

**PENGARUH PEMBERIAN *N-ACETYLCYSTEIN* TERHADAP KADAR
SUPEROXIDE DISMUTASE, *MALONDIALDEHYDE* DAN HORMON
TESTOSTERON**

(Studi Eksperimental Pada Tikus Jantan Galur *Sparague Dawley* Yang Diberi Diet Tinggi Kolesterol)

ABSTRAK

Latar Belakang : Hiperkolesterolemia mengakibatkan terjadinya peningkatan produksi ROS (*Reactive Oxygen Species*) yang menimbulkan stress oksidatif dengan peningkatan *Lipid Peroksidase* (LPO) yang menyebabkan infertilitas dengan penurunan kadar testoteron. *Superoxide Dismutase* (SOD) merupakan pertahanan pertama terhadap proses peroksidasi lipid yang berlebihan di dalam sel. Stres oksidatif menjadi pencetus kadar *Malondialdehyde* (MDA) yang meningkat. Kondisi ini dapat dinetralkan dengan mengkonsumsi antioksidan dari luar tubuh seperti *N-Acetylcysteine* (NAC).

Tujuan : mengetahui pengaruh pemberian NAC terhadap kadar SOD, kadar MDA, dan hormon testoteron yang diberi diet tinggi kolesterol.

Metode : Penelitian ekperimental dengan pendekatan *post test only control group design*. Subyek penelitian berjumlah 24 ekor tikus jantan galur *sparague dawley* yang dibagi secara acak menjadi 4 kelompok. Kelompok K1 tanpa pemberian NAC dan diet tinggi kolesterol. Kelompok K2 tanpa pemberian NAC namun diberi diet tinggi kolesterol. Kelompok K3 dan K4 diberi diet tinggi kolesterol dan NAC masing-masing dengan dosis 3,14 mg/ml dan 6,3 mg/ml. Hari ke 25 dilakukan pengambilan darah untuk pemeriksaan kadar SOD, MDA, dan testoteron di IBL FK UNISSULA pada November - Desember 2020.

Hasil : Uji *Kruskal Wallis* menunjukkan perbedaan bermakna pada kadar SOD ($p=0,033$) dan MDA ($p=0,047$), serta uji *One Way Anova* pada kadar testoteron menunjukkan perbedaan bermakna ($p=0,021$). Uji *Mann Whitney* kadar SOD dan MDA pada K1, K3, dan K4 menunjukkan perbedaan signifikan terhadap K2 ($p<0,05$). Hasil uji *Post Hoc Tukey* kadar testoteron pada K1 dan K4 menunjukkan perbedaan signifikan terhadap K2 ($p<0,05$).

Kesimpulan: Pemberian NAC menunjukasecara bermakna dapat meningkatkan kadar SOD, menurunkan kadar MDA, dan meningkatkan hormon testoteron yang diberi diet tinggi kolesterol.

Kata Kunci : *N-Acetylcysteine*, *Superoxide Dismutase*, *Malondialdehyde*, *Testoteron*

THE EFFECT OF GIVING *N-ACETYLCYSTEINE* ON *SUPEROXIDE DISMUTASE*, *MALONDIALDEHYDE* AND *TESTOSTERONE HORMONE*

(Experimental Study on *Sparague Dawley* Male Rats Given a High Cholesterol Diet)

ABSTRACT

Background: Hypercholesterolemia results in an increase in the production of ROS (Reactive Oxygen Species) which causes oxidative stress with an increase in Lipid Peroxidase (LPO) which causes infertility with a decrease in testosterone levels. Superoxide Dismutase (SOD) is the first line of defense against excessive lipid peroxidation in cells. Oxidative stress triggers increased levels of Malondialdehyde (MDA). This condition can be neutralized by consuming antioxidants from outside the body such as N-Acetylcysteine (NAC).

Objective: To determine the effect of NAC on SOD levels, MDA levels, and testosterone levels given a high cholesterol diet.

Methods: Experimental research with a post test only control group design approach. The research subjects were 24 male *Sparague Dawley* rats which were divided randomly into 4 groups. Group K1 without giving NAC and a diet high in cholesterol. Group K2 was not given NAC but was given a high cholesterol diet. The K3 and K4 groups were given high cholesterol and NAC diets, respectively, at doses of 3,14 mg / ml and 6,3 mg / ml. On the 25th day, blood was drawn to check SOD, MDA, and testosterone levels at IBL FK UNISSULA in November - December 2020.

Results: The Kruskal Wallis test showed significant differences in the levels of SOD ($p = 0.033$) and MDA ($p = 0.047$), and the One Way Anova test on testosterone levels showed significant differences ($p = 0.021$). Mann Whitney test for SOD and MDA levels at K1, K3, and K4 showed significant differences against K2 ($p < 0.05$). Tukey's Post Hoc test results, testosterone levels at K1 and K4 showed a significant difference to K2 ($p < 0.05$).

Conclusion: The administration of N-Acetylcysteine increases SOD levels, reduce MDA levels, and increase testosterone in male *sparague dawley* rats fed a high cholesterol diet.

Keyword: *N-Acetylcysteine, Superoxide Dismutase, Malondialdehyde, Testosterone*