

INTISARI

Latar Belakang: Setengah dari kasus infertilitas berhubungan dengan faktor pria. Penyebab utama infertilitas pada pria adalah stres oksidatif, yang mengacu pada ketidakseimbangan antara kadar reaktif oksigen spesies (ROS) dan antioksidan. Salah satu penyebab kasus infertilitas adalah Disfungsi Ereksi (DE). Inhibitor phosphodiesterase-5 (PDE5) dikenal sebagai obat disfungsi ereksi, telah merevolusi diagnosis dan pengelolaan DE.

Tujuan: Mengetahui pengaruh pemberian sildenafil sitrat (PDE5 inhibitor) terhadap stres oksidatif jaringan testis tikus Wistar jantan dewasa dengan mengkaji ekspresi SOD, MDA dan Tubulus Seminiferus.

Metode: Sampel menggunakan tikus *Rattus norvegicus* strain Wistar jantan dewasa sebanyak 24 ekor, dibagi menjadi 4 kelompok: K= kontrol, P1= sildenafil dosis rendah 0,9mg/1ml, P2= sildenafil dosis sedang 1,8mg/1ml dan P3= sildenafil dosis tinggi 3,6mg/1ml. Ekspresi SOD dan MDA diukur menggunakan metode ELISA. Histopatologi testikuler menggunakan preparate histologi yang diberi pewarnaan HE, diamati pada 25 tubulus menggunakan *software image Raster* pada perbesaran 100x. Uji statistik menggunakan uji normalitas *Shapiro-Wilk* dilanjutkan menggunakan uji rerata *one way ANOVA* dan uji signifikansi menggunakan uji *post hoc LSD*.

Hasil: Diperoleh hasil penurunan yang signifikan secara statistik antara kadar SOD P3 (25.81 ± 3.82) dengan kontrol (77.95 ± 4.75), P1 (76.35 ± 3.33), dan P2 (68.82 ± 8.01) dengan nilai $p < 0,01$. Kadar MDA P3 (9.20 ± 0.57) meningkat signifikan secara statistik dibandingkan dengan kontrol (1.72 ± 0.30), P1 (2.03 ± 0.20) dan P2 (3.58 ± 0.46) dengan nilai $p < 0,01$. Diameter lumen tubulus seminiferus pada P1 (61.30 ± 14.35), P2 (53.40 ± 8.02) dan P3 (52.75 ± 11.58) tidak berbeda signifikan secara statistik dibandingkan kontrol (62.51 ± 15.05). Tebal epitel tubulus seminiferus didapatkan perbedaan signifikan secara statistik antara P3 (24.48 ± 8.26) dibandingkan dengan kontrol (37.02 ± 2.62) dan P2 (36.06 ± 1.68) dengan nilai $p < 0,01$.

Kesimpulan: Pemberian sildenafil dosis tinggi (3,6 mg/1 ml) menurunkan ekspresi SOD dan meningkatkan ekspresi MDA dibandingkan dosis rendah (0,9 mg/1 ml), sedang (1,8 mg/1 ml), serta kelompok tanpa perlakuan dan mempengaruhi lebar diameter lumen dan tebal epitel menjadi lebih tipis.

Kata kunci : PDE5 Inhibitor, Sildenafil sitrat, SOD, MDA, tubulus seminiferus testis.

ABSTRACT

Background: Half of infertility cases are related to male factors. The main cause of infertility in men is oxidative stress, which refers to an imbalance between reactive oxygen species (ROS) and antioxidant levels. One of the causes of infertility cases is Erectile Dysfunction (ED). Phosphodiesterase-5 (PDE5) inhibitors known as erectile dysfunction drugs, have revolutionized the diagnosis and management of ED.

Objective: To determine the effect of sildenafil citrate (PDE5 Inhibitor) administration on oxidative stress of testicular tissue of adult male Wistar rats by examining the expression of SOD, MDA and Seminiferous Tubules.

Methods: The sample used 24 adult male *Rattus norvegicus* strain Wistar rats, divided into 4 groups: K = control, P1 = low dose sildenafil 0.9mg/1ml, P2 = medium dose sildenafil 1.8mg/1ml and P3 = high dose sildenafil 3.6mg/1ml. SOD and MDA expression were measured using the ELISA method. Testicular histopathology using HE-stained histology preparation, observed in 25 tubules using Raster image software at 100x magnification. Statistical tests used the Shapiro-Wilk normality test followed by a one-way ANOVA test of means and a significance test using the LSD post hoc test.

Results: There was a statistically significant decrease between SOD levels of P3 (25.81 ± 3.82) with control (77.95 ± 4.75), P1 (76.35 ± 3.33), and P2 (68.82 ± 8.01) with a value of $p < 0.01$. MDA level of P3 (9.20 ± 0.57) was statistically significantly increased compared to control (1.72 ± 0.30), P1 (2.03 ± 0.20) and P2 (3.58 ± 0.46) with p value < 0.01 . The diameter of the seminiferous tubule lumen in P1 (61.30 ± 14.35), P2 (53.40 ± 8.02) and P3 (52.75 ± 11.58) was not statistically significantly different from the control (62.51 ± 15.05). The thickness of seminiferous tubule epithelium was found to be statistically significant difference between P3 (24.48 ± 8.26) compared to control (37.02 ± 2.62) and P2 (36.06 ± 1.68) with p value < 0.01 .

Conclusion: Administration of high dose sildenafil (3.6 mg/1 ml) decreased SOD expression and increased MDA expression compared to low dose (0.9 mg/1 ml), medium dose (1.8 mg/1 ml), and untreated group and affected the width of lumen diameter and epithelial thickness to be thinner.

Keywords: PDE5 Inhibitor, Sildenafil citrate, SOD, MDA, testicular seminiferous tubules.