

ABSTRACT

ANTIOXIDANT POTENTIAL OF THE EXTRACT OF GREEN TEA (*Camellia sinensis*) AND RED TEA (*Hibiscus sabdariffa*) IN ATHEROGENESIS PROCESS IN RATS WITH ATHEROGENIC DIET

Tea is a drink that is consumed by various levels of community in many countries. Tea is the second most-commonly consumed liquid after water. Several epidemiological studies indicated that polyphenol consumption of green tea as well as other herbal polyphenol may reduce the incidence rate of degenerative diseases, particularly the risk of atherosclerosis. Therefore, the potential and the antioxidant mechanism of the extract of green tea (*Camellia sinensis*) and red tea (*Hibiscus sabdariffa*) on the prevention of endothelial dysfunction should be studied further. The potential antioxidant effect of green tea (*Camellia sinensis*) is catechin and red tea (*Hibiscus sabdariffa*) is anthocyanin.

The objective of this study was to disclose the preventive effect of the administration of green tea (*Camellia sinensis*) and red tea (*Hibiscus sabdariffa*) extract to oxidative stress and atherogenesis in rats given with atherogenic diet.

This was a laboratory experimental study using separate sample pretest-posttest control group design. The experimental animals of Wistar strain *Rattus norvegicus* were randomly divided into seven groups, 1 pretest group, 4 treatment groups, i.e., atherogenic and red tea of 150 mg (A+TM150), atherogenic and red tea of 300 mg (A+TM300), atherogenic and green tea 150 mg (A+TH150), and atherogenic and green tea 300 mg (A+TH300), and 2 control groups, normal diet (ND) and atherogenic diet (AD). Each group consist of four rats. The length of the treatment was 8 weeks. Parameters measured was foam cells count, ADMA level, F2-isoprostan, and SOD levels in aortic tissue, and ADMA, F2-isoprostan and SOD levels in the serum. Data were analyzed multivariately using computerized statistical program.

The result revealed that foam cell count in aortic tissue of AD group was significantly higher ($p < 0.05$) compared to that in ND group, and so were the F2 isoprostan and ADMA levels both in aortic tissue and serum. SOD activity either in aortic tissue or serum in AD group was lower but not significant than that in ND. In all treatment groups (A+TM150, A+TM300, A+TH150, A+TH300), the four parameters showed significant difference ($p < 0.05$) as compared to AD. The highest reduction of foam cells was found in A+TH150 group. The highest reduction of ADMA in tissue and serum was found in A+TM300 group. The highest reduction of F2 isoprostan in endothelial tissue and serum was found in A+TM300 group. The highest increase of SOD in aortic tissue and serum was found in A+TH300. The result of discriminant analysis revealed that the discriminator variable of atherogenesis in the tissue was foam cell, SOD, and F2-isoprostan, while the discriminator variable of atherogenesis in the serum was SOD.

In conclusion, atherogenic diet given for 8 weeks successfully induced an oxidative stress and atherogenesis in rats. The administration of green tea and red tea was able to improve oxidative stress and reduce the progress of atherogenesis in rats with atherogenic diet. The preventive mechanism of red and green tea extract against atherogenesis is by relieving oxidative stress through the increase of SOD activity.

Keywords: atherogenic diet, red tea (*Hibiscus sabdariffa*), green tea (*Camellia sinensis*), foam cell, ADMA, F2-isoprostan, SOD