

Ficus deltoidea: potential inhibitor of pro-inflammatory mediators in lipopolysaccharide-induced activation of microglial cells

ABSTRACT

Ethnopharmacological relevance: *Ficus deltoidea* Jack (FD) is widely consumed in traditional medicine as a treatment for various diseases in Malaysia. Each part of the plant such as its leave, stem, fruit and root are used traditionally to treat different types of diseases. Vitexin and isovitexin are bioactive compounds abundantly found in the leaves of FD that possessed many pharmacological properties including neuroprotection. Nonetheless, its effects on key events in neuroinflammation are unknown. Aim of the study: To determine the inhibitory properties of FD aqueous extract on pro-inflammatory mediators involved in lipopolysaccharide (LPS)-induced microglial cells. Methods: Vitexin and isovitexin in the extract were quantified via high performance liquid chromatography (HPLC). The extract was evaluated for its cytotoxicity activity via 3-(4,5-dimethylthiazol-2-yl)-2,5-diphenyltetrazolium bromide (MTT) assay. Pre-treatment with the extract on LPS-induced microglial cells was done to determine its antioxidant and anti-neuroinflammatory properties by measuring the level of reactive oxygen species (ROS), nitric oxide (NO), tumour necrosis factor alpha (TNF- α), interleukin-1 β (IL-1 β) and interleukin-6 (IL-6) via 2'-7'-dichlorofluorescein diacetate (DCFDA) assay, Griess assay and Western blot respectively. Results: The extract at all tested concentrations (0.1 $\mu\text{g/mL}$, 1 $\mu\text{g/mL}$, 10 $\mu\text{g/mL}$, 100 $\mu\text{g/mL}$) were not cytotoxic as the percentage viability of microglial cells were all above ~80%. At the highest concentration (100 $\mu\text{g/mL}$), the extract significantly reduced the formation of ROS, NO, TNF- α , IL-1 β and IL-6 in microglial cells induced by LPS. Conclusion: The extract showed neuroprotective effects by attenuating the levels of pro-inflammatory and cytotoxic factors in LPS-induced microglial cells, possibly by mediating the nuclear factor-kappa B (NF- κB) signalling pathway.

Keyword: Alzheimer's disease; Neuroinflammation; *Ficus deltoidea*; Vitexin; Isoviteixin