PENGARUH KOMBINASI GELEMBUNG NANO NITRIT OKSIDA (NO) DAN GELEMBUNG NANO HIDROGEN TERHADAP KADAR SGOT DAN SGPT TIKUS GALUR SPRAGUE DAWLEY PADA UJI TOKSISITAS AKUT

Sallysha Devana Siti Almira, Nor Sri Inayati, Nur Signa Aini Gumilas

Fakultas Kedokteran Universitas Jenderal Soedirman, Purwokerto, Indonesia

Email: sallysha.almira@mhs.unsoed.ac.id

ABSTRAK

Latar Belakang – Gelembung nano berukuran sangat kecil dan memiliki aksesibilitas dan stabilitas lebih tinggi sehingga efektivitas penghantaran senyawa seperti kombinasi nitrit oksida dan hidrogen untuk terapi akan meningkat. Uji toksisitas merupakan uji menggunakan hewan coba yang perlu dilakukan untuk memastikan keamanan penggunaan suatu sediaan uji dengan menilai potensi efek toksik yang ditimbulkan, termasuk pada organ hepar. Salah satu indikator kerusakan hepar adalah peningkatan enzim transaminase, yaitu SGOT dan SGPT.

Tujuan – Mengetahui pengaruh kombinasi gelembung nano nitrit oksida (NO) dan gelembung nano hidrogen terhadap peningkatan kadar SGOT dan SGPT tikus galur *Sprague Dawley* dalam uji toksisitas akut.

Metode Penelitian – Penelitian ini merupakan penelitian eksperimental dengan *post-test only with control group design*. Penelitian dilakukan pada 24 tikus *Sprague Dawley* betina yang dibagi menjadi 4 kelompok, yaitu kelompok 1 sebagai kelompok kontrol, kelompok 2 dengan perlakuan injeksi GNNO 5 ml/GNH 15 ml, kelompok 3 dengan perlakuan injeksi GNNO 7,5 ml/GNH 12,5 ml, dan kelompok 4 dengan perlakuan injeksi GNNO 10 ml/GNH 10 ml. Kadar SGOT dan SGPT diukur menggunakan spektrofotometer dan hasil kadar SGOT dan SGPT tersebut dianalisis dengan *Kruskal Wallis* dilanjutkan dengan uji *post hoc*.

Hasil – Hasil penelitian menunjukkan kadar SGOT dan SGPT diukur 24 jam setelah perlakuan masuk ke dalam rentang normal. Hasil uji *Kruskal Wallis* pada kadar SGPT menunjukkan tidak ada perbedaan signifikan antara kadar SGOT pada setiap kelompok tikus dengan nilai *p value*=0,074. Hasil uji *Kruskal Wallis* pada kadar SGOT menunjukkan terdapat perbedaan signifikan kadar SGPT antara kelompok dengan *p value*=0,027 dilanjutkan dengan uji *post hoc* dan didapatkan hasil bahwa terdapat perbedaan signifikan antara kelompok 1 dan 4 dengan *p value*=0,027 yang berarti peningkatan kadar SGPT pada kelompok 4 lebih tinggi dibandingkan kelompok 1.

Kesimpulan – Tidak terdapat pengaruh antara kombinasi gelembung nano nitrit oksida dan gelembung nano hidrogen terhadap peningkatan kadar SGOT dan SGPT.

Kata Kunci: gelembung nano hidrogen, gelembung nano nitrit oksida, uji toksisitas, SGOT, SGPT

THE EFFECT OF NITRIC OXIDE NANOBUBBLES AND HYDROGEN NANOBUBBLES COMBINATION ON SGOT AND SGPT LEVELS OF SPRAGUE DAWLEY RATS IN ACUTE TOXICITY TEST

Sallysha Devana Siti Almira, Nor Sri Inayati, Nur Signa Aini Gumilas

Faculty of Medicine, Jenderal Soedirman University, Purwokerto, Indonesia

Email: sallysha.almira@mhs.unsoed.ac.id

ABSTRACT

Background – *Nanobubbles are very small and have higher accessibility and stability so that the effectiveness of delivering compounds such as a combination of nitric oxide and hydrogen for therapy will increase. Toxicity testing is a test using experimental animals that needs to be done to ensure the safety of using a test preparation by assessing the potential toxic effects caused, including on the liver. One indicator of liver damage is an increase in transaminase enzymes, namely SGOT and SGPT.*

Objective – *To determine the effect of a combination of nitric oxide (NO) nano bubbles and hydrogen nanobubbles on SGOT and SGPT levels in Sprague Dawley rats in an acute toxicity test.*

Methodology – *This study is an experimental study with post-test only with control group design. The study was conducted on 24 female Sprague Dawley rats divided into 4 groups, namely group 1 as the control group, group 2 with GNNO 5 ml/GNH 15 ml injection treatment, group 3 with GNNO 7.5 ml/GNH 12.5 ml injection treatment, and group 4 with GNNO 10 ml/GNH 10 ml injection treatment. SGOT and SGPT levels were measured using a spectrophotometer and the results of SGOT and SGPT levels were analyzed using Kruskal Wallis followed by a post hoc test.*

Results – *The results of the study showed that SGOT and SGPT levels were measured 24 hours after treatment and were within the normal range. The results of the Kruskal Wallis test on SGPT levels showed no significant difference between SGOT levels in each group of mice with a p value = 0.074. The results of the Kruskal Wallis test on SGOT levels showed that there was a significant difference in SGPT levels between groups with a p value = 0.027 followed by a post hoc test and the results showed that there was a significant difference between groups 1 and 4 with a p value = 0.027 which means that the increase in SGPT levels in group 4 was higher than group 1.*

Conclusion – *There was no effect between the combination of nitric oxide nano bubbles and hydrogen nano bubbles on increasing SGOT and SGPT levels.*

Keywords: *hydrogen nanobubbles, nitric oxide nanobubbles, toxicity test, SGOT, SGPT*