How safe are topical corticosteroids?

Topical corticosteroids (TCSs) are the first-line therapy to treat inflammation in atopic eczema and have been widely used for more than 50 years. In spite of this – and numerous research studies confirming their safety and effectiveness when used appropriately and under supervision – many people are worried about the potential side effects of TCSs and are reluctant to use them, especially parents with their children.

We asked leading eczema expert **Professor Carsten Flohr,** Consultant Dermatologist at St John's Institute of Dermatology, Guy's and St Thomas' Hospital in London, to explain the facts and fears about TCSs.

But first a little background...

Steroids are naturally occurring hormones produced in the body. They are also made synthetically and can be delivered as a medicine in a variety of ways (e.g. orally by tablet, by injection, via an inhaler, as a nasal spray or droplets, or in the form of a cream or ointment). The type of steroid used to treat eczema is known as a 'corticosteroid'. 'Topical' means 'applied to the skin'.

TCSs have immunosuppressive, anti-proliferative[1] and vasoconstrictive[2] effects on the skin. Their main benefit, however, is to reduce inflammation, making the skin less red, itchy and sore. In order to be successful, TCSs need to be used in conjunction with a programme of other treatments, including emollients to moisturise and protect the skin, and soap substitutes to cleanse it.

TCS preparations for eczema are available as creams, ointments and gels, and come in four different strengths or potencies: mild, moderately potent, potent and very potent. They are prescribed according to the severity of the person's eczema, their age, the part of the body that is affected and any other treatments used. The potency of TCSs is determined by the amount of vasoconstriction it produces.

Potency also relates to the degree to which the TCS reduces inflammation and its potential for causing side effects.

It is important to use the correct amount of TCS for your eczema. To bring a flare under control, a TCS is normally applied once or twice a day for short bursts of treatment (typically 7–14 days). Some people who have more severe eczema are sometimes advised by their dermatologist to apply TCS on 2 days a week to the areas where their eczema normally flares as a flare-prevention strategy, also known as 'weekend therapy'.

There is no doubt that TCSs *can* cause side effects, but researchers and clinicians stress that these usually only occur when potent or very potent TCSs are used over a long period of time, especially on delicate areas such as the face and genitals, or areas of the body where a TCS has been applied under occlusion (covering TCS under gloves or bandages/wraps, for example, increases its strength). The main potential side effects are thinning of the skin and a reduction in its elasticity. Other rare side effects are redness (erythema) and pustules around the mouth (perioral dermatitis) when TCS treatment is stopped.

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Here Professor Carsten Flohr answers our questions about topical corticosteroids.

Q Why are people so worried about topical corticosteroids?

The widespread anxiety about using corticosteroids is sometimes referred to as 'corticophobia'. This phenomenon was first recognised around 30 years ago in the context of asthma, but these days people seem far more worried about using TCSs, even though the inhalers, nasal drops and sprays for asthma involve a greater uptake of corticosteroid into the body's cells. The term 'phobia' (an irrational fear) is perhaps incorrect, given that TCSs do carry some risks if used inappropriately. However, the degree of confusion and anxiety surrounding TCSs can be baffling to dermatologists in light of the scientific research.

One example of the confusion and lack of knowledge about TCSs comes from a small questionnaire-based study[3] which asked eczema patients or their parents about their knowledge of the potencies of TCSs. Notably, only 62.5% of the 48 patients who had used both Dermovate (clobetasol propionate 0.05%, very potent) and 1% hydrocortisone (mild) were able to correctly grade Dermovate as being more potent than 1% hydrocortisone. Overall, 72.5% of respondents worried about using TCSs on their own or their child's skin.

In order to evaluate TCS 'phobia' among atopic eczema patients, with the ultimate aim of redressing poor understanding, a questionnaire called the TOPICOP©[4,5] scale has been developed and tested worldwide. Interestingly, many of the participants said that they did not know the side effects of TCSs but were still afraid of using them, highlighting the fact that negative beliefs and attitudes concerning TCSs are not always evidence based.

As in the first study above, the main concern we hear from patients in clinic about TCSs is the perceived risk of skin thinning. Unfortunately, due to lack of dermatology training, many primary care doctors are as confused as their patients about the correct use of TCSs and therefore err on the side of extreme caution when prescribing. This often leads to the underuse of TCSs and resulting poor management of eczema.

Patients who are frustrated at not getting satisfactory results from their GP often turn to the internet for advice. Of course, there is good, evidence-based information available (e.g. from the British Association of Dermatologists **www.bad.org.uk** and the National Eczema Society **www.eczema.org**), but there is also a lot of misinformation and scaremongering out there – for example, we frequently come across sensationalist newspaper and social media reports about TCS addiction and withdrawal, as well as the so-called 'red skin syndrome'. In reality, these conditions are extremely rare and in my experience only occur with prolonged use of potent or very potent TCS.

Q What are the risks of damaging my skin with topical corticosteroids and what are the signs of this happening?

The risks of TCSs depend on the state of the skin barrier, the extent and area of the body affected, the age of the person, the amount and potency of TCS applied, occlusion and duration of treatment.

TCSs will not thin the skin so long as the appropriate strength is used in the correct place and usage is for a limited period of time. For example, potent and very potent TCSs are generally not used on delicate areas where the skin is already thin, such as the face or genital area, as this could lead to skin thinning.

Early signs of skin thinning are an increase in skin transparency and the appearance of superficial spidery blood vessels (telangiectasia). Skin thinning can be permanent, but if caught early it can recover, at least to a degree. Incidentally, there is no way to objectively measure skin thinning in a routine clinical setting, although some research studies have used ultrasound to measure skin thickness.

The skin might also develop stretch marks (striae). Stretch marks, of course, are common in pregnancy and at other times of rapid growth (e.g. teenage growth spurts). It is unusual to see them on the face; they are more likely to appear in the groin and the flexures of the arms and legs as well as the back.

People sometimes wonder whether dark or light patches appearing on their eczematous skin are caused by TCS. They are usually not. This is a sign of the melanocytes[6] either going into overdrive and producing more pigment (hyperpigmentation) or stopping/reducing pigment production (hypopigmentation) as a result of earlier inflammation in the surrounding area. Post-inflammatory hyperpigmentation (dark patches) generally occurs in people of Black African, Black Caribbean or Asian descent; post-inflammatory hypopigmentation (light patches) is more commonly seen in those with mixed Black African or Black Caribbean/Caucasian parentage. It can take 6–12 months for normal skin colour to return. Skin thickening can also cause the skin to become darker.

Q Can topical corticosteroids cause contact dermatitis?

Yes, it is possible to develop a contact allergic dermatitis to the ingredients in topical steroids – either to the steroid itself or to a chemical in the base of the cream. This is uncommon but important to test for through patch testing where suspected.

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Q Are topical corticosteroids safe to use on delicate areas of skin?

Yes, so long as they are only mild or moderately potent – for instance 1% hydrocortisone is safe to use on the face.

Skin thinning is more likely to occur on the face, especially around the eyes, and other places where the skin is already thin (e.g. the flexures of the arms and legs, and the genital area).

If a potent or very potent topical steroid is used around the eyes for a long time, there is also a risk of glaucoma developing.

Q What about using topical corticosteroids on babies and children?

Generally, the advice is to use 1% hydrocortisone on the face and a moderate-strength TCS such as Eumovate (clobetasone butyrate 0.05%) on the body for babies and small children. Occasionally, potent TCSs have to be used for short periods of time. This is usually initiated and supervised by a dermatologist and is safe practice under their care.

Q How can I tell how strong my topical corticosteroid is?

Your doctor should be able to advise you. It is important to know that the percentage on the tube does not necessarily correspond to the strength of the topical steroid. For instance, Eumovate (clobetasone butyrate 0.05%) is a moderate-strength topical steroid, whereas Dermovate (clobetasol proprionate 0.05%) is very potent.

Q Will topical corticosteroids weaken my immune system?

There is no evidence that TCSs weaken the immune system (i.e. lead to a general susceptibility to infections).

Q Should I be worried about withdrawal symptoms if I stop using topical corticosteroids?

Steroid dependency/addiction is a distinct adverse effect of TCSs[7] but it is *extremely* rare – even dermatologists will see only the very occasional patient with steroid addiction and withdrawal symptoms. Typically, this occurs where potent or very potent TCSs have been used in the wrong place (e.g. the face or the genitalia) on a daily basis for many months. Withdrawal signs include a burning and stinging sensation as well as redness (erythema), sometimes referred to as 'red skin syndrome'. Some people experience a pustular rash around the mouth known as 'perioral dermatitis'.

To avoid dependency, all anti-inflammatory treatments for eczema, including calcineurin inhibitors (see below), are best used in bursts, rather than continuously. To achieve such burst treatments, it is often better to use a more potent TCS or calcineurin inhibitor rather than a weaker one, which often only partially switches off the itch–scratch cycle. People sometimes think that their TCS is no longer working and that they have TCS addiction, because their eczema returns as soon as they stop using it. However, the real reason is usually that they have not been using an adequate amount or potency to treat the flare. Unfortunately, it is also in the nature of eczema to rebound after stopping TCS treatment!

In the unlikely event of TCS addiction, the person has to be 'weaned off' the TCS under the supervision of a dermatologist, stepping down to a lower and lower potency.

Q What treatments can I try instead of topical corticosteroids?

The main alternative treatment to TCSs are topical calcineurin inhibitors (TCIs) – either Elidel (pimecrolimus 1%) cream, or Protopic (tacrolimus 0.03% and 0.1%) ointment. While pimecrolimus 1% has a mild-to-moderate anti-inflammatory effect, tacrolimus 0.1% ointment is potent. It is important to be aware that both preparations can sting, especially when people start using them (this side effect usually wears off after a few days). There are also licensing restrictions for the use of TCIs. The weaker preparations are licensed from two years of age, whereas the stronger tacrolimus is only licensed from 16 years of age. According to NICE guidelines and Department of Health guidance, TCIs should be used when TCSs are either contraindicated or have failed to work. In practice, dermatologists may prescribe any of these TCIs outside of these age ranges. They are particularly suitable when higher-potency treatment is required in a body area with delicate skin (e.g. around the eyes).

Final thoughts...

The clinical effectiveness and safety of topical steroids in atopic eczema is well established, yet there is considerable widespread anxiety about their use. People's main concern is skin thinning, but anxiety is also fuelled by sensational media and online reports about TCS dependency and withdrawal. Although TCSs do carry some risks, public fear is disproportionate to the scientific evidence of harm. Any potential side effects can be avoided by using the appropriate potency and correct amount of TCS as burst treatment, taking into account the severity of the eczema, the age of the person, the part of the body being treated, and any area which is occluded.

Glossary and references

1. 'Anti-proliferative': Preventing or retarding the spread of cells

2. 'Vasoconstrictive': Narrowing the opening of blood vessels

3. Charman, C.R., Morris, A.D. & Williams, H.C. (2000) 'Topical corticosteroid phobia in patients with atopic eczema', *British Journal of Dermatology* 142(5):931–6.

4. Moret, L. *et al.* (2013) 'TOPICOP©: A new scale evaluating topical corticosteroid phobia among atopic dermatitis outpatients and their parents'. Available at https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0076493

5. Stalder, J-F. *et al.* (2017) 'Topical corticosteroid phobia in atopic dermatitis: International feasibility study of the TOPICOP score.' Available at https://onlinelibrary.wiley.com/doi/abs/10.1111/all.13189

6. 'Melanocytes': Cells that produce the pigment melanin

7. Hajar, T. *et al.* (2015) 'A systematic review of topical corticosteroid withdrawal ("steroid addiction") in patients with atopic dermatitis and other dermatoses', *Journal of the American Academy of Dermatologists* 72(3):541–549.

> More information about TCSs and how to use them can be found in the NES factsheet 'Topical Steroids', available at **www.eczema.org/factsheets**