



## Phenobarbital Pharmacological Findings on the Nerve-Muscle Basis

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**SUMMARY.** Phenobarbital and carbamazepine are antiepileptic drugs that act at the nervous central system by different mechanisms of action. In this work we investigated the pharmacological effects of these drugs on mouse phrenic nerve-diaphragm preparations through the myographic technique. Carbamazepine (0.105, 1.05, 2.1 and 4.2 mM, n = 8, 6, 6 and 6, respectively), induced a dose-dependent neuromuscular blockade, under indirect or direct muscle stimulation and the neurotransmission was reestablished after washing. Conversely, phenobarbital caused an unexpected facilitatory effect, under several formulations, such as the acid-extracted commercial tablets (1.05, 2.1 and 4.2 mM, n = 7, 6 and 7, respectively), commercial phenobarbital solution (4.2 mM, n = 7) or its correspondent pure active ingredient (4.2 and 2.1 mM, n = 6 each). Only at a higher concentration the acid-extracted phenobarbital performed a neuromuscular blockade (8.4 mM, n = 10). The different responses between carbamazepine (paralysis) and phenobarbital (facilitatory effect) evidenced a new effect for phenobarbital until now concealed at the neuromuscular junction and may involve the glutamatergic regulation, since its role as an acetylcholine co-transmitter in motoneurons was already established.

**KEY WORDS:** Antiepileptic drugs, Neuromuscular junction, Pharmacologic actions.

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