INTISARI

Latar Belakang: Dislipidemia menyebabkan hipoksia dan peningkatan pelepasan asam lemak bebas dari jaringan adiposa melalui lipolisis yang menstimulasi peningkatan ekspresi gen TLR4, NFκβ dan ICAM-1 yang menyebabkan peningkatan sekresi TNF-α, IL-6 dan ICAM-1. Serat diketahui dapat menghambat lipolisis, sehingga dapat menurunkan ekspresi gen dan kadar sitokin proinflamasi serta molekul adhesi pada tikus dislipidemia.

Metode: Sebanyak 25 ekor tikus jantan galur Wistar dikelompokkan menjadi 1) Kontrol normal; 2) Kontrol dislipidemia; 3) dislipidemia dengan 1,04 g serat/tikus/hari (P1); 4) dislipidemia dengan 2,07 g serat/tikus/hari (P2) dan 5) dislipidemia dengan 3,11 g serat/tikus/hari (P3). Kelompok 2,3,4 dan 5 diinduksi diet tinggi lemak dan fruktosa selama 7 minggu, dilanjutkan dengan pemberian diet tinggi serat (P1, P2, dan P3) selama 6 minggu dengan menggunakan sumber serat labu kuning dan ubi jalar orange. Pengukuran kadar TNF-α, IL-6 dan ICAM-1 dilakukan sebelum dan setelah perlakuan, dan diakhir penelitian dilakukan analisis ekspresi gen TLR4, NFκβ dan ICAM-1 pada jaringan adiposa putih tikus.

Hasil: Pemberian diet tinggi serat dapat menurunkan ekspresi gen TLR4, NFκβ dan ICAM-1 ($p<0,05$) jika dibandingkan dengan kelompok normal dan dislipidemia, pengecualian untuk ekspresi gen ICAM-1 lebih tinggi jika dibandingkan dengan kelompok normal pada kelompok P1. Kadar TNF-α, IL-6 dan ICAM-1 terjadi penurunan ($p<0,05$) setelah perlakuan jika dibandingkan dengan kelompok dislipidemia tanpa pemberian diet serat. Rerata penurunan tertinggi terlihat pada kelompok P2 dengan pemberian total serat 2,07 g/tikus/hari.

Kesimpulan: Diet tinggi serat dapat menurunkan ekpresi gen TLR4, NFκβ dan ICAM-1 serta kadar TNF-α, IL-6 dan ICAM-1 pada tikus yang diinduksi diet tinggi lemak dan fruktosa.

Kata kunci: diet tinggi serat, TLR4, NFκβ, ICAM-1, TNF-α, IL-6, diet tinggi lemak dan fruktosa

ABSTRACT

Background: Dyslipidemia causes hypoxia and increases the release of free fatty acids from adipose tissue through lipolysis which stimulates an increases TLR4, NFκβ, and ICAM-1 expression thereby increased of TNF-α, IL-6, and ICAM-1 secretion. Fibers were known to be able to impede lipolysis which can reduce gene expression and levels of cytokine proinflammation as well as adhesion molecules on dyslipidemia rats.
Methods: A total 25 male Wistar rats were divided into 1) normal, 2) dyslipidemia, 3) dyslipidemia+P1 (1.04 g of fiber/rat/day), 4) dyslipidemia+P2 (2.07 g of fiber/rat/day) and 5) dyslipidemia+P3 (3.11 g of fiber/rat/day). The groups of 2,3,4 and 5 were given a high fat and fructose diet for 7 weeks. Then, high fiber diet was given (P1, P2, P3) for six weeks with pumpkin and sweet potato as fiber source. Measurement of TNF-α, IL-6, and ICAM-1 levels was done before and after treatments. At the end of experiment, the white adipose tissue of rats to be analyzed for TLR4, NFκβ dan ICAM-1 gene expression.
Results: The administration of the high fiber diet resulted in suppressing the expression of TLR4, NFκβ, and ICAM-1 ($p<0.05$) if compared with the normal and dyslipidemia groups, except of the ICAM-1 expression on P1 was higher than the normal. The findings also indicated decreased TNF-α, IL-6, and ICAM-1 levels ($p<0.05$) after treatments if compared with dyslipidemia group. The highest reduction was seen in P2 group with 2.07 g content of fiber/rat/day.
Conclusion: High fiber diet was able to decrease TLR4, NFκβ, and ICAM-1 expression as well as TNF-α, IL-6, and ICAM-1 levels on rats induced with high fat and fructose diet.

Keywords: high fiber diet, TLR4, NFκβ, ICAM-1, TNF-α, IL-6, high fat and fructose diet