CTRP9

C1q/TNF-Related Protein 9 (CTRP9), is an adiponectin receptor agonist.

Data indicated that CTRP9 may alleviate airway inflammation and remodeling in asthma. [1)].

Emerging evidence indicates that C1q/TNF-Related Protein 9 (CTRP9), a newly discovered adiponectin receptor agonist, exerts neuroprotection in cerebrovascular disease. The aim of this study was to investigate the anti-apoptotic role of CTRP9 after experimental ICH and to explore the underlying molecular mechanisms. ICH was induced in mice via intrastriatal injection of bacterial collagenase. Recombinant CTRP9 (rCTRP9) was administrated intranasally at 1 h after ICH. To elucidate the underlying mechanisms, adiponectin receptor1 small interfering ribonucleic acid (AdipoR1 siRNA) and selective PI3 K inhibitor LY294002 were administered prior to rCTRP9 treatment. Western blots, neurofunctional assessments, immunofluorescence staining, and Fluoro-Jade C (FJC) staining experiments were performed. Administration of rCTRP9 significantly improved both short- and long-term neurofunctional behavior after ICH. RCTRP9 treatment significantly increased the expression of AdipoR1, PI3 K, p-Akt, and Bcl-2, while at the same time was found to decrease the expression of Bax in the brain, which was reversed by inhibition of AdipoR1 and PI3 K. The neuroprotective effect of rCTRP9 after ICH was mediated by attenuation of neuronal apoptosis via the AdipoR1/PI3K/Akt signaling pathway; therefore, rCTRP9 should be further evaluated as a potential therapeutic agent for ICH patients. [2)].

Findings demonstrated that administration of rCTRP9 attenuated neuroinflammation through AdipoR1/AMPK/NFκB signaling pathway after ICH in mice, thereby reducing brain edema and improving neurological function after experimental ICH in mice. Therefore, CTRP9 may provide a potential therapeutic strategy to alleviate neuroinflammation in ICH patients [3)].

C1q and tumor necrosis factor-related protein 9 (CTRP9) is a novel cytoprotective cytokine with antioxidant effects, which is highly expressed in brain tissue. The present study tested the hypothesis that CTRP9 might act as an antisenescence factor to promote the rejuvenation of aged MSCs. MSCs were isolated from the bone marrow of young (8-weeks-old) and aged (18-months-old) male C57BL/6 mice. Cell proliferation was measured by Cell Counting Kit-8 assay and cell viability was determined by MTT assay. Gene expression levels of interleukin (IL)-6 and IL-10 were evaluated with reverse transcription-quantitative polymerase chain reaction, and secretion of vascular endothelial growth factor, basic fibroblast growth factor, hepatocyte growth factor, and insulin-like growth factor were measured by ELISA. The expression levels of proteins in the peroxisome proliferator-activated receptor γcoactivator (PGC)-1α/AMP-activated protein kinase (AMPK) signaling pathway were investigated with western blotting. Oxidative stress was evaluated by detecting mitochondrial membrane potential, reactive oxygen species, superoxide dismutase activity and malondialdehyde. MSCs isolated from aged mice exhibited reduced proliferation and viability, and impaired immunoregulatory and paracrine abilities, compared with MSCs from younger mice. CTRP9 had a

significant antisenescence effect in aged MSCs by activating PGC-1α/AMPK signaling and decreasing the oxidative response. Silencing either PGC-1α or AMPK abolished the above effects of CTRP9. These results suggest that CTRP9 may have a critical role in cellular senescence by facilitating stem cell rejuvenation, and may therefore have the potential to enhance the efficacy of stem cell therapy [4].

References

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