

PENGARUH PAPARAN ELEKTROMAGNETIK TELEPON SELULER TERHADAP KADAR HEMOGLOBIN DAN JUMLAH ERITROSIT PADA TIKUS PUTIH (*Rattus norvegicus*) WISTAR

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ABSTRAK

Latar Belakang – Paparan elektromagnetik telepon seluler frekuensi tinggi (800–2200 MHz) dapat berdampak buruk bagi kesehatan, termasuk pada proses eritropoiesis. Penilaian kadar hemoglobin dan jumlah eritrosit merupakan indikator penting untuk skrining anemia.

Tujuan – Mengetahui pengaruh paparan elektromagnetik telepon seluler terhadap kadar hemoglobin dan jumlah eritrosit tikus putih (*Rattus norvegicus*) Wistar.

Metode Penelitian – Penelitian ini menggunakan metode *true experimental design* dengan desain penelitian *post test only with control group*. Jumlah sampel terdiri dari 28 ekor tikus putih (*Rattus norvegicus*) jantan galur Wistar yang dibagi menjadi 4 kelompok. Kelompok 1 sebagai kelompok kontrol yang dimasukkan ke kandang perlakuan selama 45 hari tanpa diberikan paparan elektromagnetik telepon seluler dan kelompok 2, 3, 4 sebagai kelompok perlakuan yang dimasukkan ke kandang perlakuan dan diberikan paparan elektromagnetik telepon seluler 2100 MHz melalui mode panggilan *Whatsapp* selama 2 jam/hari dengan jarak 3 cm selama 15, 30, dan 45 hari. Kadar hemoglobin dan jumlah eritrosit diukur menggunakan metode otomatis *Hematology Analyzer*. Data dianalisis menggunakan uji *ANOVA Welch*.

Hasil – Rerata kadar hemoglobin kelompok 1= 16,07 g/dL, 2= 16,90 g/dL, 3= 16,53 g/dL, dan 4= 16,47 g/dL Rerata jumlah eritrosit kelompok 1= 8,15 juta/ μ L, 2= 8,61 juta/ μ L, 3= 8,56 juta/ μ L, dan 4= 8,89 juta/ μ L. Uji *ANOVA Welch* menunjukkan nilai $p > 0,05$ untuk kadar hemoglobin dan jumlah eritrosit, yang berarti tidak ada perbedaan signifikan antar kelompok.

Kesimpulan – Paparan elektromagnetik telepon seluler selama 15, 30, dan 45 hari tidak memberikan pengaruh signifikan terhadap kadar hemoglobin dan jumlah eritrosit dalam darah tikus putih (*Rattus norvegicus*) Wistar.

Kata kunci: Kadar hemoglobin; jumlah eritrosit; paparan elektromagnetik; telepon seluler; tikus Wistar

**THE EFFECTS OF MOBILE PHONE ELECTROMAGNETIC EXPOSURE
ON HEMOGLOBIN LEVELS AND ERYTHROCYTE COUNT
IN WISTAR RATS (*Rattus norvegicus*)**

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ABSTRACT

Background – Exposure to high-frequency (800–2200 MHz) electromagnetic radiation from mobile phones had a negative impact on health, including the process of erythropoiesis. Hemoglobin levels and erythrocyte counts were important indicators for anemia screening.

Objectives – To determine the effects of mobile phone electromagnetic exposure on hemoglobin levels and erythrocyte counts in Wistar rats (*Rattus norvegicus*).

Methods – This study used a true experimental design with a post-test only with a control group design. A total of 28 male Wistar rats (*Rattus norvegicus*) were divided into 4 groups. Group 1 was the control group, placed in the treatment cage for 45 days without exposure to electromagnetic radiation from mobile phones. Group 2, 3, and 4 were the treatment groups, placed in the treatment cage and exposed to 2100 MHz electromagnetic radiation from mobile phones from Whatsapp for 2 hours/day for 15, 30, and 45 days. Hemoglobin levels and erythrocyte counts were measured using a Hematology Analyzer. Data were analyzed using the ANOVA Welch test.

Results – The mean hemoglobin levels are as follows: group 1 is 16.07 g/dL, group 2 is 16.90 g/dL, group 3 is 16.53 g/dL, and group 4 is 16.47 g/dL. The mean erythrocyte counts are: group 1 is 8.15 million/ μ L, group 2 is 8.61 million/ μ L, group 3 is 8.56 million/ μ L, and group 4 is 8.89 million/ μ L. The ANOVA Welch test shows a p -value > 0.05 for hemoglobin levels and erythrocyte counts, indicating there is no significant differences between the groups.

Conclusion – Electromagnetic exposure from mobile phones for 15, 30, and 45 days does not have a significant effect on hemoglobin levels and erythrocyte counts in the blood of Wistar rats (*Rattus norvegicus*).

Keywords: Electromagnetic exposure; erythrocyte count; hemoglobin levels; mobile phones; Wistar rats