

## Evaluation of effects of diclofenac on the proliferation and differentiation of PC12 cells in vitro

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### Abstract

**Background & Objective:** Diclofenac is a non-steroidal, anti-inflammatory drug that is prescribed as an analgesic. However, there is little known about the effects of diclofenac on the neural cells. In this study, we investigated the effects of diclofenac as sodium salt on the proliferation and differentiation of PC12 cells.

**Materials & Methods:** This experimental study was done in Kerman neuroscience research center during 2004. The cell proliferation was evaluated by using XTT assay in the both free-serum neurobasal medium supplemented with B27 supplement and DMEM/F12 medium containing 10% FBS. The nerve growth factor(NGF) – induced differentiation was assessed by measuring the neurite length for each treatment.

**Results:** The drug toxicity was exhibited at the higher concentrations of 310  $\mu$ M in the supplemented neurobasal medium. The treatment of cells in the DMEM/F12 medium increased their sensitivity to diclofenac, with 40 and 85% growth inhibition at the 155 and 310  $\mu$ M concentrations, respectively. The different generics of drug exhibited a equal toxic effects on the PC12 cells. The NGF- induced differentiation was not reduced by toxic and subtoxic concentrations of diclofenac.

**Conclusion:** This study indicated that diclofenac may be able to exhibit its neurotoxic effects through growth inhibition, but not differentiation inhibition. B27 supplement has several antioxidant compounds. Therefore, the difference of diclofenac cytotoxic effects in two culture media suggest that drug cytotoxicity may be related to the oxidative stress.

**Key Words:** Diclofenac, Cytotoxicity, Differentiation, NGF, PC12