5-2006

Anticonvulsant and Neuroprotective Effects of Ginsenosides in Rats (Abstract)

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Recommended Citation

Originally published in Epilepsy Research (2006) 70(2-3); pgs 244-256 DOI: http://dx.doi.org/10.1016/j.eplepsyres.2006.05.010
Subscribers may access full text here

Anticonvulsant and Neuroprotective Effects of Ginsenosides in Rats

Abstract

A partially purified extract from American ginseng has been shown to have anticonvulsant activity. To identify the active components in this extract, the activities of the individual ginsenosides (Rb_1, Rb_3 and Rd), mixtures of the purified ginsenosides and a newly prepared Rb fraction were determined. One hour after treatment with vehicle or one of the ginseng products, seizures were induced in adult, Sprague–Dawley rats with kainic acid (KA, 10 mg/kg), pilocarpine (300 mg/kg) or pentylenetetrazole (PTZ, 50 mg/kg i.p. or 90 mg/kg s.c.). Time to seizure onset, duration of seizure activity and seizure severity were determined. Weight change and neuronal damage were assessed 24 h after administration of KA or pilocarpine. Mixtures of purified Rb_1, Rb_3 with or without Rd had significant anticonvulsant effects in all three models of acutely induced seizures demonstrating that the ginsenosides are the active components in the Rb extract. The individual ginsenosides significantly increased the latency to onset of seizures after administration of kainic acid. Since no one individual ginsenoside accounted for the majority of the activity of the Rb extract, the results suggest that the most effective anticonvulsant product is a combination of ginsenosides. In addition, all of the ginseng products had significant neuroprotective activity beyond the reduction in seizure severity and duration.