

Simerdip Kaur takes a look at the latest ophthalmology-related news stories and asks which are based on facts and which are 'fake news'.

Headline: If looks could kill – kohl and the eye

Human fascination with beautification can be traced back centuries. From the ancient Egyptian practices of enhancing the appearance of eyes using eye liner and eye shadow made of toxic heavy metals, to the use of the perennial herbaceous nightshade plant to dilate pupils for a seductive appearance whilst being potentially lethal, history proves that we are willing to suffer for beauty. Today, non-invasive industrial strength cosmetic products for the eyes such as Latisse® are all the rage. In this article, we will explore the controversy surrounding the use of kohl for the eye.

Kohl – derived from the Arabic language, is a black or dark grey powder used as a traditional eye cosmetic applied to the palpebral conjunctiva using fingers or an applicator [1]. It is also commonly known as 'surma' or 'kajal' in the South Asian community [2]. Its use is prevalent in the Middle East, Asia and Africa in women, men and children. Traditional preparations of kohl involve grinding galena (lead sulphite) that is often mixed with other ground metals such as zinc oxide, herbal extracts including neem, fennel, menthol as well as ground gemstones and pearls [1]. This formulation was believed to help prevent conditions such as trichiasis, blepharitis, trachoma, chalazion, conjunctivitis whilst also providing protection from the glare of the sun and dust in the desert landscape by the ancient Egyptians [1]. Today, however, the kohl that is widely available as an over-the-counter cosmetic almost bears no resemblance to ancient kohl and is often carbon based and lead-free. Nonetheless, a recent review exposed alarming statistics of the lead content in some of these products unbeknown to the consumer [3]. But surely as it is meant for topical application it cannot be systemically absorbed thus be of no concern?

In the late 60s and 70s, several cases of lead poisoning were reported in children in the UK of South Asian origin [4,5]. Further investigation revealed the only source of significant lead exposure in these cases were from kohl application on the eye, as well as on the umbilical stump in newborn babies to promote shrinking as a cultural practice [4]. Several animal studies were conducted to investigate the association between kohl and serum lead concentration, but they were inconclusive and of poor quality in design, plus human studies were deemed unethical despite one uncontrolled study in volunteers [4]. Whilst lead sulphite is insoluble in aqueous solution, the widely accepted theory on its mechanism of entry into the blood stream is through inadvertent oral ingestion from poor hand hygiene [4]. Also, prolonged contact and exposure of kohl on the skin can cause lead absorption transdermally from studies on lead dressings in wounds, and fine particles can also be inhaled [4]. Despite the mounting evidence from these epidemiological studies, Mahmood et al. [1] suggest that overall kohl application and lead toxicity poses a theoretical rather than practical health hazard.

Nonetheless, the risks are too serious to ignore. In the United States (US), kohl is a banned substance and not approved by the Federal Drug Authority (FDA) with import restrictions [3]. Similarly, in the UK and Europe, cosmetic products containing toxic elements such as lead, cadmium, antimony, selenium are prohibited from being sold. However, such products are available to purchase from a variety of sources on the Internet including Amazon UK and eBay, as well as shops in parts of the UK, Spain, Belgium and Geneva [3]. Whilst these products are not made in the UK or Europe, somehow they slip through the net and are brought into these countries, in addition to benefiting from reduced regulation in the domain of online shopping. What's worrying is that a significant proportion of these products did not have a full list of ingredients printed on the packaging or made fraudulent claims of being 'lead-free' when table x-ray fluorescence (XRF) spectrometry and scanning electron microscopy-energy-dispersive x-ray spectroscopy (SEM-EDXS) revealed lead concentrations ranging from a few mg/kg⁻¹ to over 400 000 mg/kg⁻¹ in a significant proportion of these products [3].

Today, the practice of applying kohl, especially in children, may be less prevalent in South Asian communities in the UK due to the accumulation of scientific advice that has driven the campaign for greater awareness about its potential dangers [5]. As ophthalmologists, we often see patients wearing eye makeup that is usually of no consequence to their ocular health except for potentially worsening underlying blepharitis. It is worth enquiring about the use and source of these cosmetic products, as well as lid hygiene practices in these patients, even more so if the patient is pregnant and a must if it is a child.

Personally, I recall the surma-laden fingertip of my grandmother approaching my eyeball, swiftly followed by a grainy sensation between my eye lids. A few blinks later and quick look in the mirror revealed a 'smokey eye' look which provoked amused curiosity from my pre-school classmates. Fortunately, those days were short-lived.

References

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Eye News would like to thank Simerdip for her excellent work on this section over the last few years and wish her all the best for the future.

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