

## INTISARI

**Latar belakang :** Diabetes merupakan penyakit metabolik yang ditandai dengan hiperglikemia sehingga memicu stres oksidatif. *Alpha Lipoic Acid* (ALA) dapat digunakan untuk menekan peningkatan stres oksidatif dan suplementasi kafein dapat digunakan untuk melindungi sel  $\beta$  pankreas pada kondisi diabetes. Penelitian ini dilakukan untuk mempelajari efek suplementasi kafein dan ALA terhadap status stres oksidatif pada organ hepar tikus diabetes dengan melihat kadar Malondialdehid (MDA) dan Glutathion Peroksidase-1 (GPx-1) sebagai parameter.

**Metode :** Penelitian ini menggunakan desain eksperimen dengan rancangan *post test only with control group design*. Subjek penelitian sebanyak 30 ekor *Wistar* jantan dibagi menjadi 5 kelompok : Normal (N), Diabetes (D), Diabetes+Kafein (DK), Diabetes+ALA (DA), Diabetes+Kafein+ALA (DKA). Kelompok diabetes diinduksi menggunakan *Streptozotocin* (STZ) 60 mg/kg berat badan. Suplementasi kafein (60 mg/kg berat badan) dan ALA (50 mg/kg berat badan) diberikan setiap hari selama 6 minggu. Uji kadar MDA dan GPx-1 menggunakan teknik ELISA.

**Hasil :** Kadar MDA hepar kelompok DKA tidak berbeda ( $p>0,05$ ) dibandingkan kadar MDA hepar kelompok N. Tidak ditemukan perbedaan bermakna pada kadar MDA hepar kelompok DKA ( $72,56\pm 17,82$ ) dibandingkan kadar MDA hepar kelompok D ( $95,15\pm 7,98$ ). Kadar GPx-1 hepar kelompok DKA ( $80,91\pm 15,37$ ) juga tidak berbeda bermakna dibandingkan kadar GPx-1 hepar kelompok D ( $66,81\pm 10,19$ ). **Kesimpulan :** Penelitian ini tidak menunjukkan perbedaan ( $p>0,05$ ) pada kadar MDA hepar tikus DKA dibandingkan kadar MDA hepar tikus D dan kadar GPx-1 hepar tikus DKA juga tidak berbeda dibandingkan kadar GPx-1 hepar tikus D.

**Kata kunci :** diabetes mellitus, kafein, ALA, MDA, GPx-1

## ABSTRACT

**Research background:** Diabetes is one of the metabolic diseases marked by hyperglycemia, triggering oxidative stress. Alpha Lipoic Acid (ALA) can be used to suppress increased oxidative stress and caffeine supplementation can be used to recover pancreatic  $\beta$  cells in diabetic conditions. This research aims to elucidate the effects of caffeine and ALA as supplements on the status of oxidative stress in the liver of diabetic rats, conducted by observing the Malondialdehyde (MDA) and Glutathione Peroxidase-1 (GPx-1) levels as a parameter.

**Research methods:** This was experimental study with post-test only control group design. Thirty male Wistar rats were divided into five groups: Normal (N), Diabetes (D), Diabetes + Caffeine (DC), Diabetes + ALA (DA), and Diabetes + Caffeine + ALA (DCA). The diabetic rats were induced with *Streptozotocin* (STZ) 60 mg/kg body weight. Caffeine (60 mg/kg body weight) and ALA (50 mg/kg body weight) were supplemented every day for six weeks as supplements. The MDA and GPx-1 levels were tested by employing the ELISA technique.

**Research findings:** Liver MDA levels of DKA group were not different ( $p > 0,05$ ) compared to liver MDA levels of N group. There was no significant difference in the liver MDA of DCA group ( $72.56 \pm 17.82$ ) compared to liver MDA of D group ( $95,15 \pm 7,98$ ). The liver GPx-1 of DCA group ( $80.91 \pm 15.37$ ) was also not different from liver GPx-1 of D group ( $66,81 \pm 10,19$ ). **Conclusion:** This study did not show significant difference ( $p > 0,05$ ) in rat liver MDA level of DKA compared to liver MDA level of D rat group and GPx-1 liver level of DKA rat was not different from GPx-1 liver D rat group.

**Keywords:** diabetes mellitus, caffeine, ALA, MDA, GPx-1