Protection effect of atorvastatin in cerebral ischemia-reperfusion injury rats by blocking the mitochondrial permeability transition pore

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ABSTRACT. The aim of this study was to investigate the influence of atorvastatin on the opening of the mitochondrial permeability transition pore (MPTP) and the expression of cytochrome C (Cyt C) in Sprague-Dawley rats with cerebral ischemia-reperfusion (I/R). The rat model of cerebral artery ischemia was established by the suture-occluded method with ischemia for 2 h and reperfusion for 72 h. Thirty-four male rats were randomly divided into four groups: the normal group and the sham-operation group without any treatment, the I/R group with only intragastric administration of normal saline, and the intervention group, which received intragastric administration of 10 mg/kg atorvastatin at different times. All rats were sacrificed at 72 h. Compared with the I/R group, the morphology of nerve cells in the intervention group was reduced, the number of TUNEL-positive cells decreased, the expression of cortical cytoplasm Cyt C decreased, and the mitochondrial absorbance value increased. All of these differences were statistically significant. Atorvastatin could inhibit neuronal apoptosis and alleviate the cerebral I/R injury. The mechanism may be related to the blocking
of the MPTP opening and the subsequent reduction of Cyt C release.

**Key words:** Atorvastatin; Mitochondrial permeability transition pore; Cytochrome C; Cerebral ischemia and reperfusion; Apoptosis