

Hubungan antara Short Chain Fatty Acid dengan Gambaran Ultrasonografi Arteri Karotis Interna pada Penderita Diabetes Melitus Tipe 2 = The correlation between short-chain fatty acid and ultrasonography of the internal carotid artery in type 2 diabetes mellitus

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Abstrak

Latar Belakang: Peningkatan prevalensi penderita diabetes melitus (DM) meningkatkan risiko aterosklerosis arteri karotis interna (internal carotid artery, ICA). Di negara maju, 85% kasus stroke terjadi akibat aterosklerosis karotis. Short chain fatty acid (SCFA) adalah produk metabolisme bakteri yang terutama disintesis di usus besar dan berperan mengurangi aktivasi endotel oleh mediator proinflamasi. Sehingga mencegah progresi aterosklerosis ICA. Penelitian ini bertujuan mengetahui hubungan SCFA feses dengan gambaran ultrasonografi ICA pada penderita DM tipe 2 di RS Dr. Cipto Mangunkusumo (RSCM).

Metode: Desain penelitian ini adalah observasional analitik jenis potong lintang. Data diperoleh dari seluruh pasien DM tipe 2 di Divisi Bedah Vaskular dan Endovaskular RSCM. Meliputi kadar SCFA sampel feses dan gambaran ultrasonografi (carotid intima-media thickness (IMT), diameter lumen, peak systolic velocity (PSV), end diastolic velocity (EDV), dan flow volume). Uji korelasi Spearman dilakukan untuk memperoleh koefisien korelasi. Nilai $p < 0,05$ bermakna signifikan.

Hasil: Dari 30 subjek DM tipe 2, terdapat 12 laki-laki (40,0%) dan setengah populasi berusia >60 tahun. Hasil pemeriksaan IMT berhubungan signifikan dengan jenis kelamin ($p=0,048$). Kadar SCFA berhubungan signifikan dengan usia, yaitu asetat ($p=0,029$), proprionat ($p=0,005$), butirat ($p=0,039$), dan SCFA total ($p=0,024$). Kadar SCFA valerat berkorelasi signifikan dengan IMT ($r = -0,237$; $p=0,034$) dan diameter lumen ($r = -0,243$; $p=0,031$).

Kesimpulan: Kadar SCFA feses berkorelasi dengan gambaran ultrasonografi arteri karotis interna. Nilai kadar SCFA feses pada pasien DM tipe 2 di RSCM lebih tinggi dibandingkan penelitian lain. Peningkatan kadar SCFA menurunkan risiko penyempitan arteri sklerosis interna

.....Background: The increasing prevalence of diabetes mellitus (DM) increases the risk of atherosclerosis of the internal carotid artery (ICA). In developed countries, 85% of stroke cases occur due to carotid atherosclerosis. Short-chain fatty acids (SCFA) are products of bacterial metabolism which are mainly synthesized in the large intestine and play a role in reducing endothelial activation through pro-inflammatory mediators, thus preventing the progression of ICA atherosclerosis. This study aims to determine the correlation between faecal SCFA and ICA ultrasonography in patients with type 2 diabetes at Dr. Cipto Mangunkusumo General Hospital (CMGH).

Methods: This study is cross-sectional. Data were obtained from all type 2 DM patients in the Vascular and Endovascular Surgery Division. Data that were collected included faecal SCFA levels and ultrasonography examination (carotid intima-media thickness (IMT), lumen diameter, peak systolic velocity (PSV), end-diastolic velocity (EDV), and flow volume). Spearman correlation test was conducted to obtain the correlation coefficient. The p -value < 0.05 was significant.

Results: Of the 30 subjects, 12 were male (40.0%) and half the population was >60 years old. BMI examination results were significantly related to gender ($p=0.048$). SCFA levels were significantly related to

age, including acetate ($p=0.029$), propionate ($p=0.005$), butyrate ($p=0.039$), and total SCFA ($p=0.024$). SCFA valerate levels were significantly correlated with BMI ($r = -0.237$; $p=0.034$) and lumen diameter ($r = -0.243$; $p=0.031$).

Conclusion: Fecal SCFA levels correlated with ultrasound images of the internal carotid artery. The value of faecal SCFA levels in type 2 DM patients at CMGH was higher than in other studies. Elevated SCFA levels decrease the risk of ICA narrowing or stenosis.