

Abstract

Skin is the largest organ of the integumentary system and has various functions. Open wounds are one of the most common skin injuries and there is an essential need for a cure with lowest side effects and most efficacy. Researchers are looking for drugs and therapies to solve the wound healing problem. Titanium oxide nanoparticles have antibacterial and anticancer properties. This nanoparticle reduces infection in the wound. It also has antibacterial effects against gram-positive and gram-negative bacteria. In this study, we tried to investigate the hepatotoxic effects of titanium oxide nanoparticles and Compare the healing effects of these nanoparticles with the tetracycline topical ointment. In this study we selected 30 rat and then made a scaled wound in their backs. Rats divided in three groups and each group respectively cured with vaseline, tetracycline and titanium oxide nanoparticles. We took photo from wounds in 0, 3, 7 and 14 day. Then we calculated area of wounds and evaluated wound area changes. Rats euthanized 3, 7 and 14 days after inducing injury and histopathology samples were collected from wounds. Data from macroscopic and microscopic evaluations were analysed respectively with one-way ANOVA followed by the tukey test and kruskal wallis test. Results of this study shows that wound closure percentage of titanium oxide nanoparticles group is higher than other two groups. The percentage of wound healing on days 3 and 7 in titanium oxide nanoparticles is higher than other groups. And on the 14th day, the wounds are healed altogether. This difference statistically significant. There was no significant difference in histopathological findings. However, in most cases, titanium oxide nanoparticles scored better than the other two groups. It seems that titanium oxide nanoparticles have more effect on wound healing than other groups. It is suggested that antibacterial effects of titanium oxide nanoparticles on contaminated wounds and its effects on burn wounds .

Key words: Titanium oxide nanoparticles, Histopathology, Wound healing, Rat



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