4-methoxycinnamyl *p*-coumarate from *Etlingera pavieana* inhibits inflammatory response via NF-κB signaling pathway in microglial cells

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Abstract: 4-methoxycinnamyl *p*-coumarate (MCC) is one of active compounds isolated from *Etlingera pavieana* rhizomes. MCC has been previously reported to exhibit anti-inflammatory effects in macrophages and carrageenan-induced paw edema in rats. However, the anti-inflammatory activities of MCC in microglial cells have never been reported. Thus, in this study, we further investigated anti-inflammatory activity and possible mechanisms involved in lipopolysaccharide (LPS)-stimulated BV2 microglial cells. The cytotoxicity of MCC on microglial cells was measured, and a non-toxic dose was selected for the anti-inflammation evaluation. The inflammatory responses of LPS-stimulated microglial cells were assessed by determinations of nitric oxide (NO), prostaglandins E_2 (PGE_2), and tumor necrosis factor-α (TNF-α) productions. In addition, the levels of critical enzymes and chief molecules in NF-kB pathways are determined. The results showed that MCC clearly inhibited the production of NO, PGE_2, and TNF-α in microglial cells. Concomitantly, the reductions of inducible nitric oxide synthase (iNOS), cyclooxygenase-2 (COX-2), and TNF-α in a dose-dependent manner were observed. Furthermore, MCC suppressed the phosphorylations of inhibitor of NF-κB (IκB) and p65 subunit and decreased NF-κB nuclear translocation. In conclusion, MCC exhibits the potent anti-inflammatory activity in the LPS-stimulated microglial inflammation model by inactivation of NF-κB signaling pathway leading to reduced levels of NO, PGE_2 and TNF-α. Altogether, MCC may be as a potential therapeutic agent for neuroinflammatory disease treatment.

Keywords: Anti-inflammatory activity; 4-methoxycinnamyl *p*-coumarate; Microglial cells; Nitric oxide; Prostaglandins E_2; Tumor necrosis factor-α

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