



Quick READ

In recent years, manufacturers of laser and light-based technologies have developed equipment that physicians can adjust to safely and effectively treat darker-skinned patients, an expert says. He predicts such developments will continue.

Laser treatment of ethnic skin: Seeing the light

Requires adjustment for differences in physiology

By JOHN JESMUS

SENIOR STAFF CORRESPONDENT

Las Vegas — Safe, effective laser treatments for ethnic patients require lower energy settings, longer pulses and longer wavelengths than one would typically use for Caucasian patients, as well as greater attention to cooling techniques, an expert says.

"At one point a few years ago, laser manufacturers virtually ignored dark-skinned people and believed these technologies could not be used to treat them," Khalil Khatri, M.D., says.

However, Dr. Khatri, who is medical director of Skin and Laser Surgery Center of New England,

with offices in Chelmsford, Mass., and Nashua, N.H., says the current generation of laser technology is built in a way that allows physicians to change settings so that they can treat darker-skinned patients.

"Not only (in) the United States, but also worldwide there's a huge population whose skin is much darker than Caucasian skin," Dr. Khatri tells *Dermatology Times*.

And manufacturers' increasing attention to darker-skinned patients has boosted the popularity of laser and light treatments worldwide, he adds.

Idiosyncrasies of darker skin

Compared to lighter skin, the epidermis of darker-skinned patients possesses increased melanin (but the same number of melanocytes) and larger, more melanized melanosomes, which degrade more slowly than those of fair-skinned patients, Dr. Khatri says.

Because of these factors, he says, "Darker skin absorbs and scatters more UV light, which gives dark-skinned patients better photoprotection. This results in less photodamage, skin cancers and wrinkles" than Caucasian patients typically experience.

However, Dr. Khatri adds, "The dermis itself is also thicker in darker skin, and the mesenchymal activity within the dermis is higher, which leads to greater risk of developing hypertrophic and keloidal scars."

Accordingly, he says that if one treats dark-skinned patients with the same settings as one would use for Caucasian patients, the increased amount of melanin within the epidermis of the darker-skinned patients means their skin would absorb more energy and suffer more complications — namely, hyperpigmentation, hypopigmentation or depigmentation — as a result.

Cool it

To avoid these problems, common cooling techniques include use of gel packs, ice packs and cryogenic sprays, all of which physicians typically



Dr. Khalil

A patient with skin type V before (left) and after Er:YAG laser ablation of dermatosis papulosa nigra.

Photos: Khalil Khatri, M.D.



Salex™ (6% Salicylic Acid) Cream Salex™ (6% Salicylic Acid) Lotion

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DESCRIPTION

Salex™ Cream contains 6% salicylic acid USP incorporated into a patented Multivesicular Emulsion (MVE) vehicle consisting of ammonium lactate, behentrimonium methosulfate and cetyl alcohol, cetyl alcohol, dimethicone 360, disodium EDTA, glycerin, glyceryl stearate SE, methylparaben, mineral oil, PEG-100 stearate, phenoxyethanol, propylparaben, purified water and triolamine.

Salex™ Lotion contains 6% w/v salicylic acid USP incorporated into a patented Multivesicular Emulsion (MVE) vehicle consisting of ammonium lactate, behentrimonium methosulfate and cetyl alcohol, cetyl alcohol, dimethicone 360, disodium EDTA, glycerin, glyceryl stearate SE, methylparaben, mineral oil, PEG-100 stearate, propylparaben, purified water and triolamine.

Salicylic acid is the 2-hydroxy derivative of benzoic acid having the following structure:



This MVE formulation has been shown to provide gradual and prolonged release of the active ingredient into the skin.

CLINICAL PHARMACOLOGY

Salicylic acid has been shown to produce desquamation of the horny layer of skin while not effecting qualitative or quantitative changes in the structure of the viable epidermis. The mechanism of action has been attributed to a dissolution of intercellular cement substance. In a study of the percutaneous absorption of salicylic acid in a 6% salicylic acid gel in four patients with extensive active psoriasis, Taylor and Halperin showed that the peak serum salicylate levels never exceeded 5 mg/100 ml even though more than 60% of the applied salicylic acid was absorbed. Systemic toxic reactions are usually associated with much higher serum levels (30 to 40 mg/100 ml). Peak serum levels occurred within five hours of the topical application under occlusion. The sites were occluded for 10 hours over the entire body surface below the neck. Since salicylates are distributed in the extracellular space, patients with a contracted extracellular space due to dehydration or diuretics have higher salicylate levels than those with a normal extracellular space. (See PRECAUTIONS.)

The major metabolites identified in the urine after topical administration are salicylic acid (52%), salicylate glucuronides (42%) and free salicylic acid (6%). The urinary metabolites after percutaneous absorption differ from those after oral salicylate administration; those derived from percutaneous absorption contain more salicylate glucuronides and less salicylic acid and salicylic acid. Almost 99% of a single dose of salicylate is excreted within 24 hours of its entrance into the extracellular space.

Fifty to eighty percent of salicylate is protein bound to albumin. Salicylates compete with the binding of several drugs and can modify the action of these drugs; by similar competitive mechanisms other drugs can influence the serum levels of salicylate. (See PRECAUTIONS.)

INDICATIONS AND USAGE

For Dermatologic Use: Salex™ is a topical aid in the removal of excessive keratin in hyperkeratotic skin disorders, including verrucae, and the various ichthyoses (vulgaris, sex-linked and lamellar), keratosis palmare and plantaris, keratosis pilaris, pityriasis rubra pilaris, and psoriasis (including body, scalp, palms and soles).

For Podiatric Use: Salex™ is a topical aid in the removal of excessive keratin on dorsal and plantar hyperkeratotic lesions. Topical preparations of 6% salicylic acid have been reported to be useful adjunctive therapy for verrucae plantaris.

CONTRAINDICATIONS

Salex™ should not be used in any patient known to be sensitive to salicylic acid or any other listed ingredients. Salex™ should not be used in children under 2 years of age.

WARNINGS

Prolonged and repeated daily use over large areas, especially in children and those patients with significant renal or hepatic impairment, could result in salicylism. Patients should be advised not to apply occlusive dressings, clothing or other occlusive topical products such as petrolatum-based ointments to prevent excessive systemic exposure to salicylic acid. Excessive application of the product other than is needed to cover the affected area will not result in a more rapid therapeutic benefit. Concomitant use of other drugs which may contribute to elevated serum salicylate levels should be avoided where the potential for toxicity is present. In children under 12 years of age and those patients with renal or hepatic impairment, the area to be treated should be limited and the patient monitored closely for signs of salicylate toxicity: nausea, vomiting, dizziness, loss of hearing, tinnitus, lethargy, hyperpnea, diarrhea, and psychic disturbances. In the event of salicylic acid toxicity, the use of Salex™ should be discontinued. Fluids should be administered to promote urinary excretion. Treatment with sodium bicarbonate (oral or intravenous) should be instituted as appropriate. Patients should be cautioned against the use of oral aspirin and other salicylate containing medications, such as sports injury creams, to avoid additional excessive exposure to salicylic acid. Where needed, aspirin should be replaced by an alternative non-steroidal anti-inflammatory agent that is not salicylate based.

Due to potential risk of developing Reye's syndrome, salicylate products should not be used in children and teenagers with varicella or influenza, unless directed by a physician.

PRECAUTIONS

For external use only. Avoid contact with eyes and other mucous membranes.

DRUG INTERACTIONS

The following interactions are from a published review and include reports concerning both oral and topical salicylate administration. The relationship of these interactions to the use of Salex™ is not known.

I. Due to the competition of salicylate with other drugs for binding to serum albumin the following drug interactions may occur:

DRUG	DESCRIPTION OF INTERACTION
Sulfonylureas	Hypoglycemia potentiated.
Methotrexate	Decreases tubular reabsorption; clinical toxicity from methotrexate can result.
Oral Anticoagulants	Increased bleeding.

II. Drugs changing salicylate levels by altering renal tubular reabsorption:

DRUG	DESCRIPTION OF INTERACTION
Corticosteroids	Decreases plasma salicylate level; tapering doses of steroids may promote salicylism.

DRUG	DESCRIPTION OF INTERACTION
Acidifying Agents	Increases plasma salicylate level.
Alkalinizing Agents	Decreases plasma salicylate levels.

III. Drugs with complicated interactions with salicylates:

DRUG	DESCRIPTION OF INTERACTION
Heparin	Salicylate decreases platelet adhesiveness and interferes with hemostasis in heparin treated patients.
Pyrazinamide	Inhibits pyrazinamide induced hyperuricemia.
Uricosuric Agents	Effect of probenecid, sulfinpyrazone and phenylbutazone inhibited.

The following alterations of laboratory tests have been reported during salicylate therapy:

LABORATORY TESTS	EFFECT OF SALICYLATES
Thyroid Function	Decreased PBI; increased T3 uptake.
Urinary Sugar	False negative with glucose oxidase; false positive with Clinistix with high-dose salicylate therapy (2-5g q.d.).
5-Hydroxyindole acetic acid	False negative with fluorometric test.
Acetone, ketone bodies	False positive FeCl ₃ in Gerhardt reaction; red color persists with boiling.
17-OH corticosteroids	False reduced values with >4.8g q.d. salicylate.
Vanilmandelic acid	False reduced values.
Uric acid	May increase or decrease depending on dose.
Prothrombin	Decreased levels; slightly increased prothrombin time.

Pregnancy (Category C): Salicylic acid has been shown to be teratogenic in rats and monkeys. It is difficult to extrapolate from oral doses of acetylsalicylic acid used in these studies to topical administration as the oral dose to monkeys may represent six times the maximal daily human dose of salicylic acid when applied topically over a large body surface. There are no adequate and well-controlled studies in pregnant women. Salex™ should be used during pregnancy only if the potential benefit justifies the potential risk to the fetus.

Nursing Mothers: Because of the potential for serious adverse reactions in nursing infants from the mother's use of Salex™, a decision should be made whether to discontinue nursing or to discontinue the drug, taking into account the importance of the drug to the mother. If used by nursing mothers, it should not be used on the chest area to avoid the accidental contamination of the child.

Carcinogenesis, Mutagenesis, Impairment of Fertility: No data are available concerning potential carcinogenic or reproductive effects of Salex™. Salicylic acid has been shown to lack mutagenic potential in the Ames Salmonella test.

ADVERSE REACTIONS

Excessive erythema and scaling conceivably could result from use on open skin lesions.

OVERDOSAGE

See Warnings.

DOSE AND ADMINISTRATION

The preferable method of use is to apply Salex™ thoroughly to the affected area and to cover the treated area at night after washing and before retiring. Preferably, the skin should be hydrated for at least five minutes prior to application. The medication is washed off in the morning and if excessive drying and/or irritation is observed a bland cream or lotion may be applied. Once clearing is apparent, the occasional use of Salex™ will usually maintain the remission. In those areas where occlusion is difficult or impossible, application may be made more frequently; hydration by wet packs or baths prior to application apparently enhances the effect. (See WARNINGS.) Unless hands are being treated, hands should be rinsed thoroughly after application. Excessive repeated application of Salex™ will not necessarily increase its therapeutic benefit, but could result in increased local intolerance and systemic adverse effects such as salicylism.

HOW SUPPLIED

Salex™ Cream is available in 400g (NDC 13548-010-13) bottles.

Salex™ Lotion is available in 14 fl oz (414 ml) (NDC 13548-011-14) bottles.

Store at controlled room temperature 20° - 25°C (68° - 77°F). Do not freeze.

(1) Data on file.



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employ before and, if desired, after treatment, Dr. Khatri notes.

"Contact cooling is probably the best way, because it allows one to cool the area being treated before treatment, during treatment and right after treatment," he says.

Contact cooling mechanisms include water-based systems and sapphire crystals.

With such mechanisms, Dr. Khatri says, "One can parallel cool as well — while one is delivering the pulse — because the pulse is going through the sapphire crystal, which is already making the epidermis cold."

One also can lower energy levels to make treatments safer for darker-skinned patients, although this practice decreases efficacy, he says.

In contrast, he says, "Cooling helps in two ways — it reduces the risk of complications and allows us to use higher energy settings, which can provide better efficacy."

Furthermore, Dr. Khatri says that with most laser devices, "We use a longer pulse when treating darker-skinned patients."

He likens this practice to pouring a pail of water slowly — which allows heat energy to dissipate during treatment — as opposed to dumping it all at once.

Regarding wavelengths, he says that for applications such as hair removal, 1,064 nm Nd:YAG lasers and intense pulsed light (IPL) devices (near the higher end of their 500 nm to 1,200 nm range) probably are safest for dark-skinned patients.

"With the 1,064 nm laser," Dr. Khatri explains, "the absorption of melanin is very low. That's one of the reasons it's better for darker skin."

As for pulse durations, he says that for hair removal in dark-skinned patients, "One would probably want to use a setting of 40 ms or higher," compared to 10 ms to 20 ms or perhaps lower in Caucasian patients.

Moves to meet the need

By the same token, he says one can use bleaching creams to lower dark skin's melanin content before treatment.

But if one does this, Dr. Khatri recommends making sure that patients use sunblock before and after laser or light treatments.

Along with hair removal, he says that state-of-the-art laser and pulsed-light technologies also can be used for photorejuvenation, skin resurfacing, vascular treatments and tattoo removal in darker skin. **DT**

Disclosure: Dr. Khatri reports no financial interests relevant to this article.

For more information: www.skinlaseronline.com



A patient with skin type IV before and after hair removal with an IPL device.

Photos: Khalil Khatri, M.D.

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Please see next page for brief summary of Important Safety Information.

*As reported in a national survey of 273 patients with moderate to severe scalp psoriasis.

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RINSE AND RELIEF