Pharmacological actions of Danggui Buxue Tang (DBT) on oxygen-glucose reperfusion (OGD/R)-insulted mouse brain endothelial (bEnd.3) cells

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Abstract:

Danggui Buxue Tang (DBT), a traditional Chinese herbal formula comprising Astragali Radix and Angelicae Sinensis Radix, is widely used among menopausal women in Asia due to its reported estrogenic effects. Despite its popularity, the pharmacological impact of DBT on cerebral endothelial cells remains uncertain. This study aimed to investigate the effects of DBT on blood-brain barrier (BBB) breakdown by OGD/R injury in an in vitro model with mouse brain endothelial (bEnd.3) cells.

The effects of DBT on bEnd.3 cell proliferation were assessed using MTT. Its protection against BBB breakdown was examined by western blot and transendothelial electrical resistance (TEER) values. Reactive oxygen species (ROS) level was evaluated by DCFDA stain. Results indicated that DBT (0.01-3 mg/ml) concentration-dependently increased bEnd.3 cell proliferation (***$p < 0.001$). OGD/R injury significantly reduced cell viability by 50%, which DBT (0.01-3 mg/ml) effectively attenuated (***$p < 0.001$). DBT treatment preserved membrane integrity, evidenced by restored expression of ZO-1 and Claudin-5 (*$p < 0.05$) and increased TEER values (****$p< 0.0001$). Moreover, DBT significantly decreased ROS levels (****$p < 0.0001$) in a dose-dependent manner (0.3-3 mg/ml).

This study provided evidence for the therapeutic effectiveness of DBT for vascular dementia via multifaceted therapeutic approach, including protection of BBB integrity and oxidative stress suppression. In recent years, hormone replacement therapy (HRT) has long been the only treatment for distressing menopausal symptoms. However, its clinical use in menopause symptoms management has been questioned as the evidence is growing for the increased risks associated with chronic HRT. Further investigation will delve into the underlying mechanisms and clinical trials

will be conducted to substantiate the potential of DBT as an innovative solution for managing menopausal symptoms while mitigating the risks associated with chronic HRT use.