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# Hydrogen-rich saline attenuates hippocampus endoplasmic reticulum stress after cardiac arrest in rats

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## Abstract

**Background:** Hydrogen-rich saline can selectively scavenge reactive oxygen species (ROS) and protect brain against ischemia reperfusion (I/R) injury. Endoplasmic reticulum stress (ERS) has been implicated in the pathological process of cerebral ischemia. However, very little is known about the role of hydrogen-rich saline in mediating pathophysiological reactions to ERS after I/R injury caused by cardiac arrest.

**Methods:** The rats were randomly divided into three groups, sham group (n=30), ischemia/reperfusion group (n=40) and hydrogen-rich saline group (n=40). The rats in experimental groups were subjected to 4min of cardiac arrest and followed by resuscitation. Then they were randomized to receive 5ml/kg of either hydrogen-rich saline or normal saline.

**Results:** Hydrogen-rich saline significantly improves survival rate and neurological function. The beneficial effects of hydrogen-rich saline were associated with decreased levels of oxidative products, as well as the increased levels of antioxidant enzymes. Furthermore, the protective effects of hydrogen-rich saline were accompanied by the increased activity of glucose-regulated protein 78 (GRP78), the decreased activity of cysteinyl aspartate specific proteinase-12 (caspase-12) and C/EBP homologous protein (CHOP).

**Conclusions:** Hydrogen-rich saline attenuates brain I/R injury may through inhibiting hippocampus ERS after cardiac arrest in rats.

**Keywords:** Apoptosis; CPR; Endoplasmic reticulum stress; Hydrogen; Oxidative stress.

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