

Nanofiber Eye Pad: A Promising Alternative as Skin Carrier

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Abstract

Introduction: The delicate area around the eye is the first place to show signs of aging due to the fact that the skin around the eye is thinner than the skin on the face. Also, facial movements and emotional expression affect this area as well. There are many carriers to apply to the skin. Among them, the pad is a carrier that uses a certain amount of nutrients. Conventional pads are fabrics that are prewetted with nutrients. The problem with them is that the solution phase increases the rate of degradation of unstable elements. Nanofiber pad has high surface-to-volume ratio and its size is within the range of skin pore size, which increases the contact surface between pad and face and improves the nutrients absorption. In this research, we are trying to develop a polymeric nanofiber eye pad which has nutrients within its structure.

Methods and Results: The nanofiber eye pad was prepared from gelatin solution containing Q10 powder, Aloe Vera, and ascorbic acid by electrospinning machine at 20 kv on the spunlace media.

The results of SEM images show continuous nanofibers without any beads with an average diameter of 80-300 nm. Microbial analysis was performed on the polymeric solution. The colony size of aerobic bacteria (*P.aeruginosa*, *E.coli* and *S.aureus*) were measured in one-gram solution. The results showed no colonization of these bacteria. A Patch test was performed by inserting a pad on the skin of the volunteer's arm and recording the results after specific time. The results showed that this pad did not create any redness and swelling on the skin and did not cause any irritation.

Conclusions: The nanofiber eye pad containing nutrients does not provide any irritation for the skin, and is a good candidate for replacing an ordinary pad.

Key words: Nanofiber, Eye pad, Skin, Irritation.

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