Melasma: Clinical and Aesthetic approaches

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Etiology

- Melasma is a common, chronic, and recurring disorder of hyperpigmentation arising from hyperfunctional melanocytes that deposit excessive amounts of melanin in the epidermis and dermis
- Melasma is most common in women, especially during reproductive age
- Occurs on the face and other body areas with high amounts of sun exposure
- Many contributing factors in pathogenesis of this condition: genetics, sun exposure, hormonal effects, pregnancy, and medications.
HISTOLOGIC TYPES OF MELASMA

- Epidermal melasma – most common; most treatable form
  - 70% to 94% of cases
  - Hyperpigmented macules of brown color
  - Pigmentation intensified under Wood’s light
- Dermal melasma – less common; difficult to treat
  - Hyperpigmented macules of blue-gray color
  - Pigmentation not intensified under Wood’s light
  - No treatment to date
- Mixed melasma
  - Vascular component of disease

CLINICAL PATTERNS OF MELASMA

- Centrofacial (63%)
  - Malar (21%)
  - Mandibular (16%)
IMPACT ON PATIENT

- Embarrassment
- Social contact may become distressing
- Superstition: Considered bad luck in some cultures
- Treatments may be lengthy, and sun exposure may rapidly reverse all benefits of treatment
- Skin irritation may occur during therapy

QUALITY OF LIFE IN PATIENTS WITH MELASMA

BALKRISHMAN R, CAMACHO MS, SALIESING, HOUSMAN T, CRUMMER S, FELDMAN S, MUMICHOLL A, CHREN M-BJD 2003

- Study of 102 women, quality of life instrument was administered to melasma patients
- High correlations in quality-of-life domains between the MELQOL and the SKINDEX-16, the DLQI, and skin discoloration evaluation
- Social life, recreation and leisure, and emotional well being are most affected life domains
**PRINCIPLES OF MELASMA THERAPY**

- Protection from sun exposure
- Inhibition of tyrosinase activity
- Removal of melanin
- Destruction or disruption of melanin granules

**INHIBITION OF TYROSINE**

- **Hydroquinone (4%)**
  - Has been in use for 50 years
  - Can increase concentration to 10%, but risk of ochronosis also increases
  - OTC formulations (2%) are relatively ineffective
- Usually involves up to 20 weeks of treatment for results
  - Efficacy plateaus after 4-6 months
- Penetration can be increased through concomitant use with tretinoin
- **Arbutin**: derivative of hydroquinone
- **Licorice Extract**, kojic acid
DISRUPTION OF MELANIN GRANULES

- Lasers (careful in skin of color patients)
  - Q-switched Ruby
  - Q-switched Alexandrite
  - Q-switched Nd:YAG
  - Newer Lasers
  - Used in conjunction with lightening agents (pre/post therapy)

REMOVAL OF MELANIN

- Chemical peels
  - 20 to 35% trichloroacetic acid (TCA) peels
  - Modified TCA peels
  - Jessner's Solution
  - Glycolic acid
  - Salicylic acid
- Microdermabrasion (transient improvement)
- Used in conjunction with lightening agents
- Cryosurgery
MELASMA TREATMENT WITH TRIPLE COMBINATION THERAPY

PRE AND POST TREATMENT MELASMA
TRIPLE COMBINATION TREATMENT TO HYDROQUINONE
COMBINATION TREATMENTS FOR MELASMA

Baseline  Post triple combination  Post triple combination and topical cysteamine

CYSTEAMINE

- Simplest aminothiol physiologically produced in human cells from cysteine
- Used as a non-prescription 15 min contact topical cream
- Interest in cysteamine arose as concerns of hydroquinone toxicity increased

In 1966
Chavin injected Cysteamine into black goldfish skin and observed significant skin depigmentation

Oral tranexamic acid (TA) is a synthetic derivative of the amino acid lysine that works as an anti-fibrinolytic agent. TA works via the inhibition of ultraviolet-induced plasmin activity in keratinocytes. TA competitively inhibiting the activation of plasminogen activator (PA) through reversible interactions with its lysine-binding sites inhibiting PA from converting plasminogen to plasmin. Typical dose is 250 mg twice daily. Duration of treatment varies among studies (3-9 months). Screen out patients with history of: thromboembolism, stroke, heart disease. Few side effects noted in most studies: mild GI upset, palpitations, oligomenorrhea, urticarial rash. Can use topical tranexamic acid.

Lee HC, et al. JAAD 2016;75: 385-392
Zhang L et al. Biomed Res Int. 2018; 1683414
TRIPLE COMBINATION AND TRANEXAMIC ACID

- Sunscreen, sunscreen, sunscreen (prefer inorganic, tinted)
- Hydroquinone 4% or triple combination bleaching agents
- Cysteamine topical
- Topical tranexamic acid, topical Vitamin C, microdermabrasion, chemical peels
- Micro-needling with PRP
- Oral tranexamic acid
- Rarely use >4% concentration hydroquinone
- 5 minutes in the sun will undo all your work

MELASMA THERAPEUTIC LADDER