Resveratrol preconditioning increases the neurogenesis from reactive astrocytes in in vitro stroke model.

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Abstract: Objective: Ischemic stroke is one of the leading causes of mortality and significant disability, which incidence of Ischemic stroke accounts for 60-80\% of all the stroke patients. The neurogenesis gives us a potent method for treating ischemic stroke patients. Recent studies showed that astrocytes in the penumbra after stroke can acquire the stem-cell-like properties and increase the neurogenesis in the stroke. And also, resveratrol play the impotent function in the ischemic stroke, but its precise mechanism remains unclear. The present study is to explore the role of resveratrol preconditioning in stroke model. Methods: The astrocytes were cultured from the brain of newborn SD rats. After purifying, the astrocytes were cultured in glucose-free artificial cerebrospinal fluid in the 2\% oxygen condition for 4 hours. Then the astrocytes were transfered into stem cell culture medium for next 5 days. The neurospheres will grow in the culture system. Resveratrol preconditioning was used to detect the role of resveratrol on the neurogenesis. Different doses of resveratrol were added in the culture system for 24 hours as preconditioning before carrying oxygen-glucose deprivation. And also the differentiate possibility of new generated
progenitor cells were detected. The neurons derived from these progenitor cells were studied. **Results:** (1) Astrocytes could be reactivated in the oxygen-glucose deprivation condition and acquired the properties of stem cells. (2) These new generated progenitor cells can re-differentiate into neurons and play the neurogenesis function. (3) Resveratrol preconditioning can stimulate the reactivity of astrocytes and increase the generation of progenitor cells from reactive astrocytes. **Conclusion:** The role of resveratrol in the stroke might be stimulating the reactivity of astrocytes and increasing the neurogenesis from reactive astrocytes.

**Keywords:** Resveratrol Preconditioning; Stroke; Neurogenesis; Reactive astrocytes