



Pediatric Pearls

Vitamin E for treating children's scars

Does it help reduce scarring?

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ABSTRACT

QUESTION A few of my patients have been told to use vitamin E cream after surgery or repair of a laceration. What is the evidence for this suggestion, and is this treatment suitable for all patients?

ANSWER Vitamin E is the main lipid-soluble antioxidant in the skin. Several anecdotal reports have suggested that topical use of vitamin E cream can reduce scar formation. Current evidence from the literature, however, does not support that proposition. In fact, studies report some adverse effects with use of vitamin E. Further research is needed before application of vitamin E cream becomes the standard of care.

RÉSUMÉ

QUESTION Certains de mes patients se sont fait conseiller d'utiliser de la crème à la vitamine E après une chirurgie ou la réparation d'une lacération. Quelles sont les données scientifiques à l'appui de cette suggestion et ce traitement convient-il à tous les patients?

RÉPONSE La vitamine E est le principal antioxydant liposoluble dans la peau. Quelques rapports isolés ont laissé entendre que l'usage topique de crème à la vitamine E peut réduire la formation de cicatrices. Par contre, les données scientifiques dans les ouvrages récents ne confirment pas cette affirmation. De fait, des études font état de certains effets indésirables causés par l'usage de la vitamine E. D'autres recherches sont nécessaires avant que l'application de crème à la vitamine E devienne la norme de soin.

Researchers estimate that close to 100 million patients in the developing world acquire scars each year.¹ The scars arise mostly from surgical procedures and trauma. A large proportion of these patients, approximately 4 million of them, acquire scars due to burns. About 70% of burn victims are children.¹ The aftereffects of scars, especially in children and adolescents, are profound and are mostly attributed to changes in the appearance of their bodies and disfiguration.² Consequences of the aftereffects of scars in adults include depression (13% to 23%); posttraumatic stress syndrome (13% to 45%)²; and anxiety, diminished self-esteem,³ and overall decreased quality of life. Thus, there is much interest in the causes of scar formation and in ways to reduce or remove scars that have already formed.

Scarring is the outcome of the natural healing processes of the body in response to tissue injury, in particular trauma. A cut due to an accident or surgery initiates a physiologic cascade of events that lead to tissue resolution and reconstruction. The first step in this cascade of events is inflammation: the immune system invades the site of injury to remove foreign material and harmful agents and destroy invading organisms. Some of the products released by this process might account for

scar formation.⁴ Some confirmation of this theory comes from the discovery that fewer neutrophils are recruited to the site of injury in fetuses whose wounds heal without scars than are recruited to the site of injury in adults who acquire scars.⁴ As the immune system develops and inflammatory reactions amplify, scars appear more frequently, indicating the importance of inflammation in scar formation.⁴

Vitamin E

Vitamin E was discovered in 1922 by researchers at the University of California who suggested it had beneficial properties for skin, especially in support of wound healing and scar repair.⁵ It is the main lipid-soluble antioxidant in the skin.⁶ Vitamin E can be applied topically and will have good penetration into deep dermal tissue. Its antioxidative property helps stabilize cell membranes, including cells of the inflammatory process, and thus reduces the amounts of chemicals released by those cells.⁵ Vitamin E is also believed to have a protective effect against buildup of arterial plaque and against cancer.⁷


Since the discovery that vitamin E is the main lipid-soluble antioxidant in the skin, researchers have

suggested that it might have a role in the treatment of skin lesions and scar formation.^{6,8} Musalmah et al⁹ found an accelerated rate of wound closure in normal and diabetic rats treated with alpha-tocopherol, a subfamily of vitamin E, possibly due to its antioxidant role. Based on current evidence, however, it is hard to recommend vitamin E and hope for promising results.

When vitamin E was added to silicon gel sheets used to treat 80 patients 18 to 63 years old with hypertrophic scars, the combined action of these 2 chemicals brought success.¹⁰ In this blinded study, patients were randomized to 2 groups, 1 receiving vitamin E added to silicon gel sheets and the other receiving only silicon gel sheets. After 2 months, 95% of the study group patients' scars had improved by 50%; only 75% of the control group patients' scars had improved by 50% ($P < .05$).¹⁰ In contrast, another study reported that a randomized group of 159 patients who underwent surgery for postburn contractures was treated for 4 months with topical vitamin E,¹¹ which seemed to have no appreciable effect. Patients were monitored for a year, and observations of scar thickness, change in graft size, range of motion, and ultimate cosmetic appearance were recorded. No beneficial effect of vitamin E could be demonstrated. In a double-blind randomized controlled trial, a topically applied combination of an emollient and vitamin E did not result in a better cosmetic effect in postsurgical 2-layer skin closure than when only the emollient was used.⁶ Moreover, almost a third of the patients reported local reactions to the vitamin E cream. These reactions were mostly contact dermatitis and supported earlier findings of contact urticaria, eczematous dermatitis, and reactions similar to erythema multiforme.^{11,12} The authors suggested that, in some cases, topical vitamin E even worsened the cosmetic appearance of scars and concluded that use of topical vitamin E for treating surgical wounds should be discouraged. A follow-up comment on the study

pointed out that *d*-alpha-tocopherol is an extremely unstable compound and that breakdown products and contaminants could account for the inflammatory response observed.¹³

Conclusion

Although there are anecdotal reports suggesting that topical application of vitamin E could help remove scars and aid in the healing process, current evidence does not fully support that suggestion. In fact, adverse effects should be considered. There is a clear need for better controlled trials to identify more accurately the role of vitamin E in wound healing and scar formation, especially in children. 

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