Korelasi massa lemak tubuh dan sensitivitas insulin pada pekerja Kantor Obesitas Di RSUPN Dr. Cipto Mangunkusumo = Correlation between body fat mass and insulin sensitivity among Obese Office workers at Dr. Cipto Mangunkusumo National Hospital

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Abstrak

Latar Belakang: Pegawai kantor dengan obesitas memiliki risiko tinggi mengalami diabetes melitus (DM) tipe 2. Pemeriksaan sensitivitas insulin jarang dilakukan karena kendala teknis dan biaya. Berbagai studi sebelumnya menunjukkan adanya hubungan negatif antara massa lemak tubuh dengan HOMA-IR, namun hasil penelitian di Indonesia menunjukkan hasil yang tidak konsisten. Indeks TyG disebut sebagai penanda resistensi insulin yang lebih akurat jika dibandingkan dengan HOMA-IR pada populasi Asia. Belum ada penelitian yang menilai hubungan massa lemak tubuh dengan Indeks TyG di Indonesia.
Metode: Studi potong lintang dilakukan pada 89 pekerja kantor dengan obesitas (IMT 25 kg/m2) tanpa riwayat DM di RSUPN Dr. Cipto Mangunkusumo, Jakarta, pada bulan Agustus hingga Oktober tahun 2022. Dilakukan pengambilan data demografis (usia, jenis kelamin, riwayat DM, kebiasaan merokok), antropometri, analisis asupan menggunakan 24-hour food recall 3x24 jam, serta penilaian tingkat aktivitas fisik berdasarkan Global Physical Activity Questionnaire Score. Pengukuran persentase lemak tubuh total dan massa lemak viseral menggunakan multi-frequency bioelectrical impedance analysis (BIA) SECA mBCA-525. Sensitivitas insulin dinilai menggunakan kadar HOMA-IR dan Indeks TyG serum. Analisis korelasi menggunakan uji Spearman dan dilakukan analisis multivariat untuk menilai faktor-faktor yang paling berhubungan dengan sensitivitas insulin.
Hasil: Didapatkan sebanyak 89 subjek dengan proporsi perempuan:laki-laki sekitar 2:1, median usia 40 (21-59) tahun, dan mayoritas memiliki tingkat aktivitas sedang, tidak memiliki riwayat DM pada keluarga, tidak merokok, serta memiliki persentase kecukupan asupan melebihi kebutuhan energi individual dengan persentase makronutrien masih masuk dalam rentang normal. Korelasi persentase lemak tubuh total dengan HOMA-IR menunjukkan korelasi positif lemah yang bermakna (r=0,262, p=0,013). Korelasi massa lemak viseral dengan Indeks TyG menunjukkan korelasi positif lemah yang bermakna (r=0,234, p=0,027). Hasil korelasi persentase lemak tubuh total dengan indeks TyG dan korelasi massa lemak viseral dengan HOMA-IR menunjukkan hasil yang tidak signifikan secara statistik. Persentase lemak tubuh total tidak berhubungan signifikan dengan HOMA-IR setelah disesuaikan dengan variabel jenis kelamin, tingkat aktivitas fisik, indeks massa tubuh, lemak viseral, trigliserida, HDL, lingkar pinggang, dan persentase asupan karbohidrat. Massa lemak viseral tidak berhubungan signifikan dengan Indeks TyG setelah disesuaikan dengan variabel usia, jenis kelamin, lemak viseral, persentase asupan protein, dan HDL.
Kesimpulan: Didapatkan korelasi positif lemah antara persentase lemak tubuh total dengan HOMA-IR dan korelasi positif lemah antara massa lemak viseral dengan Indeks TyG pada pegawai kantor obesitas di RSUPN Cipto Mangkunsumo.
.....Background: Obese office workers have a high risk of developing type 2 diabetes mellitus (DM). Insulin sensitivity tests are rarely performed due to technical and cost constraints. Previous studies have shown a negative relationship between body fat mass and HOMA-IR. However, the results of research in Indonesia

have shown inconsistent results. No study has assessed the relationship between body fat mass and the TyG index in Indonesia. In contrast, some research showed that The TyG index is a more accurate marker of insulin resistance in Asian populations.
Methods: A cross-sectional study was conducted on 89 office workers with obesity (BMI 25 kg/m2) without a history of DM at RSUPN Dr. Cipto Mangunkusumo, Jakarta, on August-October 2022. Demographic data were collected (age, gender, history of DM, smoking habits), anthropometry, analysis of energy intake and macronutrients using a 3- days 24-hour food recall, as well as an assessment of the level of physical activity based on the Global Physical Activity Questionnaire Score. The total body fat percentage and visceral fat mass were measured using a multi-frequency bioelectrical impedance analysis (BIA) SECA mBCA-525. Insulin sensitivity was assessed using HOMA-IR levels and serum TyG Index. Correlation analysis used the Spearman test, and multivariate analysis was performed to assess the factors most related to insulin sensitivity.
Results: There were 89 subjects with a proportion of women: men around 2:1, the median age was 40 (21-59) years, and the majority had moderate activity levels, had no family history of DM, did not smoke, and had intakes exceeding individual energy needs with the percentage of macronutrients within normal range. The total body fat percentage correlation with HOMA-IR showed a significant positive correlation with weak strength (r=0.262, p=0.013). The correlation of visceral fat mass with the TyG index showed a significant positive correlation with weak strength (r=0.234, p=0.027). The results of the correlation of total body fat percentage with the TyG index and the correlation of visceral fat mass with HOMA-IR showed results that were not statistically significant. The total body fat percentage was not significantly related to HOMA-IR after adjusting for variables such as gender, level of physical activity, body mass index, visceral fat, triglycerides, HDL, waist circumference, and percentage of carbohydrate intake. Visceral fat mass did not have a significant relationship with the TyG index after adjusting for age, sex, visceral fat, percentage of protein intake, and HDL.
Conclusion: A weak positive correlation was found between the percentage of total body fat and HOMA-IR and a weak positive correlation between visceral fat mass and the TyG index in obese office workers at Cipto Mangkunsumo General Hospital.