Effective parts of Smilax china L. suppresses inflammatory responses in LPS-induced THP-1 cells via MAPK and NF-κB signaling pathways

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BACKGROUND:
Traditional Chinese medicine Smilax is the rhizome of liliaceous plant Smilax China L., which is used to treat pelvic inflammatory disease and adnexitis. Smilax contains chemical ingredients such as flavonoids, saponins, tannins, etc. Previous research results showed that the flavonoids and saponins of Smilax are effective parts inhibiting inflammation. However, the anti-inflammatory mechanisms remain unclear. The purpose of this study was to investigate suppresses inflammatory responses of effective parts of Smilax china L. (EPS) in LPS-induced THP-1 cells via MAPK and NF-κB signaling pathways.

METHODS:
In this study, cell viability was evaluated by CCK-8 assay. The production of 6-Keot-PGF1α and PGE2 were determined by ELISA in order to investigate selectively inhibiting COX-2 of EPS. The content and mRNA levels of IL-1β, IL-6, and TNF-α were assayed by ELISA and Real-time PCR, respectively. Protein expression levels of inflammatory mediators of P38, ERK1/2, JNK, IKKα, IκBα and p65 were analyzed by Western blotting.

RESULTS:
It was found that treatment with EPS suppressed the expression of PGE2 and 6-Keot-PGF1α, and the ratio of IC50(COX-1)/IC50(COX-2) of EPS was 3.15, which indicated that EPS could selectively inhibit COX-2. EPS dose-dependently (12.5, 25, 50 mg/L) decreased the production and mRNA levels of pro-inflammatory cytokines IL-1β, IL-6, and TNF-α. Furthermore, EPS significantly decreased LPS-induced phosphorylation of p38, JNK, ERK1/2, p65, and inhibited the expression of IKKα and the degradation of IκBα.

CONCLUSION:
The results suggested that EPS was a COX-2 selection inhibitor, and the anti-inflammatory effect of EPS was associated with the inhibition of IL-1β, IL-6, and TNF-α via negative regulation of MAPK and NF-κB signaling pathways in LPS-induced THP-1 cells.