Hubungan Kebiasaan Diet Tinggi Asam Lemak Trans dengan Kadar Brain Derived Neurotrophic Factor dan Hubungannya dengan Status Hipertensi pada Populasi di Natuna = Association between High Trans Fatty Acid Dietary Habit with Brain Derived Neurotrophic Factor Level and Hypertension on Natuna District Population

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Abstrak

Latar belakang: Sebagai salah satu penyebab hipertensi, pengaruh langsung asupan asam lemak trans masih belum diketahui dengan pasti. Konsumsi jangka panjang dapat mengakibatkan inkorporasi asam lemak trans di membran neural otak yang dapat memengaruhi jalur sinyal neurotrophin, termasuk Brain Derived Neurotrophic Factor (BDNF). Sebagai neurotrophin yang terdapat di berbagai bagian dari tubuh, BDNF diperkirakan memiliki peran dalam pengaturan tekanan darah.
Tujuan: Mengetahui apakah terdapat hubungan antara asupan asam lemak trans dan kadar BDNF terhadap hipertensi di Kabupaten Natuna.
Metode: Studi potong lintang analitik ini menggunakan data sekunder hasil anamnesis, pemeriksaan fisik, dan food recall yang dilakukan oleh tenaga kesehatan di Kabupaten Natuna pada Juli 2019, serta data primer berupa pemeriksaan kadar BDNF dari sampel darah yang sudah tersimpan di laboratorium RSPJDHK pada bulan September 2019. Hasil: Terdapat 181 penduduk Natuna yang memenuhi kriteria inklusi dan eksklusi. Median asupan asam lemak trans subjek dengan hipertensi lebih tinggi dibandingkan kontrol (0,013: 0,0003 – 0,07 vs 0,010: 0,0006 – 0,06, p = 0,021). Analisis statistik menunjukkan bahwa interaksi kadar BDNF dengan asupan asam lemak trans memiliki efek modifikasi terhadap asupan asam lemak trans dan hipertensi (p = 0,011). Pada total subjek, asupan asam lemak trans memiliki OR 1,81 IK95% 1,10-2,99 p 0,020, namun OR 3,63 IK95% 1,69-7,77 p 0,001 pada BDNF di tertile bawah dan sedang. Uji analisis multivariat menunjukkan bahwa hasil tersebut tidak dipengaruhi oleh faktor perancu.
Kesimpulan: Kadar BDNF memiliki efek modifikasi terhadap hubungan asupan asam lemak trans dan hipertensi, di mana peningkatan probabilitas hipertensi seiring penambahan asupan asam lemak trans hanya terjadi pada subjek dengan kadar BDNF rendah.
.....Background: As one of the major cause of hypertension, direct effect of trans fat intake and hypertension is not yet illuminated. Long-term consumption has been linked with trans fat incorporation in brain neural membrane that could lead into alteration of signaling pathways, including Brain Derived Neurotrophic Factor (BDNF). As an ubiquitous neurotrophin, BDNF is believed to play a role in the regulation of blood pressure.
Objective: This study aimed to investigate the association between trans fat intake and BDNF level with hypertension in the population of Natuna.
Methods: This analytical cross-sectional study is using a secondary data including demographic data, physical examination, and food recall obtained from Natuna district population in July 2019. Primary data of BDNF level was obtained through analysis of blood samples stored in National Cardiovascular Center Harapan Kita (NCCHK) in September 2019.
Results: A total of 181 samples were obtained in this study. Compared to normontesive subjects, median of

daily trans fat intake of hypertensive subjects was higher (0,013: 0,0003 – 0,07 vs 0,010: 0,0006 – 0,06, p 0,021). Statistitical analysis showed that plasma BDNF level has a modyfing effect in relationship of trans-fat intake and hypertension (p 0,011). In cumulative subjects, trans-fat showed an odds ratio (OR) of 1,81 95%CI 1,10-2,99 p 0,020, while the OR for those with low-middle tertile BDNF level was 3,63 95%CI 1,69-7,77 p 0,001. Further multivariate analysis showed that the interaction was statistically significant after adjustment to confounding factors.

Conclusion: Plasma BDNF level has a modifying effect in the relationship between trans-fat intake and hypertension. Increased probability of hypertension in accordance with trans-fat intake only occurred in subjects with low level plasma BDNF.