

Standardized curcuminoid extract (*Curcuma longa* L.) decreases gene expression related to inflammation interacts with associated microRNAs in human umbilical vein endothelial cells (HUVEC)

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Chronic inflammation induced by pathogenic bacterial or viral infection, or other factors play a crucial role in the progression of atherosclerosis. Additionally, other pro-inflammatory mediators like intercellular adhesion molecules (ICAMs) and vascular cell adhesion molecule-1 (VCAM-1), and endothelial-selection (E-selectin) are known to be involved in causing endothelial dysfunction and tissue injury. Studies have discussed about the role of miRNAs (miRNA-126 and miRNA-146a), regulatory RNAs, during inflammatory process.

Studies have demonstrated effects of natural compounds, such as Curcuminoids on inflammation-involved miRNAs in conditions like cancer and apoptosis. However, protective role of Curcuminoids and involvement of miRNAs against chronic inflammation and related endothelial dysfunction is yet to be determined.

Objective:

To explicate involvement of miRNA-126 and miRNA-146a in the anti-inflammatory effects of Curcuminoids in human umbilical vein endothelial cells (HUVEC).

Study Design:

Cell viability assay was performed in the presence of Curcuminoids for 24 h

Intracellular reactive oxygen species (ROS) generation was determined by stimulating HUVEC with *E. coli* lipopolysaccharides (LPS) (1 µg/mL) after treating with varying concentrations of Curcuminoids (0–10 mg/L) for 60 min

mRNA analysis was done on cells pre-treated with varying concentrations of Curcuminoids (0–5 mg/L) for 30 min. followed by LPS-challenge for 24 h
MicroRNA analysis was carried out using qRT-PCR

Furthermore, western-blot analysis and multiplex bead assay were performed to evaluate protein expression

Results and Discussion:

Treatment with Curcuminoids at varying concentrations resulted no change in cell viability and showed protection against ROS generation as well

Curcuminoids treatment also down-regulated the LPS-challenge induced mRNA and protein levels of pro-inflammatory mediators, such as NF- κ B, IL-6, TNF- α

In addition, LPS-induced up-regulation of miRNA 146a was inhibited by Curcuminoids. Similarly, Curcuminoids decreased the mRNA expression of VCAM-1 and ICAM-1

Conclusion:

It was concluded that Curcuminoids exhibit anti-inflammatory effects in HUVEC.