Anti-inflammatory Effects of the Biflavonoid Biflata on Macrophage

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Innate immune response is the protective response of the human body to defend against harmful invaders. However, excessive or dysregulated inflammation may harm human body. Steroids are often used to reduce the excessive inflammation, yet they sometimes bring about adverse effects. We therefore need to develop anti-inflammatory treatment with fewer side effects. Here we investigate whether a biflavonoid isolated from plant extract, Biflata, has anti-inflammatory effects. During inflammation, NF-kappaB is activated to release pro-inflammatory cytokines, followed by macrophage migration to inflammatory tissues. We used a macrophage cell line to examine the induction of pro-inflammatory cytokines, integrins, and NF-kappaB by lipopolysaccharide (LPS) by protein and RNA measurement, and whether Biflata can alleviate this induction. We showed that Biflata inhibited the secretion of pro-inflammatory cytokines TNF, IL-1beta and IL-6; it also suppressed mRNA expression of integrins Itgalb2 and Itga4b1, and cytoskeleton regulators Cdc42, PAK1, WASP, Rac1 and LIMK1 in LPS-induced macrophage. Biflata also prevented F-actin from reorganizing. Moreover, Biflata suppressed the expression of NF-kappaB in LPS-induced macrophage. In addition, Biflata decreased the transcriptional activities of estrogen receptor alpha (ERalpha) in our reporter gene assay. Therefore, Biflata effectively inhibited inflammation through modulating the NF-kappaB pathway, and ERalpha might mediate Biflata effect to reduce inflammation. In conclusion, Biflata can be developed into a novel anti-inflammatory treatment.

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