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Protective Effect of Phyllanthus Emblica Fruit Extract Against Hydrogen Peroxide-Induced Endothelial Cell Death

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Abstract

Numerous antioxidants from natural products have been shown to lower ROS levels and enhance vascular endothelial function. The fruits of *Phyllanthus emblica* are well-known in possessing antioxidative properties but its role and mechanisms in the protection of vascular endothelial cells from ROS damage have not yet been established. The present study was aimed to determine the possible protective effect of *P. emblica* fruit extract (PE) on human EA.hy926 endothelial cell death induced by hydrogen peroxide (H₂O₂) and PE protective mechanisms. Following incubation of endothelial cells with 300 microM H₂O₂ for 2 h, cell viability was decreased to 50.65 ± 0.94% and intracellular ROS levels was increased to 159.01% ± 6.27% as measured by MTT assay and DCF fluorescent intensity, respectively. Cytotoxic effect of PE was not observed in the range of 0.1 to 100 microM. Pretreatment with PE (20 to 100 microg/mL) for 48 h significantly ameliorated the cytotoxic effect of H₂O₂ and attenuated the excessive intracellular ROS formation in endothelial cells. In addition, western blot analysis revealed that PE pretreatment (40 microg/L) induced Akt phosphorylation but did not activate NF- κ B pathway. These findings suggest that PE could effectively protect human endothelial cell death induced by H₂O₂ via modification of ROS-related mechanism along with activation of PI3K/Akt pathway. However, the value of this plant in vivo needs further investigations in supporting them to be developed as nutraceuticals for cardiovascular disease prevention.

Keywords: *Phyllanthus emblica*, Endothelial cell, Reactive oxygen species, Cell death

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