INTISARI

Hubungan Inflamasi di Jaringan Adiposa dengan Inflamasi dan Apoptosis di Ginjal pada Tikus Model Obesitas Induksi Diet Tinggi Lemak

Latar belakang: Diet tinggi lemak menyebabkan obesitas serta memicu adiposit di jaringan adiposa mengalami hipertrofi. Adiposit hipertrofi melepaskan sitokin proinflamasi dan asam lemak bebas melalui proses lipolisis. Asam lemak bebas mampu menyebabkan lipotoksisitas yang berdampak buruk pada ginjal.
Tujuan: Penelitian inimengkaji ekspresi mRNAIL-6 dan MCP-1 di jaringan adiposa serta mRNA TLR4, MCP-1 dan Caspase-3 di ginjal pada tikus model obesitas dengan pemberian diet tinggi lemak selama 1 bulan, 2 bulan dan 4 bulan.
Metode: Tikus obesitas diinduksi oleh diet tinggi lemak selama 1 bulan (OB1), 2 bulan (OB2) dan 4 bulan (OB4) sebagai kelompok perlakuan serta pada kelompok kontrol diberi pakan standar AIN76A. Komposisi diet tinggi lemak kelompok perlakuan adalah 21.2% protein, 24% karbohidrat dan 54.8% lemak. Pengambilan data berat badan, kadar kreatinin dan isolasi RNA pada jaringan adiposa subkutan abdomen maupun ginjal dilakukan diakhir penelitian. *Reverse Transcription-PCR* (RT-PCR) untuk mengetahui ekspresi mRNAIL-6, MCP-1, TLR-4 dan Caspase-3.
Hasil: Hasil penghitunganindek Leeantara kelompok kontrol dan perlakuan terdapat perbedaan signifikan ($p<0,05$). Ekspresi mRNA MCP-1 dan IL-6 di jaringan adiposa berbeda signifikan antara kelompok kontrol dan perlakuan ($p<0,05$) kecuali ekspresi IL-6 pada OB1. Sedangkan ekspresi mRNATLR-4 dan MCP-1 di ginjalberbeda signifikan hanya pada OB4($p<0,05$), namun tidak signifikan pada OB1 dan OB2 meskipun terjadi peningkatan ($p>0,05$). Ekspresi mRNA Caspase-3 di ginjal berbeda signifikan antara kelompok kontrol dan perlakuan ($p<0,05$). Kadar kreatininuntuk menilai fungsi ginjal menunjukkan perbedaan signifikan antara kelompok kontrol dan perlakuan ($p<0,05$).
Kesimpulan: Induksi diet tinggi lemak selama 1 bulan memicu ekspresi mRNA MCP-1 di jaringan adiposa subkutan abdomen serta Caspase-3 di ginjal secara signifikan, sedangkan ekspresi mRNAIL-6 di jaringan adiposa subkutan abdomen serta MCP-1 dan TLR-4 di ginjal secara signifikan terpicu setelah induksi selama 2 dan 4 bulan.

Kata kunci: obesitas, jaringan adiposa, ginjal, inflamasi, apoptosis

ABSTRACT

The Links between Inflammation in Adipose Tissue with Inflammation and Apoptotic in Kidney on High-Fat Diet-Induced Obese Model

Background:A high-fat diet causes obesity and trigger adipocytes in the adipose tissue to hypertrophy. Hypertrophic adipocytes release proinflammatory cytokines and free fatty acids through the lipolysis process. Free fatty acids cause lipotoxicity which adversely affectsthe kidneys.

Objective: This study examined the mRNA expressions of IL-6 and MCP-1 in adipose tissue and TLR-4, MCP-1 and Caspase-3 in the kidneys in obese rats with a high-fat diet for 1 month, 2 months and 4 months.

Methods: Obesity was induced by a high-fat diet for 1 month (OB1), 2 months (OB2) and 4 months (OB4) as a treatment group, while a control group was given AIN76A standard feed. The composition of the high-fat diet was 21.2% protein, 24% carbohydrates and 54.8% fat. Data collection of body weight, creatinine levels and RNA isolation in adipose tissue and kidney were carried out at the end of the study. Reverse Transcription-PCR (RT-PCR) was performed to determine the mRNA expressions of IL-6, MCP-1, TLR-4 and Caspase-3.

Results: Lee indexcalculation between the control and treatment groups were significantly increased ($p < 0.05$). The expression of MCP-1 and IL-6 in adipose tissue were significantly increased between the control and treatment groups ($p < 0.05$) except for IL-6 expression in OB1. Meanwhile, the results of TLR-4 and MCP-1 expression in the kidney showed significantly different in OB4 ($p < 0.05$), but not significant in OB1 and OB2 although there was an increase ($p > 0.05$). The expression of Caspase-3 in the kidney significantly increased between the control and treatment groups ($p < 0.05$). There was a significant difference in creatinine levels between the control and treatment groups ($p < 0.05$).

Conclusion: Induction of a high-fat diet for 1 month significantly triggered the mRNA expression of MCP-1 in adipose tissue and Caspase-3 in the kidney, whereas IL-6 expression in adipose tissue as well as MCP-1 and TLR-4 in kidney significantly increase after induction for 2 and 4 months.

Key words: obesity, adipose tissue, kidney, inflammation, apoptosis.