

The **hippocampus** is susceptible to **damage** in **patients** with **epilepsy** and in **animals** with **seizures** caused by excitotoxic agents. The effect of vitamin D on **hippocampal apoptosis** related with **seizures** has not been reported. However, epileptic patients have an increased risk of **hypovitaminosis D** which is most likely due to the effects of **antiepileptic drugs**. Therefore, in a study of Şahin et al., from **Trabzon**, it was aimed to evaluate the effects of **vitamin D** on hippocampal apoptosis related with **seizures** by using **pentylene-tetrazol** (PTZ) and **kainic acid** (KA) in **rats**.

Male **Sprague Dawley rats**, aged 5.5 weeks, were randomly divided into six groups: control, vitamin D, PTZ, KA, PTZ + vitamin D and KA + vitamin D groups. The groups that received vitamin D were given 500 IU/kg of vitamin D daily for two weeks in addition to a standard diet. At the end of this period, PTZ and KA were applied to trigger seizures in the rats in the seizure groups. 24 h after the administration of PTZ and KA, the rats were decapitated. In the **hippocampal region**, apoptosis was assessed by TUNEL and brain-derived neurotrophic factor (BDNF), Bax, caspase-3 and c-fos activation were evaluated by immunohistochemical method.

BDNF level increased while c-fos, Bax and caspase-3 levels decreased ( $p < 0.0001$ , in all) in the hippocampal neurons of the groups that were pre-treated with vitamin D before the administration of PTZ and KA, in comparison with the PTZ and KA groups. Vitamin D significantly decreased the number of apoptotic cells in these rats in comparison with the PTZ and KA groups ( $p < 0.0001$ ).

This study indicates that vitamin D has **neuroprotective** effects on hippocampal apoptosis induced by PTZ and KA in rats. With this study it is suggested that keeping vitamin D levels within normal limits may be beneficial for patients with epilepsy, especially children <sup>1)</sup>.

1)

Şahin S, Gürgeç SG, Yazar U, İnce İ, Kamaşak T, Acar Arslan E, Diler Durgut B, Dilber B, Cansu A. Vitamin D protects against hippocampal apoptosis related with seizures induced by kainic acid and pentylene-tetrazol in rats. *Epilepsy Res.* 2018 Dec 15;149:107-116. doi: 10.1016/j.eplesyres.2018.12.005. [Epub ahead of print] PubMed PMID: 30584976.

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