UNIVERSITI TEKNOLOGI MARA

ANTI-INFLAMMATION EFFECT OF GENISTEIN AND DAIDZEIN ON OXIDISED LOW-DENSITY LIPOPROTEIN-STIMULATED HUMAN CORONARY ARTERY ENDOTHELIAL CELLS

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MSc

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AUTHOR'S DECLARATION

I declare that the work in this thesis was carried out in accordance with the regulations of Universiti Teknologi MARA. It is original and is the results of my own work, unless otherwise indicated or acknowledged as referenced work. This thesis has not been submitted to any other academic institution or non-academic institution for any degree or qualification.

I, hereby, acknowledge that I have been supplied with the Academic Rules and Regulations for Post Graduate, Universiti Teknologi MARA, regulating the conduct of my study and research.

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ABSTRACT

Oxidised low-density lipoprotein (OxLDL) exerts adverse reaction to the endothelial cells in chronic oxidative disorder like atherosclerosis. Adhesion molecules such as VCAM-1 and ICAM-1, are regarded as key inflammatory markers promoting the endothelial cell injury, whereas nitric oxide regulates the disease process under OxLDL exposure. Isoflavones, genistein and daidzein, possess anti-inflammatory effects to improve the endothelial deterioration. However, the effects of genistein and daidzein on OxLDL stimulated endothelial injury and its inflammatory changes remain unexplored. In this study, the anti-inflammation role of genistein and daidzein on human coronary artery endothelial cells (HCAECs) under OxLDL exposure was investigated. The cells stimulated with 100 μg/mL of OxLDL showed reduced in cell viability rate. Different concentrations of genistein and daidzein were used as treatment for OxLDL stimulated HCAECs. VCAM-1 and ICAM-1 along with endothelial nitric oxide synthase (eNOS), were analysed quantitatively by expression of ELISA and supported by the immunofluorescence staining. Following treatment with low concentration of genistein at 6.25 μg/ml and high concentrations of daidzein at 12.5 and 25 μg/ml showed lower expression of VCAM-1 and ICAM-1 which regulated the progression of OxLDL-stimulated endothelial injury in HCAECs. Increased level of eNOS was observed in genistein and daidzein treated groups when compared to the untreated OxLDL group. Our study showed that genistein and daidzein, improved the endothelial cell viability, eNOS production and reduced inflammatory reactions under OxLDL exposure. Thus, genistein and daidzein were believed to have potential therapeutic effect in rescuing endothelial cells against OxLDL.

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