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

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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, aceton and dichlorometane. 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, aceton extract and dichloromethane extract of temulawak at concentrations of 43 ?g, 430 ?g, and 4300 ?g per ml of LDL. The percentage of malonaldehyde reduction due to addition of water, ethanol, acetone and dichlorometane 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)