DIFFERENTIAL DIAGNOSIS OF MELASMA, ACNE VULGARIS AND THEIR CLINICAL MANIFESTATION

WHAT IS MELASMA?

Melasma is a common skin problem caused by brown to gray-brown patches on the face. Most people get it on their cheeks, chin, nose bridge, forehead, and above the upper lip. It is more common in women than men. Pregnancy is a common cause of melasma. It also affects woman taking oral contraceptives and hormones. (1)

This form of facial pigmentation was previously called '**Chloasma'**, It was also known as the 'mask of pregnancy'.

ETIOLOGY:

- The cause of melasma is complex.
- It has been proposed to be a photoageing disorder in genetically predisposed individuals.
- The pigmentation ultimately results from the overproduction of **melanin by melanocytes** (pigment cells); either taken up by keratinocytes (epidermal melanosis) and/or **deposited in the dermis** (dermal melanosis, melanophages).
- Family history — 60% report affected family members
- Sun exposure — ultraviolet and visible light promote melanin production
- Hormones — **pregnancy** and the use of oestrogen/progesterone-containing **oral contraceptives,** intrauterine devices, implants, and hormone replacement therapy, are implicated in one-quarter of affected women; **thyroid disorders** can be associated with melasma
- Medications and scented products — new targeted therapies for cancer and perfumed soaps, toiletries, and cosmetics may cause a phototoxic reaction to trigger melasma

- Researchers are examining the roles of stem cell, neural, vascular, and local hormonal factors in promoting melanocyte activation.

CLINICAL FEATURES:

- Melasma is more common in women than in men, with an onset typically between the ages of 20 and 40 years.
- Melasma is most common in people who tan easily or have naturally brown skin (Fitzpatrick skin phototypes III, IV).
- It is less common in people with fair skin (Fitzpatrick types I, II) or black skin (Fitzpatrick types V, VI).
- Melasma presents as bilateral, asymptomatic, light-to-dark brown macules or patches with irregular borders.
- Distinct patterns include:
- Centrofacial — forehead, cheeks, nose, upper lip (sparing the philtrum); 50-80% of presentations
- Malar — cheeks, nose
- Mandibular — jawline, chin
- Erythosis pigmentosa faciei — reddened or inflamed
- Extrafacial — forearms, upper arms, shoulders in a sun-exposed distribution.

TYPES OF MELASMA:

Melasma can be separated into epidermal, dermal, and mixed types, depending on the level of increased melanin in the skin.

EPIDERMAL MELASMA

- Border: well-defined
- Colour: dark brown
- **Wood lamp:** appears more obvious
- **Dermoscopy**: Scattered islands of brown reticular network with dark fine granules
- Treatment: usually has a good response.

DERMAL MELASMA

- Border: ill-defined
- Colour: Light brown to blue-grey
- Wood lamp: no accentuation
- Dermoscopy: reticuloglobular pattern, telangiectasia, arciform structures.
- Treatment: usually has a poor response.

MIXED MELASMA

Mixed melasma is the most common type, and is defined by:

- Combination of blue-grey, light and dark brown colours
- Mixed patterns seen with Wood lamp and dermatoscope
- Treatment usually shows a partial improvement.

DIAGNOSIS:

Melasma is usually a clinical diagnosis based on the clinical appearance, and examination with a Wood lamp and dermatoscope.

Occasionally a skin biopsy may be taken. Histology varies with the type of melasma, but typically the following features are seen:

- Melanin deposited in basal and suprabasal keratinocytes
- Highly dendritic (branched) intensely pigmented melanocytes
- Melanin within dermal melanophages.
- Solar elastosis and elastic fibre fragmentation
- An increase in blood vessels.

DIFFERENTIAL DIAGNOSIS:

Other disorders that may resemble melasma clinically include:

- **Post-inflammatory hyperpigmentation:**
  - Postinflammatory pigmentation is temporary pigmentation that follows injury (eg, a thermal burn) or inflammatory disorder of the skin (eg, dermatitis, infection). It is mostly observed in darker

skin types (see ethnic dermatology). Postinflammatory pigmentation is also called acquired melanosis. [2]

- **Solar lentigo and other forms of lentigines and freckles:**
  - Solar lentigo is a harmless patch of darkened skin. It results from exposure to ultraviolet (UV) radiation, which causes local proliferation of melanocytes and accumulation of melanin within the skin cells (keratinocytes). Solar lentigos or lentigines are very common, especially in people over the age of 40 years. Sometimes they are also known as an "old age spot" or "senile freckle". [3]
- **Acquired dermal macular hyperpigmentation:**
  - Acquired dermal macular hyperpigmentation, also called acquired macular pigmentation of unknown aetiology, comprises three conditions:
    - Erythema dyschromicum perstans
    - Lichen planus pigmentosus
    - Idiopathic eruptive macular hyperpigmentation. [4]
- **Drug-induced hyperpigmentation:**
  - Drug-induced skin pigmentation accounts for 10–20% of all cases of acquired hyperpigmentation. Pigmentation may be induced by a wide variety of drugs; the main ones implicated include non-steroidal anti-inflammatory drugs (NSAIDs), phenytoin, antimalarials, amiodarone, antipsychotic drugs, cytotoxic drugs, tetracyclines, and heavy metals. [5]
- **Naevus of Ota and naevus of Hori:**
  - A naevus (American spelling nevus, nevi) is a circumscribed and stable malformation of a component of the skin. Nevi are often present at birth, when they are often called brown birthmarks. Naevi composed of melanocytes (the pigment cells that produce melanin) are called melanocytic naevi or pigmented naevi. [6]

TREATMENT:

GENERAL MEASURES

- Year-round, life-long sun protection — broad-brimmed hat, broad-spectrum very high protection factor (SPF50+) sunscreen containing iron oxides, and sunsmart behaviour
- Discontinue hormonal contraception if possible
- Cosmetic camouflage.

TOPICAL THERAPY

The most successful formulation has been a combination of hydroquinone, tretinoin, and moderate potency topical steroid (skin lightening cream) reported to clear or improve 60–80%.

Other topical agents used alone or, more commonly, in combination have included:

- Azelaic acid
- Kojic acid
- Cysteamine cream
- Ascorbic acid
- Methimazole
- Tranexamic acid
- Glutathione
- Soybean extract.

ORAL TREATMENT

Tranexamic acid blocks conversion of plasminogen to plasmin, with downstream effects inhibiting synthesis of prostaglandin and other factors involved in melasma.

More new oral treatments are being trialled.

PROCEDURAL TECHNIQUES

Chemical peels and lasers can be used with caution, but carry a risk of worsening melasma or causing post-

inflammatory hyperpigmentation. Patients should be pretreated with a tyrosinase-inhibitor, such as hydroquinone.

Superficial epidermal pigment can be peeled off using alpha-hydroxy acids (AHA), such as glycolic acid, or beta-hydroxy acids (BHA), such as salicylic acid.

Microneedling, **intense pulsed light (IPL),** and lasers including **Q-switched Nd:YAG**, ablative and non-ablative **fractionated** and **picosecond lasers** carry a high risk for relapse and the disease becoming more resistant to treatment, so require expert use.

ACNE VULGARIS:

Acne vulgaris is the common form of acne, characterised by a mixed eruption of inflammatory and non-inflammatory skin lesions (see all the acne types).

You may prefer to call acne "pimples", "spots" or "zits".

Nearly all of us have acne at some time or another. Acne affects both sexes and all races. Although acne mainly affects adolescents, it can affect a wide age range.

- Infantile acne
- Acne in children
- Adult acne

CLINICAL FEATURES:

Acne most often affects the face, but it may spread to involve the neck, chest and back, and sometimes even more extensively over the body.

Individual lesions are centred on the pilosebaceous unit, ie the hair follicle and its associated oil gland. Several types of acne spots occur, often at the same time. They may

be inflammatory papules, pustules and nodules; or non-inflamed comedones and pseudocysts.

Superficial lesions

- Open and closed comedones (blackheads and whiteheads)
- Papules (small, tender red bumps)
- Pustules (white or yellow "squeezable" spots)

Deeper lesions

- Nodules (large painful red lumps)
- Pseudocysts (cyst-like fluctuant swellings)

Secondary lesions

- Excoriations (picked or scratched spots)
- Erythematous macules (red marks from recently healed spots, best seen in in fair skin)
- Pigmented macules (dark marks from old spots, mostly affecting those with dark skin)
- Scars of various types

CLINICAL FEATURES IN VARIOUS TYPES OF SKIN:

All characteristic lesions of acne vulgaris can occur in skin of colour, but it usually presents with less discernible redness and more **postinflammatory hyperpigmentation** (pigmented macules) which persists long after the acne lesion has gone. Post-inflammatory hyperpigmentation is often the major reason for seeking medical attention, causing significant psychological effects.

Pomade acne occurs more commonly in people with skin of colour due to cultural practices with hair styling products in African American and Hispanic populations. The use of greasy hair products leads to follicular plugging and comedones along the hairline.

Keloid scarring is more common in skin of colour following acne lesions, particularly along the jawline, chest, and upper back.

ACNE GRADING:

Acne may be classified as mild, moderate or severe. Comedones and inflammatory lesions are usually considered separately.

Mild acne

- <20 comedones
- <15 inflammatory lesions
- Or, total lesion count <30

Moderate acne

- 20–100 comedones
- 15–50 inflammatory lesions
- Or, total lesion count 30–125.

Severe acne

- >5 pseudocysts
- Total comedo count >100
- Total inflammatory count >50
- Or, total lesion count >125

DIFFERENTIAL DIAGNOSIS:

- **ACNE CONGLOBATA**
  - Acne conglobata (AC) is an uncommon and unusually severe form of acne characterized by burrowing and interconnecting abscesses and irregular scars (both keloidal and atrophic), often producing pronounced disfigurement. The comedones often occur in a group of 2 or 3, and cysts contain foul-smelling seropurulent material that returns after drainage.

- **ACNE KELOIDALIS NUCHAE (AKN):**
  - Acne keloidalis nuchae (AKN) is a condition characterized by follicular-based papules and pustules that form hypertrophic or keloidlike scars. AKN typically occurs on the occipital scalp and posterior neck and develops almost exclusively in young, African American men. The term acne keloidalis nuchae is somewhat of a misnomer because the lesions do not occur as a result of acne vulgaris, but rather a folliculitis. Moreover, histologically lesions are not keloidal, nor do the affected patients tend to develop keloidalis in other areas.
- **ACNEIFORM ERUPTIONS**
  - Acneiform eruptions are dermatoses that resemble acne vulgaris. Lesions may be papulopustular, nodular, or cystic. While acne vulgaris typically consists of comedones, acneiform eruptions (such as acneiform drug eruptions) usually lack comedones clinically.
- **DERMATOLOGIC MANIFESTATIONS OF TUBEROUS SCLEROSIS:**
  - Tuberous sclerosis is a genetic disorder affecting cellular differentiation and proliferation, which results in hamartoma formation in many organs (eg, skin, brain, eye, kidney, heart).
- **FOLLICULITIS**
  - Folliculitis is defined histologically as the presence of inflammatory cells within the wall and ostia of the hair follicle, creating a follicular-based pustule. The type of inflammatory cells varies depending on the etiology of the folliculitis and/or the stage at which the biopsy specimen was obtained.
- **PERIORAL DERMATITIS**
  - Perioral dermatitis (POD) is a chronic papulopustular facial dermatitis. It mostly occurs in women and children. [1, 2] The clinical and histologic features of the perioral dermatitis lesions resemble those of rosacea. Patients require systemic and/or topical treatment and an evaluation of the underlying factors

- **ROSACEA**
  - Rosacea is a common condition characterized by symptoms of facial flushing and a spectrum of clinical signs, including erythema, telangiectasia, coarseness of skin, and an inflammatory papulopustular eruption resembling acne.
- **SEBACEOUS HYPERPLASIA**
  - Sebaceous hyperplasia is a common, benign condition of sebaceous glands in adults of middle age or older. Lesions can be single or multiple and manifest as yellowish, soft, small papules on the face (particularly nose, cheeks, and forehead).
- **SYRINGOMA**
  - Syringoma is a benign adnexal neoplasm formed by well-differentiated ductal elements. The name syringoma is derived from the Greek word *syrinx,* which means reed or pipe.
  - Based on Friedman and Butler's classification scheme, 4 variants of syringoma are recognized:
    - a localized form,
    - a form associated with Down syndrome,
    - a generalized form that encompasses multiple and eruptive syringomas, and
    - a familial form.

TREATMENT:

Treatment for acne depends on the patient's age and sex, the extent and the severity of the acne, how long it has been present, and response to previous treatments.

- Treatment for mild acne includes **topical anti-acne preparations, lasers and lights**
- Treatment for moderate acne includes antibiotics such as **tetracyclines** and/or **antiandrogens** such as birth control pill
- Treatment for severe acne may require a course of **oral isotretinoin** [7,8,9]

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