

How vitamin K gels treat postoperative bruising

Dr I Karavani evaluates a vitamin K gel and vitamin K oxide gel for reducing postoperative bruising topically

A major drawback for patients undergoing invasive medical or surgical techniques for aesthetic improvement is the downtime needed before they can resume their social and professional activities. In this post-treatment phase, the bruising, redness and swelling are key concerns.

Vitamin K cream is known to reduce bruising. The goal of this study was to evaluate the effects of vitamin K cream versus vitamin K oxide cream in post-operative bruising. For this purpose the blepharoplasty of the upper eyelid, an intervention known

for its major bruising, was chosen.

For some 10 years, more and more authors have published the results of their works concerning the interest of using vitamin K topically to prevent and treat various pathologies other than the standard indications that have been known for a long time, such as hypoprothrombinaemia and vitamin K deficiencies. It is known that the metabolite pathway of vitamin K conducts to vitamin K oxide as the active metabolite (*JAMCS*, 1991, 113, 7734-7743). Several studies—not all published—have shown that cosmetic creams

containing vitamin K oxide are more active topically than cosmetic vitamin K cream.

Vitamin K oxide has many physio-chemical advantages over vitamin K: a faster action for dermal indications, stability to light and heat, allergenicity, and others. These advantages are due to the stabilisation by an oxygen atom of the very instable double bond in the naphthoquinone ring of the vitamin K molecule.

In this trial we tested Auriderm K2 Gel (vitamin K in nanosomes formula) versus Auriderm XO (vitamin K oxide in nanosomes formula). Both creams have the same carrying composition except the active vitamins.

Applying vitamin K to limit downtime



Before (left) and after (right) results after four days of application of Auriderm gel. The patients' left eyes were treated with K2 gel, the patients' right eyes were treated with XO. The results show that bruises responded more quickly to XO

Efficacy

We have chosen the nanosomes vectors because of their best efficacy that was shown in previous studies (Delune, March 2001, *J Med Esth & Derm* XXVIII 109, and Batello, Belgium 2003). The nanosomes containing phospholipids increase skin penetration and act as powerful vectors for these lipophilic substances.

Vitamin K or 2 methyl, 3 phytol 1-4 naphthoquinone, is a yellow vitamin, liposoluble, relatively viscous and odourless. Only the trans form is active. It is needed for the synthesis of prothrombin (factor II) and the coagulation factors VII, IX and X. This substance is very sensitive to light.

Vitamin K oxide or 2 methyl -3- phytol -1-4 naphthoquinone 2, 3 oxide is a colourless, viscous and odourless liposoluble liquid. This substance is not sensitive to light.

Indications include purpura caused by pulsed dye lasers; all other forms of purpura (actinic, medicinal, spontaneous, traumatic); pre- and post-sclerotherapy; before and after all injections of wrinkle-filling products; erythema caused by laser CO2 resurfacing; red blotches; telangiectasias; aesthetic and plastic surgery bruising and leg spider veins.

Recent literature makes it possible to understand better how vitamin K intervenes in the physio-pharmacology of the skin. The role of the galenic appears vital.

If the formulation contains vitamin K in its free form—that is, not encapsulated in nanosomes—vitamin K, being liposoluble,

will tend to dissolve in oil during the oily phase of the water emulsion. Conversely, if the vitamin K is encapsulated in nanosomes, its migration through the epidermis will be highly facilitated and it will, without problem, reach the papillary and reticular dermis, where its target is located. Vitamin K is highly sensitive to light and must be kept in a tube. This is not the case with the vitamin K oxide.

The most recent data provided on the use of topical vitamin K seem to confirm its value for the indications mentioned. The importance of the type of vehicle and the one of the galenic are primordial to ensure the stability of the preparation.

Materials and methods

Ten patients with redundant upper eyelid skin and fat pockets were selected for the trial. The operation was performed under local anaesthesia (5cc of lidocaine 1% and adrenaline 1:80.000) combined with oral use of Atarax 25mg, Valtran 10 drops and an IM injection of 2.5cc Dormicum.

Resection of the skin was done by radio-surgery (Ellman Inc); resection of a rim of the orbicularis muscle and the fat pockets was done with scissors and a CO2 laser. Coagulation before closure was performed with the Ellman bipolar mode.

After the intervention the patient was advised to rest with cold compresses with Terramycin cream. From the second day on, an anti-bruising gel was used. In this single blind evaluation, the patients received two identical-looking containers with gel of identical consistency. The gel for the left side (marked by an L) contained the Auriderm K2 gel, while the right side (marked by an R) contained the Auriderm XO. Both were applied twice daily for four days.

At the sixth day the stitches were removed and the bruising was evaluated by photography. Scoring was 0–5 (none, slight, moderate, major, exceptional, as seen in blood-clotting disorders or persistent bleeding). Oedemas were also evaluated with 0–5 scores.

The location on the face is an exposed region and known for extreme bruising. The operation is quite invasive compared with regular treatments in an aesthetic clinic. These factors make this a good test for evaluating the gels. Despite the aggressive intervention on a delicate zone, there was moderate to minimal

bruising and swelling on both sides. None of the subjects reached stages 4–5 of the scale. The major difference was seen in the bruising, where the left side treated with the K2 gel showed more bruising (total score 26) than the right side (total score 12), which was treated with the XO gel.

The swelling on the left side (K2, total score 12) was slightly more than on the right side (XO, total score 11), but with a difference that is too low to be conclusive. Even in operations known for major bruising, the downtime can be limited thanks to vitamin K preparations. The XO metabo-

lite shows a faster resolution and is more effective than K2. Further, it seems to have an anti-oedematous effect. □

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The blepharoplasty from top left, clockwise: resection of skin; resection of fat; resection of muscle; and the closure

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PATIENT	BRUISING		SWELLING	
	R-XO	L-K2	R-XO	L-K2
#1	1	2	1	2
#2	1	2	1	1
#3	1	3	1	1
#4	1	2	0	0
#5	2	3	3	2
#6	2	3	1	1
#7	1	3	1	1
#8	1	3	1	1
#9	1	2	1	1
#10	1	3	1	2
Total	12	26	11	12