Abstract View

MELATONIN PRETREATMENT PROTECTS AGAINST FOCAL CEREBRAL ISCHEMIA IN THE RAT.

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Melatonin (MT) possesses many properties of an ideal neuroprotectant. In this study, the neuroprotective effects of exogenous MT were tested in a middle cerebral artery occlusion (MCAO) stroke model. Adult male Sprague-Dawley rats (280 to 360 g) were anesthetized with sodium pentobarbital (60 mg/kg, I.P.) to undergo reversible right-sided endovascular MCAO for 3 hours. Arterial blood pressure, heart rate and cerebral blood flow (CBF) were monitored, and rectal temperature was kept between 36.5 and 37.5 ºC throughout anesthesia. One I.P. dose of MT (at 1.5, 5, or 15 mg/kg) or the vehicle was given 30 minutes before onset of ischemia. The rats were decapitated on day 3 of MCAO, and their brains were stained with 2% triphenyltetrazolium chloride for determination of infarction. Results were compared using 2-tailed student's t test. When compared to the relative infarct volume of 31.8±3.3% (mean±SEM; 16 rats) in the control group, treatment with MT reduced the relative infarct volume in a dose-dependent manner (30.5±3.2% in the 1.5 mg/kg group [17 rats]; 15.9±2.2% in the 5 mg/kg group [16 rats], $P < 0.05$; 21.4±3.0% in the 15 mg/kg group [15 rats], $P < 0.05$). There was no significant difference in heart rate, arterial blood pressure and CBF among the groups. We concluded that a single dose of MT between 5 and 15 mg/kg protects against focal cerebral ischemia, when given 30 minutes before onset of ischemia. The above doses of MT do not produce significant hemodynamic effects nor alter the CBF during ischemia and reperfusion.

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