The Effects of Mouse Recombinant Resistin on mRNA Expression of Proinflammatory and Anti-Inflammatory Cytokines and Heat Shock Protein-70 in Experimental Stroke Model

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Background: Our recent research showed that resistin has a neuroprotective effect against stroke-induced injury through suppressing apoptosis and oxidative stress. However, the molecular mechanism of neuroprotection of resistin is unclear. This work was designed to examine the effect of mouse recombinant resistin on mRNA expression of Tumor necrosis factor-α (TNF-α), Interleukin-1β (IL-1β), Interleukin-10 (IL-10), Transforming growth factor-β1 (TGF-β1), and Heat shock protein-70 (HSP-70) in mouse model of stroke. Materials and Methods: Transient focal cerebral ischemia was induced by the middle cerebral artery occlusion (MCAO) in mice. TNF-α, IL-1β, IL-10, TGF-β1, and HSP-70 mRNA were detected at sham (0 hour), 3 hours, 6 hours, 12 hours, and 24 hours after MCAO using real-time QRT-PCR method. Moreover, animals were treated with resistin at the dose of 400 ng/mouse at the commencement of MCAO, and mRNA expression of the cytokines and HSP-70 was measured 24 hours after MCAO. Results: Tumor necrosis factor-α and IL-1β mRNA expression markedly increased at 12-hour time point and then returned to the basal level at 24 hours after MCAO, but HSP-70 mRNA expression increased at 24-hour time point. Furthermore, resistin (400 ng/mouse) significantly increased TGF-β1 and IL-10 and decreased HSP-70 gene expression at 24 hours after MCAO. Conclusions: Our findings revealed that a molecular mechanism of attenuating ischemic damage by resistin administration probably is increased mRNA expression of anti-inflammatory cytokines. However, applying resistin in the clinical settings for the treatment of stroke deserves further researches in the future.

Key Words: Resistin—cerebral ischemia—gene expression—cytokines—heat shock protein-70—mice

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Introduction

Adipokine resistin, a cysteine-rich polypeptide, is mainly released from adipose tissue and macrophage cells, and has an important link with insulin resistance, diabetes, obesity and atherosclerosis.1,2 A number of human studies reported that there might be an association between plasma level of resistin and risk of cardiovascular and cerebrovascular diseases.3,4 Based on some scientific evidence, resistin has protective effects against the heart injury5 neurodegenerative insults6 and brain ischemia.7,8

Adipokine resistin is a fat-brain axis regulator.9 Although resistin expression was primarily identified in adipocytes, low level of resistin gene expression is also found in the normal mouse brain.! Our recent finding indicated that resistin mRNA expression considerably increased at 12 hours after cerebral ischemia in cortex of