

Role of Dopamine in Antiepileptic Action of Phenytoin

[Tanveer Ahmad Khan, Wali Mohommad Momin, AG Phadke](#)

Dr. Tanveer Khan. Professor and Head, Department of Pharmacology, Government Medical College, Rajnandgaon (C.G.).

Mob: 09423403782. Email: drtanveerkhan@yahoo.co.in

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Abstract

Objectives: Epilepsy is one of the serious potentially life shortening disorder of central nervous system which is not uncommon. Antiepileptic drug diphenylhydantoin (Phenytoin) is attributed to produce the anticonvulsant effect via dopamine. Hence this study was planned to observe the relationship between Phenytoin and dopamine modulators by experimentally induced seizures in rats. **Materials and Methods:** Albino rats were selected for maximal electroshock seizure (MES). After the screening, the rats were randomly included to constitute groups of 10. Minimum effective dose (ED_{min}) used for Phenytoin was 2.5 mg/kg while maximum effective dose (ED_{max}) was 25 mg/kg. Doses of Levodopa used were 100 mg/kg and 200 mg/kg while for Metoclopramide doses were 2 mg/kg, 20 mg/kg and 40 mg/kg. **Results:** In comparison to control group, the groups receiving dopaminergic antagonist Metoclopramide along with ED_{max} of Phenytoin sodium showed decreased protection as the dose of Metoclopramide increased. Phenytoin sodium in subanticonvulsant dose (ED_{min}) in control group did not show protection to a considerable degree against MES. But, when combined with a dopamine precursor Levodopa, the efficacy of ED_{min} of Phenytoin was increased. **Conclusion:** Dopamine has modulatory effect on antiepileptic action of Phenytoin. Among Dopamine receptors, activation of D2 receptors has seizure protective action. Modulation of D2 receptor might be involved in the antiepileptic action of Phenytoin.