



Poster

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## Stereological investigation in the effects of curcumin on the phenobarbital caused hippocampal damage during development

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### ARTICLE INFO

### ABSTRACT

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Phenobarbital is an antiepileptic drug used for the treatment of seizures in newborns, children and adults. Despite having positive effect in the treatment of epilepsy, phenobarbital may adversely affect brain function and brain development. Antioxidant and neuroprotective properties of curcumin are well-known. Curcumin has a significant effect in the treatment of various diseases caused by oxidative stress. In the light of this information, the study aimed to determine the adverse effects of phenobarbital in the number of pyramidal cells in the hippocampus of the developing rat brain and whether curcumin has protective effects against these adverse effects. A total of 50 Wistar male rats were divided into two groups as 7 and 14-day old. Each group was subdivided into five groups as control, curcumin, dimethyl sulfoxide, phenobarbital, phenobarbital+curcumin. After dissolving in 10% dimethylsulfoxide, the rats in each group received intraperitoneal injection of phenobarbital (75 mg/kg) and curcumin (200 mg/kg). Rats were sacrificed 24 hours after the last injection. After histological processes, stereological analysis was performed using optical fractionation technique. Overall number of neurons in the left hippocampus of the 7 and 14-day old rats (CA1, CA2, CA3 and CA4) was estimated and average numerical values were determined. The mean total neuron numbers and standard deviations for 7-day old rats were  $727224 \pm 4531.7$  in control group;  $416111.5 \pm 29413.9$  in phenobarbital group and  $587136.5 \pm 36337.9$  in phenobarbital+curcumin group. These numerical values were  $508160.6 \pm 21985.2$ ;  $353817.6 \pm 24101.78$  and  $492470.9 \pm 36225$  for 14-day old rats respectively. Results showed that cellular damage in the hippocampus of developing rat brain (7-day and 14-day) caused by phenobarbital, also used in childhood epilepsy, can be prevented by curcumin, a powerful antioxidant. In the opinion, the results of this study will shed light on clinical studies and form a basis to antioxidant studies involving the use of phenobarbital.

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