

In this new series, **Simerdip Kaur** takes a look at the latest ophthalmology-related news stories and asks which are scientific reality and which are ‘fake news’.

**Headline:**  
Patient changes  
eye colour  
permanently and has  
brighter and whiter  
looking eyes

If you thought this was impossible or absurd, think again. Whitening cosmetic treatments have typically been used to improve the appearance of teeth or to lighten skin tones. Whitening of the eyes is a new procedure, largely aimed at patients with conjunctival discolouration from hyperaemia or pigmentation, related to UV light exposure, allergies, chronic alcohol intake, smoking, drug abuse, ocular rosacea, tiredness and underlying medical conditions.

Essentially, it is regional conjunctivectomy with Mitomycin C (MMC) whereby the bulbar conjunctiva and a portion of Tenons capsule are resected. This is followed by application of topical MMC to the underlying sclera. The procedure aims to produce conjunctival regeneration without excess vascularisation or pigmentation. Postoperatively, in some cases subconjunctival bevacizumab is also administered to reduce the chances of blood vessel proliferation [1]. Patients are given topical eye drops to instill which typically include a combination of antibiotic, non-steroidal anti-inflammatory drugs (NSAIDs), steroids, 0.02% MMC drops as well as testosterone ointment to the eyelids reported in one case study [2].

Dr Bong-Hyun Kim started cosmetic eye whitening in South Korea in 1996 [1,3], and more recently there is the I-BRITE patented eye whitening system by Dr Boxer Wachler in California, costing between US\$3,000 and US\$5,500 per eye [4]. At present, there does not seem to be any such treatment available in the UK.

Let's consider the basics for a moment. The conjunctiva is partly a stratified squamous non-keratinising epithelium where it lies close to the lid as well as stratified columnar epithelium in the bulbar regions. It has a protective function over the surface of the eye, notably containing mucin producing goblet cells responsible for the mucus layer of the tear film, intraepithelial MHC Class II-positive dendritic cells and intraepithelial lymphocytes. There are further lymphocytes in the connective tissue beneath the epithelium

which can aggregate to form the local mucosal or conjunctival lymphoid tissue (MALT or CALT) [5]. It is therefore probably unwise to remove this seemingly unimportant later and instill MMC to the sclera beneath it to inhibit fibroblast proliferation [6].

Whilst there are many reported success stories following this procedure, there are also cases of serious complications such as raised intraocular pressure (IOP), limbal cell compromise, scleral thinning, necrotising scleritis, infectious and non-infectious scleritis and persistent conjunctival epithelial defects [2,7]. These complications can occur up to several years after the procedure when patients have been discharged from their post-op follow-up [7].

Now, what about changing the colour of the iris? A previously healthy female student travelled to Panama in 2009 to have light brown iris implants but settled for blue instead as they were out of stock. Shortly after the procedure she lost her sight and required further surgery back in the UK to remove the implants before her eyesight returned to baseline approximately three months later [8].

There are, however, less invasive ways of doing so. There is a company known as iCOLOUR claiming that their eye drops are able to not only lighten the colour of your eyes but also to change the colour altogether. Their FAQs section states that “inhibition of the activation of the enzyme required to produce melanin results in a decrease in melanin, thus changing your eye colour semi-permanently lasting several years, with no effect on vision and no reported side-effects thus far” [9].

The drops are composed of sterile water, thickener and stabilisers such as glycerin and carboxy-methylcellulose, potassium bicarbonate as a buffering agent, an antiseptic in the form of boric acid, purified benzyl alcohol as preservative, and n-acetyl-glucosamine which prevents glycation of tyrosinase to activated tyrosine. The latter ingredient is the active component responsible for decreasing melanin production in the iris stromal melanocytes. It has been shown that n-acetyl-glucosamine can reduce the appearance of facial hyperpigmentation when applied topically [10]. As this product is not for medicinal purposes, FDA approval in the USA is not necessary. Furthermore, this drug is marketed and solely distributed online, thus making it easily accessible and costs around US\$38.95 per 9ml bottle [9].

As ophthalmologists, it is our responsibility to know the basic principles underlying the various new surgical and pharmaceutical interventions for progressively common cosmetic eye procedures in order to advise our patients appropriately [10]. We should address reversible causes of conjunctival hyperaemia

and discolouration such as allergen exposure, lifestyle modifications, as well as optimal management of chronic systemic diseases in partnership with the patient's physician. These patients also need to be fully informed of the risks of eye whitening treatments. The existence of iris-colour-changing-drops should also prompt the ophthalmologist to at least question the use of such a drug in the past when confronted with patients who appear to have different colour irides from previous consultations.

#### References:

1. Caceres V. An eye-opening look at eye brightening procedures. *Eyeworld* 2013;**18**(10):60-1.
2. Saldanha MJ, Yang PT, Chan CC. Scleral thinning after I-BRITE procedure treated with amniotic membrane graft. *Can J Ophthalmol* 2016;**51**:e115-6.
3. Kim BH. Regional conjunctivectomy with postoperative mitomycin C to treat chronichyperemic conjunctiva. *Cornea* 2012;**31**(3):236-44.
4. Boxer Wachler B. I-BRITE® Conjunctivoplasty for Improved Confidence. Boxer Wachler Vision Institute and MedNet Technologies, Inc., 2014.
5. Forrester JV, Dick AD, McMenamin PG, et al. *The eye: Basic Sciences in Practice*. 4th edition. Elsevier; 2015.
6. Leung TG, Dunn JP, Akpek EL, Thorne JE. Necrotizing scleritis as a complication of cosmetic eye whitening procedure. *J Ophthalmic Inflamm Infect* 2013;**3**(1):39.
7. Moshirfar M, McCaughey MV, Fenzl CR, et al. Delayed manifestation of bilateral scleral thinning after I-Brite procedure and review of literature for cosmetic eye-whitening procedures. *Clin Ophthalmol* 2015;**9**:445-51.
8. *Daily Mail Online*. 'I had surgery in Panama to change my eye colour - but ended up blind': £8,000 unregulated op went horribly wrong for student (and had to be corrected on NHS).
9. iCOLOUR. <https://icolour.info>
10. Kimball AB, Kaczvinsky JR, Li J, et al. Reduction in the appearance of facial hyperpigmentation after use of moisturizers with a combination of topical niacinamide and N-acetyl glucosamine: results of a randomized, double-blind, vehicle-controlled trial. *Br J Dermatol* 2010;**162**(2):435-41.

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