Experimental Study of the Protective Effect of Rhizoma Coptidis Extract (Berberine) to Ischemic brain Injuries
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Ischemic brain injury is a significant problem for basic and clinical medicine. Investigation of the prevention and treatment of ischemic brain injury has important clinical significance.

Berberine (Rhizoma Coptidis Extract) is extracted from the root of Coptidis plant. It is a kind of amine chemical compound, and was used mainly for treating intestinal infections. Recently it was found to have other usage, such as protective action to myocardial ischemia to enable the organism to utilize low oxygen and to have tolerance to ischemic condition. But the action of berberine to brain ischemia has not been reported. This study is intended to determine the therapeutic effect of rhizoma coptidis extract injection after global brain ischemia in rat.

SD rats, male and female, weighted 250-350gm were used for this experiment. Using Pulsineli-Brierley 4-vessel obstruction ischemic models, half hour before ischemia of both hemispheres, berberine was injected intraperitoneally at dose of 30mg/kg. After 20 minutes of, the animals were reperfused again. Injection of berberine was given continuously for three days, on each day with the dose of 8mg/kg. In the control group equivalent amount of water was injected, the following procedure was the same as experimental group. Survival was 7 days. All animals under anesthesia were perfused and fixed. The brain sections were taken for Nissl's staining and modified Gallyas silver impregnation staining. The results were: (1) In the experimental group, during the survival period after ischemia, the incidence of epilepsy onset was 16%. In the control group it was 30% (P<0.01). (2) In the experimental group, about 40% of the pyramidal cells in Nissl's preparation of CA1, CA2, CA4 hippocampal areas showed necrosis and disintegration of cellular structure. In the control group it was 95%. (3) In the experimental group with silver impregnation staining, in CA1, CA2, CA4 areas the pyramidal cells and their processes were stained nearly golden color (normal condition). In the control group at the corresponding areas, the pyramidal cells and their processes showed black staining product and deep grey color (degenerating). (4) CA3 area of hippocampus of rat was ischemic resistant area. Ischemic results in the experimental group and control group were similar to that of the normal non-ischemic rats. The above results showed that berberine has a prevention and therapeutic effect to epilepsy onset induced by ischemia and it has the effect of preventing the late onset of neuronal injury. Its mechanism required further investigation.