Dehydroepiandrosterone sulfate is neuroprotective in a focal cortical cold lesion model

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Dehydroepiandrosterone and its sulfate (DHEAS) are sex hormone precursors. They may function as neurotrophic or neuroprotective factors to protect central nervous system neurons against a variety of insults, including excitotoxicity. The present study evaluated the effects of DHEAS and 17beta-estradiol (E2) in a focal cortical cold lesion model, in which DHEAS and equimolar E2 were administered either as pretreatment (two injections 1 d and 1 h before lesion induction) or as posttreatment (immediately after lesion induction). The focal cortical cold lesion was induced in the primary motor cortex by means of a cooled copper cylinder placed directly onto the cortical surface. One hour later, the animals were killed, the brains were cut into 0.4-mm-thick slices, and the sections were stained with 1% triphenyltetrazolium chloride. The volume of the hemispheric lesion was calculated for each animal. The results demonstrated that the lesion area was significantly attenuated in both the DHEAS- and E2- pre- and posttreated groups and that, in the presence of letrozole, a nonsteroidal aromatase inhibitor, no neuroprotection was observed, suggesting that the beneficial effect of DHEAS on the cold injury might depend on the conversion of DHEAS to E2 within the brain. It is concluded that even a single posttraumatic administration of DHEAS may be of substantial therapeutic benefit in the treatment of focal brain injury with vasogenic edema.

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