

**INCREASED INTESTINAL ABSORPTION OF CHLOROGENIC ACID  
PROMOTED BY COCONUT OIL REDUCES MACROMOLECULAR DAMAGE IN  
HUMANS**

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Antioxidants in the body can reduce oxidative stress. Reports indicate that medium-chain fatty acids (MCFAs) absorb small polar drug molecules. Coconut oil has a high percentage of MCFAs. Our previous studies indicate that coconut oil enhances the absorption of antioxidants such as caffeic acid in rats and chlorogenic acid in humans. The present study was conducted with human volunteers to study the effect of enhanced absorption of chlorogenic acid on the oxidation of macromolecules (lipids and proteins). Ethical clearance for the study was obtained from the Ethics Review Committee of the University of Kelaniya. The study involved three groups with 30 volunteers in each group. Group 1 received a gelatinous capsule with chlorogenic acid (450 mg) and coconut oil (1.00 mL), while Group 2 received a gelatinous capsule with chlorogenic acid (450 mg) and soybean oil. The control group received a gelatinous capsule containing only chlorogenic acid (450 mg). The control group reflects the baseline of the chlorogenic acid absorbed from food. Based on previous studies, blood samples were collected one hour after the oral administration of the capsule. Inhibition of lipid peroxidation in plasma was assessed by Thiobarbituric acid reactive substances (TBARS) assay. TBARS level of Group 1 ( $0.003 \pm 0.001 \mu\text{mol/mL}$ ) was significantly different ( $p \leq 0.05$ ) from that of Group 2 ( $0.007 \pm 0.001 \mu\text{mol/mL}$ ) and the control group ( $0.010 \pm 0.001 \mu\text{mol/mL}$ ). Inhibition of protein oxidation in plasma was assessed by protein carbonyl assay. Protein carbonyl level in Group 1 ( $0.98 \pm 0.11 \text{ nmol/mL}$ ) was significantly different ( $p \leq 0.05$ ) from those of Group 2 ( $2.06 \pm 0.13 \text{ nmol/mL}$ ) and control group ( $2.49 \pm 0.29 \text{ nmol/mL}$ ). The results indicate that the intestinal absorption of chlorogenic acid improves the antioxidant status of blood, thus protecting lipids and proteins from oxidative damage.

**Keywords:** Chlorogenic acid, Coconut oil, Soybean oil