Anticonvulsant effect of resveratrol in the conditions of acute corasol-induced seizures

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The incidence of seizure syndromes including those epilepsy associated actualizes the search of new anticonvulsants. The compounds of plant origin are of considerable interest in this respect. Such biologically active substances include resveratrol, which features the presence of a variety of positive biological effects. Resveratrol has antioxidant, cardioprotective, anti-cancer and neuroprotective properties. It was also shown that resveratrol can be used as the drug reducing the risk of chronic epilepsy. The objective of this study was to evaluate the effect of resveratrol on acute seizure activity induced by intravenous corasol administration.

To study the anticonvulsant effect, young male mice, weighing 18-20 g, CBA line kept in standard vivarium conditions, were used. All experiments were performed in accordance with international ethical norms accepted for the works with laboratory animals. The introduction of trans-resveratrol was carried out orally in a dose of 50, 100 and 200 mg/kg, dissolved in propylene glycol. The animals of control group received the same volume of pure propylene glycol. Acute seizure activity was induced by administration of 0.1% aqueous corasol solution in the tail vein 30, 90 and 120 minutes after the administration of resveratrol. The effect of the anticonvulsant action of resveratrol was assessed by the changes in minimum corasol dose causing clonic-tonic convulsions (DCTC) and tonic extension (DCE) in the experimental animals. Efficient corasol doses for experimental groups of animals are expressed in % of similar corasol doses causing clonic-tonic convulsions and tonic extensions in the control group. For animals of the control group, minimum efficient corasol doses (DCTC and DCE) were accepted as equal to 100%.

Resveratrol administration with about 30 minutes exposure increased in the same way DCTC and DCE parameters for all doses studied. Thus, DCTC was by 36-45% bigger and DCE by 41-56% bigger than the corresponding parameters in the control group of animals. When resveratrol is administered at 90 and 120 minutes, the most pronounced anticonvulsant effect was fixed for the dose of 200 mg/kg (DCTC - 188%, DCE - 195%). For the doses of 50 and 100 mg/kg at 90 and 120 minute exposure, the anticonvulsant effect was 12-25% lower than for the dose of 200 mg/kg. No significant differences in the anticonvulsant effect of resveratrol at 90 and 120 minute introduction have been identified for any of the doses studied.

The anticonvulsant effect of resveratrol observed 30 minutes after the administration was significantly lower than the effect in one hour and a half and two hours administration. This fact can be explained by the lag period prior to penetration of resveratrol in the structure of central nervous system. At the same time, no reliable differences in the pronouncement of the anticonvulsant effect of resveratrol for the administration of 90 and 120 minutes have been found, wherefrom one can conclude that 90 minutes are sufficient for the major part of resveratrol to enter into the central nervous system. In the most published thesis, resveratrol is used as a substance that potentiates the effect of the main anticonvulsant. We have demonstrated an independent anticonvulsant effect of resveratrol at the doses exceeding 50 mg/kg, for which reason we can recommend resveratrol as a prophylactic medication for seizure disorders.