

The protective effect of tea flavonoids on oxidative damage in peripheral blood-derived endothelial progenitor cells

Wahyu Widowati¹, Laura Wijaya², Dian Ratih Laksmiawati³, Rahma Micho Widyanto⁴, Pande Putu Erawijantari⁵, Nurul Fauziah⁵, Indra Bachtiar² and Ferry Sandra⁶

¹Maranatha Christian University, Indonesia

²Stem Cell and Cancer Institute, Indonesia

³Pancasila University, Indonesia

⁴Brawijaya University, Indonesia

⁵Biomolecular and Biomedical Research Center, Indonesia

⁶Trisakti University, Indonesia

Background: Previous studies have demonstrated that the development of endothelial dysfunction may contribute to the pathogenesis of cardiovascular disease. Accordingly, neovascularization of ischemic organs, myocardial infarction or cardiac failure are related to endothelial progenitor cells (EPCs). However, flavonoids, which consist of epigallo catechin gallate (EGCG), epicatechin gallate (ECG), epigallo catechin (EGC), catechin (C) in green tea, contain a group of active antioxidants that reverse increased oxidative stress that is associated with endothelial dysfunction, and reduce the risk of cardiovascular disease.

Objective: The objective of this research is to evaluate whether EGCG, ECG, EGC, C, to preserve EPCs from oxidative stress.

Method: Total mononuclear cells (MNCs) were isolated from peripheral blood. After 7 days of *in vitro* cultivation, EPCs were incubated with or without tea flavonoids. Number of cells, Reactive Oxygen Species (ROS) in 7 days incubation, determined the proliferation of EPCs.

Results: In order to examine the effect of EGCG, ECG, EGC, C on EPCs proliferation concentrations of 12.5 $\mu\text{mol/l}$ –100 $\mu\text{mol/l}$ were applied for EGCG, ECG, EGC, C in 7 cultivation days. Herein, 12.5 $\mu\text{mol/ml}$ concentrations achieve the best proliferation rates of all tea flavonoids. Furthermore, this concentration (12.5 $\mu\text{mol/l}$) was used for marker assay CD34, CD133 and VEGFR-2 and stress oxidative, apoptosis test on EPCs. The results showed that EGCG, ECG, EGC, C were able to decrease accumulation ROS levels on EPCs.

Conclusions: The advantages of EGCG, ECG, EGC, C in tea flavonoids are able to maintain EPCs marker, maintain the apoptotic on EPCs and decrease ROS level.

Biography

Wahyu Widowati has completed her doctor program at the age of 44 years from Padjadjaran Univeristy, Bandung and right now she is studying again the doctoral program at Faculty of Medicine, Brawijaya University, Malang. She is a lecturer and researcher at Faculty of Medicine, Maranatha Christian University, Bandung. She is president director of Biomolecular and Biomedical Research Center, Aretha Medika Utama, Bandung. She has published more than 30 papers in reputed journals and serving as an editorial board at Journal of Medical Health. She is a member of Ethics Committee Board of Faculty of Medicine, Maranatha Christian University and Immanuel Hospital, Bandung, Indonesia.

wahyu_w60@yahoo.com

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