

Abstract

Skin is one of the largest tissues in the body that is constantly expanding and reconstruction throughout life and has many functions. Efforts to find effective methods and treatments for healing wounds have always been one of the issues that have been considered. Topical application of zinc reduces contamination and infection in the wound and increases re-epithelialization as the most important mechanism for wound healing. The ZnO nanoparticle possesses anti-bacterial properties against gram-positive bacteria and gram-negative bacteria. In this study, we tried to compare the healing effects of zinc oxide nanoparticles with zinc oxide ointment. For this purpose, 30 rats were selected and randomly divided into three treatment groups. The three groups were treated with vaseline, zinc oxide ointment and zinc oxide nanoparticles, respectively. The injuries were recorded on days 0, 14, 7, and the wound healing rate was calculated. On day 3, 7 and 14, the mice were euthanized those were subjected to sampling wounds. Histopathologic studies were performed on samples collected from the wound. Finally, the data were analyzed by ANOVA, Kruskal Wallis and Mann-Whitney tests. The results of this study indicate that on the 14th day, there is a significant difference between the treatment groups. On the 14th day, the percentage of wound healing in the zinc oxide nanoparticle group was greater than that of vaseline, although this difference was not statistically significant. The results from histological studies showed that Rete ridge was seen in the ZnO ointment group on the seventh and fourteenth day and vaseline on the 14th day but did not show any significant difference. Acanthosis was observed in the treatment group with zinc oxide ointment on day seven. Zn and ZnO nanoparticles scored better in terms of the number and direction of collagen strands on the 14th day than the ZnO commercial group. In general, zinc oxide nanoparticles appear to have more healing effects than zinc oxide ointment. In addition, antibacterial properties of ZnO nanoparticles can be studied by examining the contaminated wounds.

Key words: Nanoparticles ZnO, Wound, Wound healing, rat



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