

Respons Fisiologis Tikus Putih (*Rattus norvegicus* Berkenhout,1769) terhadap Kebisingan Intensitas Tinggi

INTISARI

Organisme yang terpapar kebisingan, dapat mengalami stres dan memicu timbulnya mekanisme respon fisiologis yang kompleks dan perubahan perilaku. Respon tubuh dalam menanggapi stres melibatkan koordinasi sistem saraf dan hormonal, yang keduanya mempengaruhi respons fisiologis meliputi profil eritrosit (jumlah total eritrosit; hemoglobin; hematokrit; *Mean Corpuscular Volume* (MCV); *Mean Corpuscular Haemoglobin* (MCH); dan *Mean Corpuscular Haemoglobin Concentration* (MCHC)); profil leukosit (jumlah total leukosit; neutrofil; limfosit dan rasio neutrofil); trombosit; hormon kortisol dan perilaku. Penelitian ini bertujuan untuk mempelajari respons fisiologis tikus putih (*Rattus norvegicus* Berkenhout, 1769) jantan dan betina galur wistar terhadap kebisingan intensitas tinggi yang dipaparkan pada siang atau malam hari. Sebanyak 12 ekor tikus dibagi kedalam 6 kelompok berdasarkan jenis kelamin dan perlakuan, masing-masing perlakuan didampingi oleh kontrol (*sham*). Perlakuan kebisingan menggunakan alat ultrasonik Rat Repeller dengan frekuensi 45.000 Hz dan intensitas 120 dB. Penelitian diawali dengan pengambilan baseline. Perlakuan pemanjanaan dilakukan selama 7 jam/ hari, perlakuan siang pada pukul 06.00-13.00 WIB dan untuk perlakuan malam pada pukul 22.00-05.00 WIB. Data dianalisis secara statistik dengan *One-Way ANOVA* yang dilanjutkan dengan *Duncan's Multiple Range Test* (DMRT) dengan tingkat kepercayaan 95%. Hasil penelitian menunjukkan bahwa kebisingan pada siang hari mengakibatkan stres yang lebih nyata daripada malam hari. Kebisingan menurunkan nilai profil eritrosit pada tikus betina dan meningkatkan nilai profil leukosit pada tikus jantan serta terjadi perubahan perilaku baik pada tikus jantan maupun betina. Profil trombosit, kadar kortisol dan berat badan pada kedua jenis kelamin tidak menunjukkan perubahan yang nyata. Dapat disimpulkan bahwa kebisingan menurunkan nilai profil eritrosit pada tikus betina dan meningkatkan nilai profil leukosit pada tikus jantan perlakuan 3 hari serta mengalami perubahan perilaku pada kedua jenis kelamin.

Kata kunci: Kebisingan, profil eritrosit, profil leukosit, trombosit, hormon kortisol dan perilaku.

The Physiological Responses of White Rats (*Rattus norvegicus* Berkenhout, 1769) against High-Intensity Sounds

ABSTRACT

*The high-intensity sounds not only make organisms stressed but also trigger their complex physiological responses and behavioural changes. The response of the body involves the nervous and hormonal system coordinations which affect physiological responses such as (1) erythrocyte profiles (the amount of erythrocytes, hemoglobins, hematocrits, mean corpuscular volume or MCV, mean corpuscular hemoglobin or MCH, and mean corpuscular Hemoglobin Concentration or MCHC); (2) leukocyte profiles (the amount of leukocytes, neutrophils, lymphocytes, and the ratio of neutrophils); (3) thrombocytes; (4) cortisol levels; (5) and behaviour. The objective of this study is to study the physiological responses of male and female white rats (*Rattus norvegicus* Berkenhout, 1769) against high-intensity sounds which are exposed at day and at night. Twelve rats are divided into six groups based on gender and treatment. Each treatment is accompanied by the control (sham). High-intensity sounds treatment is provided by using Rat Repeller (an ultrasonic tool) with 45.000 Hz and 120 dB. The study begins by baseline taking. The process of treatment are carried out for 7 hours day. The day treatment is from 6 a.m. to 1 p.m. The night treatment is from 10 p.m. to 5 a.m. The data were statistically analysed by One-Way ANOVA which is continued by using Duncan's Multiple Range Test (DMRT) with a confidence level of 95%. The results of the study showed that the high-intensity sounds which are given to the rats at day make the rats more stressed than the high-intensity sounds which are given to the rats at night. The high-intensity sounds not only reduce the value of erythrocyte profiles in female rats, but also increase the value of leukocyte profiles in male rats and affect behavioral changes both in male and female rats. The thrombocyte profiles, cortisol levels, and weight in both male and female white rats showed no real changes. It can be concluded that the high-intensity sounds reduce the value of erythrocyte profiles in female rats and increase the value of leukocyte profiles in male rats for 3 days treatment and affect behavioural changes in male and female rats.*

Keyword: high-intensity sounds, erythrocyte profiles, leukocyte profiles, thrombocytes, cortisol hormone, and behaviour