

The Effect of Periapical Radiography X-Ray Radiation on the Number of Leukocytes in Mice (*Mus musculus*)

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Abstract

BACKGROUND: Periapical radiographic X-ray radiation has ionization energy which can cause cell damage in the body such as damage to the hematopoietic stem cell system in the bone marrow which results in inhibition or cessation of the hematopoiesis process, resulting in a decrease in the number of blood cells, especially leukocytes. A decrease in the number of leukocytes can make the body susceptible to infection with bacteria, viruses, fungi, and other agents that can attack tissues in the oral cavity.

AIM: This study aims to determine the effect of periapical radiographic X-ray radiation on the number of leukocytes in mice (*Mus musculus*).

METHODS: This research is a true experimental study with a posttest-only design with a control group design. The sample in this study was 24 mice, male, bodyweight 25–30 g and age 3–4 months which were divided into four groups, namely, the control group and the treatment group, namely, 1, 7, and 10-times exposure to periapical radiography X-ray radiation.

RESULTS: The results showed that there was a decrease in the leukocyte count of mice at 1, 7, and 10 times of exposure, which was obtained by comparing the leukocyte count of the control group and the treatment group. The number of leukocytes in the control group was $8.16 \times 10^3/\mu\text{L}$, the number of leukocytes in the treatment group with 1, 7, and 10 exposures in a row was $7.61 \times 10^3/\mu\text{L}$, $6.03 \times 10^3/\mu\text{L}$, and $5.20 \times 10^3/\mu\text{L}$. The results of statistical tests using One-Way Analysis of variance and *post hoc* Bonferroni showed a significant decrease in the number of leukocytes ($p < 0.05$), namely, in the control group with seven exposures, the control group with ten exposures, and the 1-time exposure group with the 10-time exposure group.

CONCLUSION: There is a decrease in the number of leukocytes in mice due to periapical radiographic X-ray radiation.