Andrographolide protects mice from influenza A induced-pneumonia via regulation of the PI3K/AKT signaling pathway

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Abstract

Influenza A virus (IAV) infection causes a frenzied host response, which promotes acute lung inflammation. Andrographolide, an active component extracted from *Andrographis paniculate*, exerts significant inhibitive effects on acute inflammation induced by IAV. However, the molecular mechanism of the anti-inflammatory and antiviral effects remains poorly understood. Here, we found that andrographolide reduced mortality, alleviated body weight loss, and decreased lung index and inflammatory cytokines secretion rather than inhibiting viral replication. Further study with RNA-seq analysis revealed that the PI3K/AKT signaling pathway is significantly activated in the lungs of andrographolide-treated mice. The phosphorylated AKT and PI3K were significantly increased after andrographolide intervention by Western blot. Moreover, [pyroptosis](javascript:;)-related proteins, and downstream pathways of the PI3K/AKT signaling pathway, including cleaved-caspase 3 and GSDME-N, were decreased. The protective effect of andrographolide was significantly reduced after treatment with an AKT inhibitor. In summary, our findings suggested that andrographolide exerts a protective effect on IAV-induced [pneumonia](javascript:;) by activating the PI3K/AKT signaling pathway, which may represent a novel therapeutic strategy for IAV infection.

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