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**Ling-Yang-Gou-Teng-Decoction prevents vascular dementia through inhibiting oxidative stress induced neurovascular coupling dysfunction**

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**Abstract**

*Ethnopharmacological relevance:* Vascular dementia (VaD) is the common cognitive disorder derived mainly from lacunar stroke (LS). The oxidative stress induced neurovascular coupling (NVC) dysfunction involves in the pathogenesis of VaD. Currently, there is no specific drug for VaD. Ling-Yang-Gou-Teng -Decoction (LG), a well-known traditional Chinese formula, has been used for preventing VaD in clinic.

*Aim of the study:* In this study, we aimed to investigate the underlying mechanism of LG on VaD in rats.

*Materials and method:* VaD was replicated with autologous micro-thrombi against the background of hypercholesterolemia induced with high fatty diet. PTX (68.90mg/kg/day), LG with three dosages (2.58, 8.14, 25.80g/kg/day) was orally administrated to VaD rats, respectively. The NVC sensitivity was defined as the ratio of the microcirculative cerebral blood velocity (CBV) to the electroencephalograph (EEG) before and after penicillin stimulation. Behavioral performance, pathological changes of brain and oxidation related molecules were detected to assess the effects of LG on VaD.

*Results:* LG exhibited beneficial effects on the VaD, which was demonstrated as improved exploratory, learning and memory abilities, relieved vascular or neural pathological changes in cerebral cortex or hippocampus. LG maintained NVC sensitivity, which was confirmed as

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