



Biochemical Research of the Effects of Essential Oil Obtained from the Fruit of *Myrtus communis* L. on Cell Damage Associated with Lipopolysaccharide-Induced Endotoxemia in a Human Umbilical Cord Vein Endothelial Cells

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Abstract

The aim of this study to investigate the potential effects of essential oils and compounds obtained from MC fruit on sepsis induced endothelial cell damage in human umbilical cord vein endothelial cells (HUVECs) at molecular and cellular levels on in vitro sepsis model. A sepsis model was induced by the application of LPS. The HUVEC treatment groups were as follows: control, LPS, MC, MC plus LPS, 1.8 cineole, 1.8 cineole plus LPS, α -pinene, α -pinene plus LPS, α -terpineol, and α -terpineol plus LPS. Following the treatments, cell proliferation was analyzed using the xCELLigence® system. The mRNA expression of various cytokines [tumor necrosis factor (TNF- α), interleukin-1 β (IL-1 β), and IL-6] and endothelial nitric oxide (eNOS) were determined by quantitative polymerase chain reaction (qPCR) analysis. The 1.8 cineole and α -pinene treatments at specific doses showed toxic effects on α -terpineine, although it did not result in a change in the cellular index as compared with that of the control group. The application of LPS to HUVECs led to a significant decrease in the cellular index, depending on the treatment time. It did not correct the decreased cell index of MC plus LPS and α -terpineol plus LPS groups as compared with that of the LPS-only group. The 1.8 cineole plus LPS treatment and α -pinene plus LPS treatment significantly increased the cell index as compared with that of the LPS-only treatment, and the cell index in these groups was closer to that of the control. According to the results of the qPCR analysis, neither the MC-only treatment nor the α -terpineol-only treatment significantly reduced cellular damage caused by LPS-induced increases in TNF- α , IL-1 β , IL-6, and eNOS mRNA expression. However, both the 1.8 cineole treatment and α -pinene treatments significantly decreased TNF- α , IL-1 β , IL-6, and eNOS mRNA expression induced by LPS. Volatile oil obtained from MC fruit and the MC compound α -terpineol had no effect on the decreased cell index and increased cytokine response due to LPS-induced endothelial cell damage. However, 1.8 cineole and α -pinene, other major