Post-inflammatory Hyperpigmentation of Skin

Appearance

Post-inflammatory hyperpigmentation occurs as brown macules or patches, often with a poorly defined border, irregular in outline and usually with little surface change[1]. The basic mechanism in response to various triggers (see 'Aetiology', below) is melanosis of the epidermal or dermal layer of the skin. A number of inflammatory mediators, including prostanoids, cytokines and chemokines as well as reactive oxygen species, are released during the inflammatory process in the epidermal layer. These stimulate melanocytes to increase the production of melanin. In dermal melanosis, inflammation disrupts the basal layer, causing melanin to be released and trapped in the macrophages of the papillary dermis - a process with the delightful name of pigmentary incontinence[2].

Pigmentary changes are much more common in darker-skinned individuals of Asian or African origin and pigmentation follows many common inflammatory diseases such as eczema, psoriasis or acne. Where erythema is seen in white individuals, pigmentation occurs in dark-skinned individuals[3].

Differential diagnosis

Pigmentation due to increased melanin is a dirty brown colour, as opposed to that due to haemosiderin pigmentation following purpura, which is more a rusty brown colour[4].

Hyperpigmentation on the face may be due to pregnancy or taking the contraceptive pill (melasma (chloasma))[5].

Other conditions which may enter into the differential diagnosis include[6]:

- Acanthosis nigricans.
- Addison's disease.
- Amyloidosis - lichen or macular.
- Tinea versicolor.

Aetiology

- **Inflammatory skin conditions.** Any inflammatory skin condition involving the dermo-epidermal junction can cause hyperpigmentation - eg, eczema, psoriasis, lichen planus, acne, systemic lupus erythematosus, chronic dermatitis and cutaneous T-cell lymphoma.
- **Trauma.**
- **Allergic reactions.**
- **Phototoxicity.**
- **Iatrogenic cause.** Hyperpigmentation can be a complication of treatment with a fully ablative laser device in dark-skinned patients. (This risk can be reduced by the use of fractional CO₂ laser[7].)
- **Drugs.** Chlorpromazine, chloroquine and arsenic are all common culprits. Other drugs which occasionally cause hyperpigmentation include tetracycline, bleomycin, doxorubicin, 5-fluorouracil, busulfan, antimalarial drugs and hormones (eg, oestrogen).
- **Exposure to ultraviolet light.**
- **Exposure to chemicals such as silver, gold and arsenic.**
- **Idiopathic cause.** Occasionally no cause can be identified.

Investigations

- As with melasma, Wood's light may help to differentiate dermal from epidermal hyperpigmentation, which may help to elucidate the cause[8].
- Biopsy may be required, especially if there is no identifiable preceding inflammation to account for the pigmentation[9].

Primary care management

- The condition may resolve in time without additional treatment.
- Avoidance of sun exposure may prevent further hyperpigmentation occurring on the face. Daily use of a high-factor sunscreen may be helpful.
- The underlying cause should be treated if possible.
- Hydroquinone 2% is unlicensed for this indication (and is banned in the UK in commercial skin lightener) but GPs may be requested to continue it once initiated by a consultant, as part of shared care arrangements. The usual considerations concerning the prescription of unlicensed medicines should apply[9].
- A retinoid such as tretinoin may be helpful, particularly in sun-damaged skin[10]. Azelaic acid may also be useful[10].
A topical steroid may help if there is an underlying inflammatory process but, due to skin thinning, caution should be used in applying steroid creams to the face. Retinoic acid triple therapy has been tried using a combination of steroid, retinoid and 4% hydroquinone but requires further evaluation[2]. Other treatments being developed, which have shown some depigmenting activity, include a combination of retinaldehyde (a retinoic acid precursor) and glycolic acid and the peroxidase inhibitor methimazole, which inhibits the production of melanin[3, 9, 11]. Concerns about the safety of hydroquinone (principally carcinogenesis and ochronosis - development of bluish-black discolouration of various tissues) has led to the search for other treatments. Large numbers of topical and oral agents are currently being investigated[2]. Extracts of the tropical fern Polypodium leucotomos administered orally have shown promise in the treatment of a number of pigmentary disorders[13].

**Prognosis**

Patients should be warned that the pigmentation may be slow to resolve, even with treatment. Epidermal pigmentation may persist for 6-12 months[14]. Dermal pigmentation may persist for years[3].

**When to refer**

If the diagnosis is in doubt or the patient requests specialist advice, referral should be considered.

**Further reading & references**

- Pigmentation disorders; DermNet NZ
- Melasma/Chloasma; DermNet NZ
- Pigmentation of skin; Skin Dermatologists

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