

INTISARI

Latar Belakang: Diabetes mellitus dapat menyebabkan terjadinya inflamasi kronis salah satunya dengan melibatkan faktor transkripsi NF- κ B, dan sitokin proinflamasi IL-1 β dan TNF- α pada testis. Inflamasi kronis pada testis dapat menyebabkan infertilitas yang ditandai oleh atrofi testis. Asam klorogenat telah diketahui efek anti-inflamasinya pada berbagai penelitian. Namun, tidak banyak penelitian yang meneliti pengaruh asam klorogenat terhadap ekspresi NF- κ B, IL-1 β dan TNF- α pada testis.

Tujuan: Mengkaji bagaimana pengaruh asam klorogenat terhadap ekspresi mRNA NF- κ B, IL-1 β dan TNF- α pada testis tikus model diabetes mellitus.

Metode: Penelitian kuasi eksperimental dengan desain *post-test only control group*. *Ratus norvegicus* jantan (n=24-30, berat 150-250 g) dibagi menjadi enam kelompok: Kontrol non-DM (C), STZ terminasi bulan ke-1.5 (DM 1.5), STZ terminasi bulan ke-2 (DM 2), STZ + CGA 12,5mg/kgBB (CGA 1), STZ + CGA 25 mg/kgBB (CGA 2), dan STZ + CGA 50 mg/kgBB (CGA 3). CGA diinjeksikan selama 14 hari secara intraperitoneal dan kelompok CGA diterminasi pada bulan ke-2. Dilakukan pengambilan sampel untuk ekstraksi RNA dari organ testis. Ekspresi mRNA NF- κ B, IL-1 β , dan TNF- α diukur menggunakan RT-PCR. Analisis densitometri menggunakan *software ImageJ*[®].

Hasil: Ekspresi mRNA NF- κ B pada kelompok CGA 1 lebih rendah bermakna dibandingkan dengan kelompok DM 1.5 dan DM 2 ($p < 0,05$) dan ekspresi mRNA NF- κ B CGA 2 lebih rendah bermakna dibandingkan kelompok DM 2 ($p < 0,05$). Ekspresi mRNA IL-1 β lebih rendah tidak bermakna pada kelompok CGA dibandingkan dengan kelompok DM. Ekspresi mRNA TNF- α lebih rendah bermakna pada kelompok CGA 1 dan CGA 3 dibandingkan dengan kelompok DM 1.5 dan DM 2 ($p < 0,05$). Perbedaan dosis CGA bermakna pada ekspresi mRNA TNF- α .

Kesimpulan: Asam klorogenat berpotensi mengurangi inflamasi pada testis tikus diabetes mellitus dengan menurunkan ekspresi mRNA NF- κ B, IL-1 β , dan TNF- α . Efektifitas protektif asam klorogenat terhadap inflamasi bergantung pada dosis asam klorogenat yang diberikan.

Kata Kunci: Diabetes Mellitus, Inflamasi, Testis, Asam Klorogenat

ABSTRACT

Background: Diabetes mellitus can cause chronic inflammation, one of which involves the transcription factor NF- κ B, and proinflammatory cytokines IL-1 β and TNF- α in the testes. Chronic inflammation of the testes can cause infertility marked by testicular atrophy. Chlorogenic acid has known for its anti-inflammatory effects in various studies. However, not many studies have investigated the effect of chlorogenic acid on the expression of NF- κ B, IL-1 β and TNF- in the testes.

Purpose: To study the effect of chlorogenic acid on the expression of NF- κ B, IL-1 β and TNF- α in diabetes mellitus-induced rat testicular inflammation.

Method: A quasi-experimental study with a post-test only control group design. Male *Ratus norvegicus* (n=24-30, weight 150-250 g) were divided into six groups: non-DM control (C), STZ terminated in month 1.5 (DM 1.5), STZ terminated in month 2 (DM 2), STZ + CGA 12.5 mg/kgBW (CGA 1), STZ + CGA 25 mg/kgBW (CGA 2), and STZ + CGA 50 mg/kgBW (CGA 3). CGA was injected intraperitoneally for 14 days and the CGA group was terminated at month 2. Samples were taken for extraction of RNA from testis. The mRNA expression of NF- κ B, IL-1 β , and TNF- α was measured using RT-PCR. Densitometric analysis using ImageJ[®] software.

Result: The NF- κ B mRNA expression in the CGA 1 group was significantly lower than that in the DM 1.5 and DM 2 groups ($p < 0.05$) and the NF- κ B CGA 2 mRNA expression was significantly lower than the DM 2 group ($p < 0.05$). IL-1 β mRNA expression was not significantly lower in the CGA group compared to the DM group. TNF- α mRNA expression was significantly lower in the CGA 1 and CGA 3 groups compared to the DM 1.5 and DM 2 groups ($p < 0.05$). The difference in CGA dose was significant in the expression of TNF- α mRNA.

Conclusion: Chlorogenic acid has the potential to reduce inflammation in the testes of diabetic rats by decreasing the mRNA expression of NF- κ B, IL-1 β , and TNF- α . The protective effectiveness of chlorogenic acid against inflammation depends on the dosage of chlorogenic acid given.

Keyword: Diabetes Mellitus, Inflammation, Testis, Chlorogenic Acid