

Abstrak

Obesitas sentral meningkatkan resiko kejadian resistensi insulin dan diabetes melitus (DM) jika tidak ditangani segera. Pencegahan DM dapat dilakukan melalui penurunan berat badan, pengaturan asupan makan dan peningkatan aktivitas fisik. Efek diet rendah energi dan rendah indeks glikemik yang pernah diteliti memiliki hasil yang kurang efektif dan kurang implementatif untuk masyarakat. Ubi jalar kuning memiliki potensi sebagai pengganti nasi dengan kelebihanya yaitu kandungan energi dan indeks glikemik lebih rendah dan serat lebih tinggi. Tujuan penelitian ini menganalisis pengaruh diet ubi jalar terhadap biomarker resistensi insulin pada tikus obesitas.

Penelitian ini terdapat 4 kelompok perlakuan. Tikus sebanyak 28 ekor diberikan diet tinggi lemak selama 3 minggu untuk mendapatkan indeks Lee >310, kemudian perlakuan ubi jalar kuning selama 3 minggu. K- diberikan pakan standar AIN 93M saja, K+ diberikan nasi 100% mengganti *corn starch* pada pakan standar, K1 diberikan ubi jalar kuning kukus 100%, dan K2 diberikan 100% ubi jalar kuning kukus dua kali pengukusan. Pemeriksaan darah pre dan post perlakuan dilakukan untuk mengetahui total antioksidan serum dan kadar *glycated albumin* menggunakan metode ELISA, HOMA-IR, dan kadar glukosa postprandial dengan metode GOD-PAP. Analisis data yang digunakan adalah uji *paired sample t-test*, uji *ANOVA* dilanjutkan uji *post hoc*.

Total antioksidan kelompok tikus yang diberi ubi jalar lebih tinggi dari pada tikus yang diberi nasi dan hanya diberi pakan standar. HOMA-IR, kadar *glycated albumin* dan kadar glukosa postprandial tikus yang diberi ubi jalar lebih rendah daripada tikus yang diberi pakan standar dan nasi. Peningkatan terbesar total antioksidan pada K2 sebesar 5,11 U/ml ($p=0,000$), penurunan HOMA-IR paling banyak sebesar 5,67 pada K2 ($p=0,000$), penurunan *glycated albumin* paling banyak sebesar 3,83 pmol/ml pada K2 ($p=0,000$), penurunan glukosa postprandial paling banyak pada K2 sebesar 184 mg/dl ($p=0,000$). Hasil uji anova menunjukkan bahwa terdapat perbedaan signifikan pada total antioksidan ($p=0,000$), HOMA-IR ($p=0,000$), *Glycated Albumin* ($p=0,000$) dan Glukosa Postprandial ($p=0,000$) antarkelompok.

Ubi jalar kuning kukus terbukti meningkatkan total antioksidan, menurunkan HOMA-IR, *glycated albumin*, glukosa postprandial terlebih jika dikukus dua kali.

Kata kunci : antioksidan, HOMA-IR, glukosa postprandial, *glycated albumin*, resistensi insulin, tikus obesitas, ubi jalar kuning

Abstract

Central obesity increases the risk of insulin resistance and diabetes mellitus (DM) if not treated immediately. Prevention of DM can be done through weight loss, regulating dietary intake, and increasing physical activity. The effects of low-calorie and low-glycemic index diets that have been studied have results that are less effective and less implementable for the community. Yellow sweet potato has the potential to substitute rice with its advantages, namely lower calorie content, glycemic index, and higher fiber. This study aimed to analyze the effect of sweet potato diets on biomarkers of insulin resistance in obese rats.

This RCT study contained 4 treatment groups. 28 rats were given a high-fat diet for 3 weeks to get a Lee index > 310, then yellow sweet potato treatment for 3 weeks. K- was given AIN 93M standard diet only, K+ was given 100% rice replacing corn starch in the standard diet, K1 was given 100% steamed yellow sweet potato, and K2 was given 100% steamed yellow sweet potato twice. Pre- and post-treatment blood tests were conducted to determine the effects on serum antioxidant levels and glycated albumin levels using the ELISA method, changes in HOMA-IR, and postprandial glucose levels using the GOD-PAP method. The data analysis used was a paired sample t-test and an ANOVA test followed by post hoc tests.

The total antioxidant levels in the group of rats fed sweet potatoes were higher than those in the rats fed rice and those fed only the standard diet. The HOMA-IR, glycated albumin levels, and postprandial glucose levels in the rats fed sweet potatoes were lower than those in the rats fed the standard diet and rice. The largest increase in total antioxidants in K2 was 5.11 U/ml ($p=0.000$), the most decrease in HOMA-IR was 5.67 in K2 ($p=0.000$), the most decrease in glycated albumin was 3.83 pmol/ml in K2 ($p=0.000$), the most decrease in postprandial glucose in K2 was 184 mg/dl ($p=0.000$). The ANOVA results demonstrated significant differences among the groups in total antioxidant levels ($p = 0.000$), HOMA-IR ($p = 0.000$), glycated albumin ($p = 0.000$), and postprandial glucose levels ($p = 0.000$).

Steamed yellow sweet potato is proven to increase total antioxidants, and reduce HOMA-IR, glycated albumin, and postprandial glucose especially if steamed twice.

Keywords: antioxidant, HOMA-IR, glycated albumin, insulin resistance, obese rats, postprandial glucose, yellow sweet potato