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Andrographis paniculata in Combating Eurotoxicity of *Naja naja* Venom: An *in-vitro* study

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BACKGROUND AND OBJECTIVES: Venom of the spectacled cobra, *Naja naja*, contains a potent neurotoxic enzyme, acetylcholine esterase (AChE), which contributes to respiratory paralysis causing death. *Andrographis paniculata* (AP), is an herb widely used in South Asia including India, for the treatment of cobra bite. The present *in-vitro* study investigates the effectiveness of the methanolic extract (MAP) of this herb, polyvalent anti-snake venom (ASV) and their combination in inhibiting the activity of acetylcholine esterase.

METHODS: AchE activity was assayed by Ellman's method. In group 1 experiments, N.N venom (100µg) was mixed with ASV (110 to 367µg) or MAP (100-400µg) or a combination of ASV (220µg) and MAP (100-200µg), following which AChE activity was estimated. In group 2 experiments, ASV or MAP were mixed with venom individually or in combination, incubated for 10 minutes to promote complex formation, after which AChE activity was estimated. The concentrations of all reactants in group II were same as those in group I. Corresponding controls were run for all the experiments.

RESULTS: *Group1*: ASV could inhibit AChE in the venom to the extent of 12-17%. MAP showed a higher (17-32%) inhibitory activity than ASV. A mixture of ASV and MAP inhibited AChE activity to a greater extent (36-44%), than when they were used individually. *Group 2*: When venom was incubated for 10 minutes with ASV, the inhibition of AChE activity was increased to 23-31%, with MAP up to 99% and with combination of ASV and MAP to 52 to 61%.

CONCLUSION: The results prove that MAP contains potent acetylcholine esterase inhibitory activity and is able to supplement the action of ASV. Incubation of the venom with either ASV or MAP or a combination of the two, improves their efficacy as anti-acetylcholine esterase agents.