Un-denatured whey protein expedites wound healing in diabetic mice model by enhancing the expression of β-defensin 2, 3 and vascular endothelial growth factor (VEGF) in the wounded tissue

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Abstract:

Impaired wound healing is considered as one of the most serious diabetes-associated complications. Defensins, the anti-microbial peptides, have potent bactericidal activity against a wide spectrum of bacterial and fungal organisms commonly responsible for wound infections. We recently demonstrated that Whey proteins (WPs) enhance immune response during diabetes and have a protective role in some diabetic complications. In the present study, we further investigated the effect of a camel WP on the wound healing process in a streptozotocin (STZ)-induced type I diabetic mouse model. Three groups of mice were used (10 mice in each group): group 1, control non-diabetic mice; group 2, diabetic mice; and group 3, diabetic mice orally supplemented with undenatured WP (100 mg/kg body weight/day for one month through oral gavage). We found that diabetic mice exhibited delayed wound closure characterized by significant reduction in the expression of β-defensin 2, 3 and VEGF; prolonged elevation in free radical levels and obvious reduction in the level of glutathione in the wounded tissue as compared to control mice. Interestingly, supplementation of diabetic mice with WP significantly accelerated the closure and healing of the diabetic wounds. WP significantly restored the expression of β-defensin 2, 3 and VEGF; decreased the level of free radical and enhanced glutathione level in the wounded tissue as compared to diabetic mice. Our data revealed the benefits of WP supplementation in improving the healing and closure of diabetic wounds.

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