

INTISARI

PENGARUH PEMBERIAN EKSTRAK ETANOL KOPI HIJAU ROBUSTA (*Coffea canephora*) DAN LATIHAN FISIK INTENSITAS SEDANG TERHADAP KADAR GLUKOSA DARAH, INDEKS LEE DAN PERSENTASE EKSPRESI Peroxisome Proliferator Activated Receptor- γ (PPAR- γ) PADA TIKUS MODEL HIPERLIPIDEMIA

Latar belakang. Konsumsi makanan berlebihan dapat mengakibatkan peningkatan aktivasi jalur pensinyalan oleh metabolit lipid sehingga homeostasis seluler terganggu dan berkontribusi pada kematian sel. Pengaturan kerja reseptor PPAR- γ merupakan salah satu upaya pencegahan penumpukan lipid. Latihan fisik dapat menurunkan resiko penyakit kardiovaskular, hipertensi, diabetes tipe 2 dan terjadinya depresi. Asam klorogenat pada kopi hijau bermanfaat menurunkan berat badan, anti diabetes, anti inflamasi.

Metode Penelitian. Tikus diberi pakan standar dan diet tinggi lemak dari usia 7-13 minggu. Hiperlipidemia diukur menurut nilai kolesterol total >100 mg/dL dan trigliserida >113 mg/dL dan nilai indeks Lee mendekati 300. Tikus hiperlipidemia dibagi 5 kelompok: EKH(ekstrak etanol kopi hijau 62 mg/KgBB/hari) EKH+EXC (ekstrak etanol kopi hijau 62 mg/KgBB/hari dan latihan fisik intensitas sedang), HD (hiperlipidemia tanpa perlakuan), EXC (latihan fisik intensitas sedang) dan kontrol (tidak hiperlipidemia, tanpa perlakuan). Latihan fisik pada frekuensi 5 kali perminggu, durasi 30 menit. Ekstrak etanol kopi hijau diberikan setiap pagi dan 30 menit sebelum latihan fisik dengan dosis 62 mg/KgBB/hari selama 4 minggu. Pemeriksaan kadar glukosa darah dengan menggunakan *Photometer Mikrolab*. Pengukuran indeks Lee dilakukan setiap minggu. Pewarnaan imunohistokimia dengan menggunakan antibodi anti PPAR- γ . Pengamatan jumlah reseptor sebanyak 5 lapang pandang/slide dihitung dengan software Image J.

Hasil penelitian. Pemberian ekstrak etanol kopi hijau dan latihan fisik (*treatmill*) intensitas sedang selama empat minggu tidak signifikan meningkatkan kadar glukosa darah dan menurunkan persentase PPAR- γ . Pemberian ekstrak etanol dan latihan fisik signifikan menurunkan indeks Lee dan massa lemak abdominal. Latihan fisik (*treatmill*) intensitas sedang tidak signifikan meningkatkan kadar glukosa darah dan persentase PPAR- γ . Latihan fisik (*treatmill*) intensitas sedang tidak signifikan menurunkan indeks Lee dan massa lemak abdominal. Pemberian ekstrak etanol kopi hijau signifikan meningkatkan kadar glukosa darah dan tidak signifikan menurunkan indeks Lee, massa lemak abdominal dan persentase PPAR- γ ($p=0,05$)

Kesimpulan. Dari hasil penelitian, indeks Lee dan massa lemak abdominal signifikan menurun pada kelompok perlakuan kombinasi ekstrak etanol kopi hijau dan latihan fisik intensitas sedang (EKH+EXC). Kadar glukosa darah signifikan meningkat pada kelompok perlakuan ekstrak etanol kopi hijau (EKH).

Kata kunci: hiperlipidemia, kopi hijau, latihan fisik, glukosa, ppar- γ .

ABSTRACT

EFFECT OF ETHANOLIC EXTRACT OF GREEN COFFEE Var. Robusta (*Coffea canephora*) AND MODERATE EXERCISE ON BLOOD GLUCOSE LEVELS, LEE INDEX AND PERCENTAGE OF EXPRESSION Peroxisome Proliferator Activated Receptor- γ (PPAR- γ) IN HYPERLIPIDEMIA RAT MODEL

Background. Excessive food consumption increased of the signaling pathways by lipid metabolites that impaired cellular homeostasis and contribute to cell death. Regulation PPAR- γ receptor is an effort to prevent the build up of lipids and adipogenesis. Physical exercise can reduce the risk cardiovascular disease, hypertension, type 2 diabetes and a tendency to depression. Chlorogenic acid in green coffee beneficial to lose weight, anti-diabetic, anti-inflammatory.

Methods. Rats fed with standard and high-fat diet from the age 7 weeks until 13 weeks. Hyperlipidemia is measure according to the level of total cholesterol > 100 mg/dL and triglycerides >113 mg/dL and value Lee index is 300. Hyperlipidemic rats randomly assigned to 5 groups: HD (untreated hyperlipidemia), control (not hyperlipidemia, without treatment), EKH (ethanolic extract of green coffee 62 mg / KgBW/day), EXC (moderate exercise) and EKH + EXC (ethanolic extract of green coffee 62 mg/Kg/BW/day and given moderate exercise) groups. Moderate exercise (treatmill) is given with frequency of 5 times per week, duration of 30 minutes. Ethanolic extract of green coffee is given every morning and 30 minutes before physical exercise at a dose of 62 mg/Kg/BW/day for 4 weeks. Examination of blood glucose levels using the Photometer Microlab. Measurement of the Lee index is carried out every week. Immunohistochemistry staining using anti PPAR- γ antibodies. Observation of the number of receptors as much as 5 visual fields/slide and calculated by Image J software.

Result. The result showed that four week of ethanolic extract of green coffee in combination with treatmill exercise not significantly increased blood glucose level but significantly decreased Lee index, abdominal fat mass and the treatment also not significantly decreased percentage PPAR- γ . Treatmill exercise not significantly increased blood glucose level, Lee index and abdominal fat mass. Treatmill exercise also not significantly increased percentage PPAR- γ . Ethanolic extract of green coffee only significantly increased blood glucose level. Ethanolic extract of green coffee only not significantly decreased Lee index, abdominal fat mass, and percentage PPAR- γ ($p = 0,05$).

Conclusion. From all indicator above, this experiment showed Lee index and abdominal fat mass of EKH+EXC group was significant. However blood glucose level revealed to be significantly high in EKH group.

Keywords: hyperlipidemia, green coffee, exercise, glucose, PPAR- γ .