

Ocular complications of common cosmetics

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Unfortunately, substances aimed at enhancing beauty can cause ocular and periocular damage.

The use of cosmetics is well established in our society. However, such products can produce adverse ocular effects, which range from mild discomfort to vision threatening conditions. This article describes some complications that can result from the use of common cosmetics.

Mascara

Mascara can accumulate on the ocular surface, where it causes simple pigmentation. This most commonly involves the tarsal conjunctiva, usually at the lower edge of the upper eyelid, but uncommonly involves the bulbar surface (Figure 1).¹ The pigmentation does not require treatment. Use of mascara can also lead to contact dermatitis of the eyelid.

Commercial preparations of mascara that do not contain preservatives have been shown to support eye pathogens (e.g. *Pseudomonas aeruginosa*).² Applicators can cause corneal abrasions, which may become infected if the mascara is

contaminated.²⁻⁴ Infectious conjunctivitis has been linked to the sharing of make-up items, including mascara, eyeliner and eye shadow.⁵ Patients who have abrasions and infectious keratitis or conjunctivitis require ophthalmic referral.

Allergic responses include an asymptomatic follicular response of the tarsal conjunctiva. Symptoms attributable to allergy should be an indication to cease use of mascara or to change to a low allergy type of mascara.

Dyes for tinting eyelashes and eyebrows

Traditionally, compounds such as toluenediamine and paraphenylenediamine, which provide a dark pigment, have been used in eyelash and eyebrow dyes. Hypersensitivity reactions may result, which can lead to keratoconjunctivitis, blepharitis and contact dermatitis (Figure 2).^{6,7} Topical corticosteroids should be used to treat hypersensitivity reactions, and use of the dye should be ceased. Paraphenylenediamine applied to head hair has caused dermatitis associated with eyelid oedema, chemosis, and exophthalmos due to orbital oedema, as well as corneal epithelial loss and infiltrates. These conditions are reversible.

In 2006, three cases of ocular argyrosis were reported that involved diffuse deposits in the conjunctiva, Descemet membrane and deep stroma of the cornea resulting from long term self-application

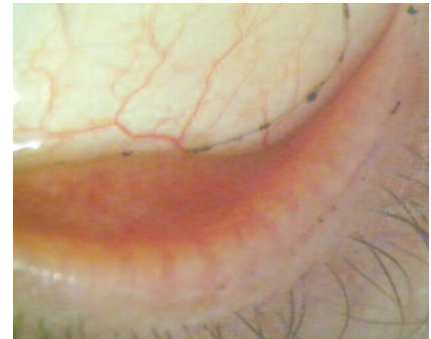


Figure 1. Sequestered mascara deposits in the inferior fornix that could lead to conjunctival deposits.



Figure 2. Allergic reaction to eyelash dye.

of Revlon Roux Lash and Brow Tint.⁸ This dye is meant for professional use only. Patients should be aware that no natural or synthetic colour additives are approved by the US FDA for permanent dyeing or tinting eyelashes and eyebrows, for use in either beauty salons or the home.

Haircare products

Hair spray that is accidentally sprayed into the eyes can lead to ocular discomfort, blurred vision, sensitivity to glare and irritation. The sprays are generally composed of a resin dissolved in alcohol and contain acrylates.^{9,10} The keratopathic effect is due to components of the spray as well as the force of the aerosol.¹⁰ The keratopathy is often mild and transient, with symptoms resolving within a few days after discontinuing use of the offending spray.

Product testing and the removal of irritating components have substantially reduced the unpleasant sensation of shampoo entering the eyes. There have

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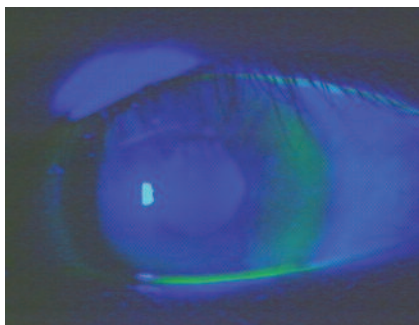


Figure 3. Corneal abrasions caused by a face scrub.

been rare reports of ocular damage resulting from use of other hair products. An example is episodic corneal epithelial oedema resulting from triethanolamine and quaternium-15 in a hair groom gel, which dissolved and ran down into the eyes with perspiration.¹¹ Shampoo for treating lice infestations has caused severe ocular irritation and corneal abrasions.¹² Accidental thermal injury to the corneal epithelium has resulted from use of electric curling irons.

Treatment for surface keratopathy relating to the use of haircare products should include ocular lubricants and possibly mild topical corticosteroids.

Perfumes

Direct contact to the eye with perfume can cause burning, tearing, redness and swelling, as well as a chemical keratitis (similar to hair spray keratitis) that resolves over a short period of time.¹³ It can also lead to blepharitis. Treatment for keratopathy related to perfume contact should consist of ocular lubricants. Mild topical corticosteroids could be considered if a prolonged keratitis results.

Fragrance allergy affects about 1% of the population, and can lead to facial dermatitis that can involve the eyelids. Unfortunately, fragrances are ubiquitous, being found in the majority of cosmetics, and therefore difficult to avoid.

In a US laser surgery centre, vapours

Eye health and the use of cosmetics: advice for patients*

- Stop using any cosmetic that causes irritation. If irritation persists, see a doctor.
- Do not use eye cosmetics if you have an eye infection or inflammation around the eye.
- Wash your hands before applying eye make-up, and be sure any instrument you place in the eye area is clean.
- Do not share your cosmetics or allow them to be exposed to dust or soil.
- Do not use old containers of eye cosmetics. Discard mascara three months after purchase.
- Never moisten eye make-up with saliva or water.
- Do not store cosmetics at temperatures above about 29°C, as this may cause the preservative to deteriorate.
- Be careful not to scratch your eye. Never apply or remove eye make-up in a moving vehicle.
- Do not use any cosmetics near your eyes unless they are intended for that use.
- Avoid colour additives that are not approved for use in the area of the eye.

* Adapted and summarised from: Office of Cosmetics and Colors Fact Sheet 'Eye cosmetic safety'. FDA Center for Food Safety and Applied Nutrition (available at: www.cfsan.fda.gov/~dms/coseye2.html).

from perfumes have been shown to cause a deterioration in laser beam power over time, prompting investigators to suggest that patients and staff not wear perfumes in the laser suite.¹⁴

Skin and nail products

Skin cleansers and moisturisers, eye creams, wrinkle creams and topical corticosteroids can cause ocular discomfort, burning and stinging, even when applied some distance from the eyes. It is most likely caused by spread of chemical over the skin to the eyes if applied within proximity of the eye, which has been referred to as 'eye area sensitivity syndrome'.¹⁵ Keratitis resulting from use of an abrasive cosmetic skin polish has been reported in a patient who had complained of a chronic foreign body sensation in her eyes for two years; microscopic examination of scrape specimens from the cornea and conjunctiva showed glass-like foreign body particles.¹⁶ Simple corneal abrasions can also result from the use of face scrubs due to particles potentially embedding under the upper eyelid (Figure 3).

More severe reactions are very uncommon. For example, a case of severe

blepharoconjunctivitis after using a 'skin peel' containing trichloroacetic acid has been reported; the symptoms resolved in three to four days but treatment with dexamethasone and ocular lubricants was necessary.¹⁷ Benophenone (which is present in nail enhancement products) has been reported to cause eyelid dermatitis.¹⁸

If symptoms suspected to be due to these products do not resolve with use of regular ocular lubricants, administered four times a day, then ophthalmic referral is required.

Cyanoacrylate

Many reports of self-inflicted cyanoacrylate (Superglue) eye injuries exist.¹⁹ Care to avoid accidental ocular application in the home is necessary. Bottles containing nail adhesives are remarkably similar to many bottles containing ocular lubricants, and in order to avoid mix ups the different types of product should not be stored together.²⁰

Management includes use of warm compresses. It may be necessary to cut the eyelashes to remove the cyanoacrylate. Patients with corneal injury require ophthalmic referral.

continued

Canthaxanthin

Canthaxanthin, an oral tanning agent, is associated with deposits of golden yellow crystals in the macula, macular pucker, and a low static luminance threshold. These effects seem to be reversible.^{21,22} The substance may also be a cause of retinopathy when ingested in the diet (canthaxanthin is used in salmon farming).²³

Final comments

Substances intended to enhance beauty may produce ocular and periocular damage. Products applied to the eye area itself, as well as to the hair, skin and nails, may cause toxic or allergic reactions. Such reactions range from simple irritation to severe corneal keratitis and eyelid dermatitis. In addition, infection can result from the use of contaminated items.

Many of the deleterious effects on the ocular surface that are associated with cosmetics are related to the misuse of products and/or to a lack of education. Some safety information for patients is provided in the box on page 57; further details are given on the FDA fact sheet 'Eye cosmetic safety', (see www.cfsan.fda.gov/~dms/coseye2.html). MT

A list of references is available on request to the editorial office.

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