D supplementation to patients with epilepsy through correction of the quality of life of the patients.

Biography

Waseem H. Alkhaffaf, he has been working as a Lecturer, Dept. of Medicine, College of Medicine, Ninevah University, Mosul, Iraq.

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