TESIS

PEMANFAATAN EKSTRAK DAUN KERSEN (*Muntingia calabura L*) TERHADAP KADAR KOLESTEROL DARAH, KADAR *SOLUBLE* ICAM-1 DAN PEMBENTUKAN SEL BUSA PADA TIKUS WISTAR

Studi pada Tikus dengan Diet Tinggi Lemak dan Kolesterol

BENEFICIAL EFFECTS OF CHERRY LEAF EXTRACT (*Muntingia calabura L*) ON BLOOD CHOLESTEROL LEVEL, SOLUBLE ICAM-1 LEVEL, AND FOAM CELLS FORMATION IN WISTAR RATS

Study on High Fat and Cholesterol Diet Rats

Untuk Memenuhi Persyaratan Wisuda

Magister Ilmu Gizi

Alvia Nur Layli
22030112410003

FAKULTAS KEDOKTERAN
UNIVERSITAS DIPONEGORO
SEMARANG
Agustus
2015

PEMANFAATAN EKSTRAK DAUN KERSEN (*Muntingia calabura L*) TERHADAP KADAR KOLESTEROL DARAH, KADAR *SOLUBLE* ICAM-1 DAN PEMBENTUKAN SEL BUSA PADA TIKUS WISTAR
(Studi pada Tikus dengan Diet Tinggi Lemak dan Kolesterol)

Alvia Nur Layli[1],Kis Djamiatun[2], Martha I. Kartasurya[3]

[1]Magister Ilmu Gizi Fakultas Kedokteran, Universitas Diponegoro
[2]Magister Ilmu Biomedik Fakultas Kedokteran, Universitas Diponegoro
[3]Fakultas Kesehatan Masyarakat, Universitas Diponegoro

ABSTRAK

Latar Belakang: Ekstrak daun kersen (EDK) terbukti mempunyai aktivitas antioksidan dan anti-inflamasi yang signifikan namun belum pernah dilakukan penelitian EDK terhadap kadar kolesterol dan inflamasi vaskuler.

Tujuan: Membuktikan pengaruh EDK terhadap kadar kolesterol darah, kadar *soluble* ICAM-1 dan pembentukan sel busa aorta tikus wistar yang diberi diet tinggi lemak dan kolesterol (DTL-TK).

Metode: Merupakan penelitian *true experiment* dengan desain *post test-only controlled group*, pada 24 wistar jantan dirandom menjadi 4 kelompok. Kelompok K1 diberi diet standar, K2 diberi DTL-TK, K3 diberi DTL-TK+EDK 250 mg/kg BB, K4 diberi DTL-TK+EDK 500 mg/kg BB. Kadar kolesterol di ukur secara enzimatik. Kadar *soluble* ICAM-1 diukur dengan metode ELISA. Sel busa dianalisis dari jaringan aorta abdominal yang dipulas dengan HE. Analisis data dilakukan dengan uji *One Way Anova* dan *Kruskal-Wallis*.

Hasil: Rerata kadar kolesterol total (KT) K4 (67,3±19,50 mg/dl) lebih rendah (p=0,026) dibanding K2 (91,1±20,250 mg/dl), rerata kadar KT K3 (85,4±8,93 mg/dl) lebih tinggi (p=0,014) dibanding K1 (74,1±5,20 mg/dl). Tidak ada perbedaan (p=0,153) kadar kolesterol LDL di antara 4 kelompok. Rerata kadar kolesterol HDL K2 (29,5±7,97 mg/dl) lebih tinggi dibanding K1 (21,3±4,56 mg/dl; p=0,017) dan K4 (20,0±4,87 mg/dl; p=0,007). Nilai tengah kadar *soluble* ICAM-1 K2 (4524±3159-6539 pg/ml) lebih tinggi dibanding K3 (2279±2104-4329 pg/ml; p=0,015) dan K4 (2341,5±1584-4179 pg/ml; p=0,009). Tidak terbentuk sel busa pada permukaan sel endotelium aorta abdominal di antara 4 kelompok.

Simpulan: Pemberian 500 mg/kg BB EDK menurunkan kadar KT tikus yang diberi DTL-TK. Pemberian 250 dan 500 mg/kg BB EDK menurunkan kadar *soluble* ICAM-1 dengan kemampuan sama pada tikus yang diberi DTL-TK. EDK belum dapat dibuktikan mencegah pembentukan sel busa.

Kata Kunci: daun kersen, kolesterol, *soluble* ICAM-1, sel busa

BENEFICIAL EFFECTS OF CHERRY LEAF EXTRACT (*Muntingia calabura L*) ON BLOOD CHOLESTEROL LEVEL, SOLUBLE ICAM-1 LEVEL, AND FOAM CELLS FORMATION IN WISTAR RATS (Study on High Fat and Cholesterol Diet Rats)

Alvia Nur Layli[1],Kis Djamiatun[2], Martha I. Kartasurya[3]

[1]Magister of Nutrition Faculty of Medical, Diponegoro University
[2]Magister of Biomedic Faculty of Medical, Diponegoro University
[3]Faculty of Public Health, Diponegoro University

ABSTRACT

Background: Cherry leaf proved for having antioxidant and anti-inflammation effects, its ability to decrease cholesterol level and prevent vascular inflammation has not been studied.

Objective: To prove the effect of cherry leaf (*Muntingia calabura extract*/MCE) on blood cholesterol level, soluble ICAM-1 level and aorta foam cells formation of Wistar that received HF-HCD.

Methods: A post test-only controlled experimental group study of 24 male Wistar, they were divided randomly into four groups. K1 and K2 groups received standard diet and HF-HCD, respectively. K3 and K4 groups both received HF-HCD and MCE in dose of 250 and 500 mg/kg BW each day, respectively. The serum cholesterol level were measured by enzimatic methods. The solube ICAM-1 were measured by ELIZA methods. Aorta foam cells formation were measured by HE-staining. Statistical analysis used were One Way Anova and Kruskal-Wallis tests.

Results: Total cholesterol (TC) mean of K4 (67.3±19.50 mg/dl) was lower (p=0.026) than K2 (91.1±20.25 mg/dl), TC mean of K3 (85.4±8.93 mg/dl) was higher (p=0.014) than K1 (74.1±5.20 mg/dl). LDL-C level was not different (p=0.153) among groups. HDL-C mean of K2 (29.5±7.97 mg/dl) was higher than K1 (21.3±4.56 mg/dl; p=0.017) and K4 (20.0±4.87 mg/dl; p=0.007). Soluble ICAM-1 median of K2 (4524±3159-6539 pg/ml) was higher than K3 (2279±2104-4329 pg/ml; p=0.015) and K4 (2341.5±1584-4179 pg/ml; p=0.007). There were no foam cells formation in endotel cells surface of aorta abdominalis between any groups.

Conclusion: The 500 mg/kg BW dose of MCE decreased TC level in rats that received HF-HCD. The 250 mg/kg BW and 500 mg/kg BW doses of MCE decreased soluble ICAM-1 level on similar ability in rats that received HF-HCD. MCE has not been concluded to inhibit foam cells formation.

Keyword: cherry leaf, cholesterol, soluble ICAM-1, foam cell