



## Neuroprotective Effect and Chemical Composition of Traditional Chinese medicines, Zha-Chong-Shi-San-Wei Pill, Against Ischemic Stroke on Middle Cerebral Ischemia Occlusion in Rats

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**SUMMARY.** Zha-Chong-Shi-San-Wei (ZCSSW) in pill form is a compound prescription formulated according to the meridian theory of TCM and is approved by the State Food and Drug Administration of China for the treatment of ischemic stroke. The aim of this study was to test the neuroprotective effects of Chinese medicine ZCSSW pill on cerebral ischemia in rats and to explore the potential mechanisms. Male Wistar rats were randomly divided into 5 groups: sham group, middle cerebral artery occlusion (MCAO) group, and pretreatment groups which were treated with ZCSSW 0.125, 0.25 or 0.5 g/kg (i.g.) 0 min before MCAO, respectively. Cerebral ischemia was induced by 2 h of middle cerebral artery occlusion. Cerebral infarct area was measured by 2,3,5-triphenyltetrazolium chloride (TTC) staining at 24 h following reperfusion, and neurological functional deficits were assessed at 24 h after reperfusion. The neuroprotective effect of ZCSSW pill against ischemic stroke was evaluated by neurological deficit score (NDS) and brain water content. The content of superoxide dismutase (SOD), malondialdehyde (MDA), lactate dehydrogenase (LDH) glutathione peroxidase (GSH-Px), nitric oxide synthase (NOS) and the level of tumor necrosis factor- $\alpha$  (TNF- $\alpha$ ), interleukin (IL)-1 $\beta$  and interleukin (IL)-8 after 2 h of MCAO in rats were detected to investigate its anti-oxidative action and anti-inflammatory property. Pretreatment with ZCSSW Pill significantly reduced cerebral infarct area, increased in GSH and SOD, and decreased the NDS, edema, MDA, LDH, TNF- $\alpha$ , IL-1 $\beta$  and IL-8 compared with rats in the MCAO group at 24 h after reperfusion and pathological sections of brain tissue were observed. GCMS analysis showed that muscone, methyl eugenol,  $\alpha$ -asarone may be the active ingredients in ZCSSW Pill. The study suggests the neuroprotective effect of ZCSSW pill in the MCAO model of rats. The anti-oxidative action and anti-inflammatory property of ZCSSW pill may contribute to a beneficial effect against stroke. It shows that ZCSSW has significant cerebral protective role on focal ischemia brain damage.

**KEY WORDS:** Anti-inflammatory, Anti-oxidation, Cerebral ischemia, GCMS, Zha Chong Shi San Wei pill.

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