

Abstrak

Hubungan antara Indeks Trigliserida Glukosa dengan Disfungsi Diastolik, Disfungsi Sistolik dan Perubahan Struktur Ventrikel Kiri Jantung pada Diabetes Melitus Tipe 2

Saiful Anam¹, Hemi Sinorita¹, Hasanah Mumpuni²

¹Devisi Endokrinologi Metabolik dan Diabetes Departemen Ilmu Penyakit Dalam, RSUP Dr. Sardjito/FK-KMK UGM Yogyakarta

²Departemen Kardiologi, RSUP Dr. Sardjito/FK-KMK UGM Yogyakarta

Latar belakang: Diabetes melitus (DM) penyebab utama gagal jantung. Prevalensi gagal jantung pada pasien DM 22,3%. Resistensi insulin pada DM tipe 2 adalah faktor risiko disfungsi diastolik, disfungsi sistolik dan perubahan struktur ventrikel jantung. Indeks trigliserida-glukosa (Indeks TyG) merupakan alternatif penilaian resistensi insulin yang sederhana dan relatif baru.

Metode: Penelitian potong lintang ini bertujuan untuk mengetahui hubungan indeks TyG dengan disfungsi diastolik, disfungsi sistolik dan perubahan struktur ventrikel kiri jantung. Penelitian dilakukan terhadap 56 pasien DM tipe 2 tidak terkontrol tanpa gejala kardiovaskuler, usia 30-65 tahun di Poliklinik Endokrin RSUP Dr Sardjito Yogyakarta periode 1 Mei 2024 sampai 31 Oktober 2024. Ekokardiografi dilakukan untuk menilai disfungsi dan perubahan struktur ventrikel jantung. Indeks TyG dihitung dengan formula, Indeks TyG: $\ln [\text{trigliserida darah puasa (mg/dL)} \times \text{glukosa darah puasa (mg/dL)} / 2]$. Uji regresi logistik digunakan untuk menilai hubungan variabel bebas dengan keluaran.

Hasil: Sebanyak 56 subyek diikuti penelitian. Ekokardiografi fungsi diastolik didapatkan 66% normal, 28,6% disfungsi diastolik grade 1; 3,6% disfungsi diastolik grade 2 dan 1,8% disfungsi diastolik grade 3. Ekokardiografi terhadap fungsi sistolik didapatkan median fraksi ejeksi 68% (22-79%), yang meliputi 80,3% fraksi ejeksi normal (EF > 50), 5,4% fraksi ejeksi 41-49, dan 14,3% fraksi ejeksi < 40. Ekokardiografi terhadap perubahan struktur ventrikel kiri didapatkan 67,8% geometri normal, 14,3% remodeling konsentrik, 14,3% hipertrofi konsentrik dan 3,6% hipertrofi eksentrik. Tidak terdapat hubungan indeks TyG terhadap disfungsi diastolik dan disfungsi sistolik ($p = 0,512$ dan $p = 0,838$). Uji regresi logistik didapatkan indeks TyG, kadar asam urat dan obesitas berhubungan dengan perubahan struktur ventrikel kiri jantung, dengan OR 10,716, $p = 0,037$ (CI 95%: 1,159-99,290); OR 2,136, $p = 0,011$ (CI 95%: 1,190-3,837); dan OR 0,022, $p = 0,003$ (CI 95%: 0,002-0,273).

Kesimpulan: Terdapat hubungan indeks TyG tinggi dengan perubahan struktur ventrikel kiri pada DM tipe 2. Tidak terdapat hubungan indeks TyG dengan disfungsi diastolik dan sistolik ventrikel kiri pada DM tipe 2.

Kata kunci: Indeks TyG, resistensi insulin, disfungsi ventrikel kiri, perubahan struktur.

Abstract

Association between Triglyceride-Glucose Index with Diastolic Dysfunction, Systolic Dysfunction and Left Ventricular Remodeling in Type 2 Diabetes Mellitus

Saiful Anam¹, Hemi Sinorita¹, Hasanah Mumpuni²

¹Endocrinology Metabolism and Diabetes Division, Department of Internal Medicine, Dr. Sardjito General Hospital/FK-KMK UGM Yogyakarta

²Department of Cardiology, Dr. Sardjito General Hospital/FK-KMK UGM Yogyakarta

Background: Diabetes mellitus (DM) is the main cause of heart failure. Prevalence of heart failure in DM patients is 22.3%. Insulin resistance in type 2 DM is risk factor for diastolic dysfunction, systolic dysfunction and left ventricular remodeling. TyG Index is a simple and relatively new for alternative assessing insulin resistance.

Methods: The aim of this cross-sectional study was to determine association between TyG index with diastolic dysfunction, systolic dysfunction and left ventricular remodeling. This study was conducted on 56 patients with uncontrolled type 2 DM without cardiovascular symptoms, 30-65 years old at Endocrine Polyclinic Sardjito General Hospital Yogyakarta, period May^{1st} to October^{31st} 2024. Echocardiography was performed to assess ventricular dysfunction and left ventricular remodeling. TyG index is calculated with formula, TyG index: $\ln [\text{fasting blood triglycerides (mg/dL)} \times \text{fasting blood glucose (mg/dL)} / 2]$. Logistic regression test is used to assess association between independent variables and outcome.

Results: A total 56 subjects were included in this study. Echocardiography results of diastolic function showed 66.0% normal, 28.6% grade 1 diastolic dysfunction, 3.6% grade 2 diastolic dysfunction and 1.8% grade 3 diastolic dysfunction. Echocardiography results of systolic function were in median ejection fraction of 68% (22-79%), which included 80,3% normal ejection fraction (EF > 50), 5,4% ejection fraction 41-49, and 14.3% ejection fraction < 40. Echocardiography of left ventricular remodeling showed 67.8% normal geometry, 14.3% concentric remodeling, 14.3% concentric hypertrophy and 3.6% eccentric hypertrophy. There were no association between TyG index on diastolic dysfunction and systolic dysfunction ($p = 0.512$ and $p = 0.838$). Logistic regression tests fined that TyG index, uric acid levels and obesity were associated with left ventricular remodeling with OR 10,716, $p = 0.037$ (CI 95%: 1.157-99,290); OR 2,136, $p = 0.011$ (CI 95%: 1.190-3.837); and OR 0.022, $p = 0.003$ (CI 95%: 0.002-0.273).

Conclusion: There is association between high TyG index and left ventricular remodeling in type 2 DM. There were no association between TyG index with left ventricular diastolic and systolic dysfunction in type 2 DM patients.

Keywords: TyG index, insulin resistance, left ventricular dysfunction, remodeling.