

The Inhibition of Low Density Lipoprotein Oxidation and Cholesterol Accumulation on the Macrophage by Temulawak Extract

Aisyah Tri, Hidayah Dwiyanti, Deddy Muchtadi, Fransiska Zakaria

Abstract

Coronary heart disease is caused among others by atherosclerosis, which is the result of oxidized low density lipoprotein (LDL) and cholesterol accumulation on the macrophage. This were reported to be inhibited by temulawak (Curcuma xanthorrhiza Roxb). The objective of this study was to find out the types and concentrations of temulawak extract which could inhibit LDL oxidation, and to find out the effect of temulawak extract on the accumulation of cholesterol on macrophage. Temulawak was extracted by water, ethanol, acetone and dichloromethane. Inhibition of LDL oxidation was analyzed by measuring the level of malonaldehyde content of the oxidized LDL-CuSO₄ which were given water extract, ethanol extract, acetone extract and dichloromethane extract. of temulawak at concentrations of 43 µg, 430 µg, and 4300 µg per ml of LDL. The percentage of malonaldehyde reduction due to addition of water, ethanol, acetone and dichloromethane extract were 44.27; 47.68; 51.83 and 61.2 respectively. The inhibition of LDL oxidation by temulawak extract depends on the concentrations. The percentage of malonaldehyde reduction due to addition of temulawak extract of 43 µg, 430 µg, and 4300 µg per ml of LDL were 43.63; 56.72; and 53.89 Concentrations of temulawak extract resulting in the highest inhibition of LDL oxidation was 430 µg/ml LDL. Temulawak extract tends to inhibit cholesterol accumulation on the macrophage. There is a correlation between the inhibition of cholesterol accumulation on the macrophage and the inhibition of LDL oxidation by temulawak extract.

Key words : Low density lipoprotein, macrophage, cholesterol, temulawak (Curcuma xanthorrhiza Roxb)