

Gluthathione as a Whitening Agent in the Treatment of Melanos is on Face

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Abstract

Introduction: Facial melanos define as hyperpigmentation and frequently brown to black area about the face especially brow and cheek cause undesirable looking and losing the self-confident. Several current treatments have been used to combat melisma. We have selected glutathione soap for the treatment of facial melanos. Glutathione reduces the production of melanin which is responsible for dark pigment in skin color. Glutathione is an effective treatment to lighten skin, improve melasma (mask of pregnancy) and neutralize hyperpigmentation.

Aims and objectives of the study: To study the effectiveness of glutathione in the treatment of melanos condition on face. **Methodology:** 15 patients with facial melanos were included in the study as per the inclusion and exclusion criteria. Written informed consent was taken for their participation in the study. Detailed history including name, age, sex, address, contact number, marital status, occupation and history of medication were noted. Photographs were taken prior after the usage for documentation. **Results:** Out of 15 patients who are taken treatment for facial melanos with glutathione soap followed for 3 months and there is decrease in the hyperpigmentation in 11 patients. **Conclusion:** Our study results showed that glutathione, when used as soap, has a skin lightening effect.

Keywords: melanos, sun exposure, hyperpigmentation, glutathione

Introduction

Melasma is derived from Greek word melas (black) while chloasma is derived from the word chloazein (green), and since the pigmentation is brown-black, melisma is the preferred term¹.

Melasma is commoner in constitutionally darker skin types being most common in people with light brown colour skins, specifically in people of East and South East Asian and Hispanic origin who live in areas with intense solarultraviolet radiation (UVR).²

Facial melanoses (FM), a common presentation of Indian patients, are complex diagnostic (and even greater therapeutic) problems consisting of few somewhat well defined clinical entities.¹

Pigmentary disorders appear on the face, even if they are benign, regularly cause cosmetic and psychological problems to many people, specially women and can result in the appearance of augmented facial aging. These are supposed by some to be apredictable outward sign of the aging progression.

On the other hand, it is felt by others to be an event that should be delayed or prevented if possible. The facial pigments include solar lentigines, pigmented seborrheic keratoses, melasma, nevus of Ota, and facial hypermelanosis due to other reasons.³

Facial melanosis is defined as hyperpigmentation and regularly brown to black area about the face particularly on forehead and cheek which can cause undesirable looking and losing the self-confident.

Facial pigmentation may develop in a wide range of known and unknown circumstances. The common inducers of facial pigments include Melasma, nevi, macular amyloidosis,⁴ erythema dyschromicum perstans,⁵ photosensitive diseases, pigmented contact dermatitis, drugs, seborrheic melanosis, actinic lichen planus and lichen planus pigmentosus etc. Atopic dermatitis is as well known to develop pigmentation around eye.

Apart from the above conditions, a large number of individuals develop acquired, idiopathic, non-nevoid, facial pigmentations that are commonly distributed in a patterned manner over better locations. Periorbital pigmentation is the utmost well-known entity in this group. This is predominantly common among many black races including India.^{6,7,8} Different conditions similar to fatigue, anxiety, dehydration, too much sun exposure, drugs, hormonal causes, pregnancy and breast-feeding have remained to be the possible precipitating and aggravating factors for facial-pigmentation.

Post-inflammatory hyperpigmentation, shadow effects because of an overhanging tarsal muscles, eye-bags, or a deep tear trough have also been denoted to as possible cause of periorbital pigmentation.^{9,10} This was every so often referred to as constitutional, idiopathic,^{11,12} familial and genetic.¹³ Apart from periorbital pigmentation, existence of other types of idiopathic patterned pigmentation on face has been typically ignored so far, although, some of them are also usually seen.

Collective to all, these highly dominant pigmentations are their apparently idiopathic nature, acquired onset, bilateral distribution, progressive intensity and homogeneously diffuse gray to dark gray or slate-gray color. No well-established consensus seems to exist as regards their status as a disease.

The exact etiology of melasma is unknown but several factors have been occupied. UVR (UVA and UVB) and visible light cause peroxidation of lipids in cellular membranes, leads to generation of free radicals, which cause melanogenesis¹.

Various studies had been ascertained the prevalence of melasma in general population, but all lack randomization. It accounts for 2.5-4% of the patients seen in the dermatology clinic in south Asia & is the most common pigmentary disorder among Indians^{14,15}.

Melasma occurs frequently during pregnancy and menopause.¹⁶ High estrogen and progesterone levels have been implicated in causing melasma, based on the frequent association of melasma with pregnancy, use of oral contraceptives, diethyl stilbestrol administration and hormonal replacement therapy in postmenopausal women.¹⁷ Melasma of pregnancy usually clears within few months of delivery. Sometimes melasma may not resolve with parturition or discontinuation of oral contraceptives. Extensive endocrinologic measurements in some female patients with melanosis have revealed increased levels of luteinizing hormone and lower levels of serum estradiol, which provide subclinical evidence of mild ovarian dysfunction.¹⁸ Although the mechanism of estrogen in precipitating melanosis is unknown. It has been reported that melanocytes of patients with melanosis contain estrogen receptors that stimulate these cells, which become hyperactive.¹⁹

Genetic factors are also involved as suggested by familial occurrence and the higher prevalence of the disease in Hispanics and Asians. More than 30% of patients have a family history of melasma. Identical twins have been stated to develop melasma, whereas other siblings under similar conditions did not.¹⁶

Lutfi RJ et al., evidence suggesting an association between autoimmune thyroid disorders and melasma and the relationship of thyroid disorders to the origin of melasma is presented. All the 108 nonpregnant women, aged 20-56 yr, were distributed into 2 groups for the purpose of this study: 1) melasma, 84 patients; 2) control or standard group, 24 patients from the Dermatology Clinic matched for age and sex. Microsomal thyroid autoantibodies (MCHA) were sought in all subjects. TRH-TSH tests were done in patients with melasma and in those women with goiter and/or positive MCHA tests from the control group. Studies were completed with serum T4, T3, and antithyroglobulin antibody (TGHA) measurements in all patients with thyroid abnormalities.

In patients with melasma, the occurrence of thyroid disorders (58.3%) was 4 times greater than that of control group. The MCHA-negative patients had 1) simple goiter (13.1%), 2) Plummer's disease (2.4%), and 3) TSH hyperresponse to TRH in nongoitrous patients (10.7%). Patients with positive MCHA tests (32.1%) were divided into 2 subgroups. One subgroup covered those women with an apparently normal thyroid gland and thyroid function (n = 7), while the other included all patients with goiter and/or subclinical hypothyroidism (n = 20). Regarding the origin of the melasma, it was found that 70% of women who developed melasma during pregnancy or while using oral contraceptives had thyroid abnormalities compared to 39.4% of patients with melasma of idiopathic reason. Subjects from the control group had a 12.5% incidence of thyroid abnormalities, and only 8.3% had positive MCHA. Estrogen, progesterone, or both could be the triggering factor in the development of melasma in women who have a particular predisposition toward both melasma and thyroid autoimmunity. Patients with idiopathic melasma had a lower frequency of thyroid abnormalities, advising that there may be different genetic patterns linked to autoimmune thyroid disease. They conclude that there is a true association between thyroid autoimmunity and melasma, commonly in women whose melasma develops in the course of pregnancy or after ingestion of oral contraceptive drugs.¹⁹

Drug-induced skin pigmentation is quite common and 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 metals²⁰.

Minocycline pigmentation

Fixed drug reaction to cotrimoxazole

Flagellate pigmentation due to bleomycin

Amiodarone photosensitivity

Carotenaemia after antiepileptic drug usage

Drug-induced pigmentation

Several mechanisms might be involved in the drug-induced changes of pigmentation of the skin.

Certain heavy metals, e.g. iron, may be set down in the dermis following damage to dermal vessels. If deposited in sufficient quantities a characteristic change in skin colour may be seen without any significant rise in melanin.

Some drugs react with melanin to form a drug-pigment complex. Exposure to sunlight often stimulates sun-induced melanin synthesis with formation of these complexes.

Some drugs induce hypermelanosis (accumulation of melanin) as a non-specific post-inflammatory change in predisposed individuals. This is often aggravated by sun exposure.

Some drugs will induce pigmentation directly by accumulating and/or reacting with other substances in the skin²⁰.

Drug/drug group	Clinical features
Antipsychotics (chlorpromazine and related phenothiazines)	Bluish-grey pigmentation, especially in sun-exposed areas Pigmentation is cumulative and certain areas may develop a purplish tint Pigmentation of the conjunctiva in the eye may occur, along with cataracts and corneal opacities
Phenytoin / anticonvulsants	10% of patients develop pigmentation of the face and neck resembling chloasma (noticeably defined, roughly symmetrical dark brown patches) Disappears after a few months when drug has been stopped.
Antimalarials	About 25% of patients receiving chloroquine or hydroxychloroquine for several years develop bluish-grey pigmentation on face, neck and often lower legs and forearms Continuous long-term use may lead to blue-black patches, specially in sun-exposed areas Nail beds and corneal and retinal changes may possibly develop
Cytotoxic drugs	Busulfan, cyclophosphamide, bleomycin and adriamycin have all produced hyperpigmentation to some degree Banded or diffuse pigmentation of nails often occurs
Amiodarone	Blue-grey pigmentation in sun-exposed areas (face and hands) Photosensitivity occurs in 30-57% of patients whilst 1-10% show skin pigmentation Skin pigmentation is reversible but may proceed up to one year for complete resolution after the drug has been stopped
NSAIDs	Often associated with fixed drug eruptions (drugs that cause a single or few sharply demarcated erythematous lesions which resolve promptly but leave a local brown pigmentation) Can occur on the face, extremities and genitalia.

Several current treatments have been used to combat melisma. These treatments include hypopigmenting agents and chemical peels, dermabrasion and lasers that are invasive in nature²¹. We have selected glutathione soap for the treatment of facial melanosis.

Glutathione is a significant component of the collective antioxidant defences, and a highly potent antioxidant and antitoxin in its own right. The -SH group of GSH is important for many facets of cell function, and early suggestions that GSH regulatory roles at the cell level.²²

Glutathione is a tripeptide of three amino acids: glutamate, cysteine, and glycine and denotes the most prevalent antioxidant in the human body. Glutathione is a protein which is naturally produced in the body and has three essential crucial protective functions: as an antioxidant, booster of immune system, and a detoxifier. As an anti-aging protein, it supports in the breakdown of oxidized fats, as it is significantly required for carbohydrate metabolism, therefore enhancing weight loss. It decreases wrinkles and dark spots, whitens and nourishes the skin while efficiently detoxifying the body. Glutathione makes the skin smooth, fresh, and radiant.²⁰

A high dose or concentration of Glutathione in our skin helps inhibit melanin (the dark pigments). More melanin content in the body, makes the skin the darker. Thus if an individual who uses a Glutathione-based soap on her face and body will eventually achieve a lighter and flawless skin tone. Microexfoliation is extra benefit of using a Glutathione-based soap. It exfoliates the topmost layer of the skin to remove that dead and dull skincell that's causing pimples/acne. Also it feels like having a microdermabrasion because your skin will feel soft and smooth after using it.²³

Glutathione is also a natural way of lightening the skin. It is also used in treating skin problems like melasma, hyperpigmentation, acne or pimple scars, sun spots, freckles, uneven skin tone, etc.²³

Aims and Objectives of the Study

To study the effectiveness of glutathione in the treatment of melanosis condition on face.

Source of data: This consists of both male and female patients attending the dermatology and STD outpatient department from from March 2014 to april 2014 at Rajiv gandhi medical institute(RIMS) , kadapa.

Method of Collection of Data

Fifteen patients with melanosis condition on facewere included in the study as per the inclusion and exclusion criteria.

Inclusion criteria: Male and female patients (Age group 15-70 years)

Exclusion criteria: Age < 15 years and >70years.

Methodology

15 patients with facial melanosis were included in the study as per the inclusion and exclusion criteria. Written informed consent was taken for their participation in the study. Detailed history including name, age, sex, address, contact number, marital status, occupation and history of medication were noted. Photographs were taken prior after the usage for documentation .Selected patients were thoroughly examined and investigated.

Results

Out of 15 patients who having melanosis condition on face 5 patients has taken photograph and followed for 3months.

Out of 15 patients who are taken treatment for facial melanosis with glutathione soap followed for 3months and there is decrease in the hyperpigmentation after 3 months of usage, we had taken 2 photographs out of 11 patients.

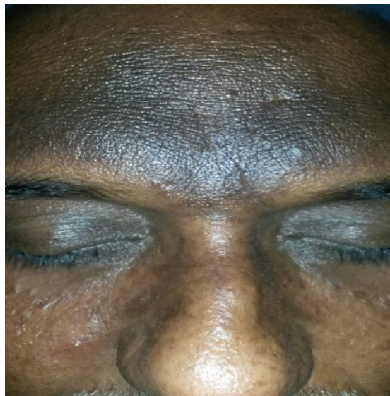
Patient-I



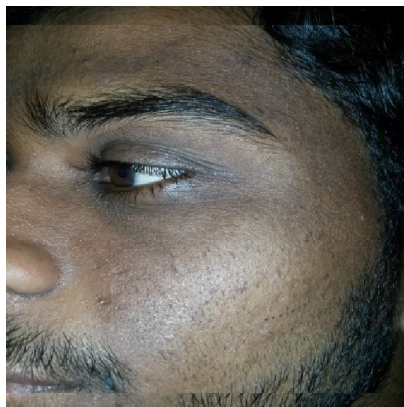
Patient-II



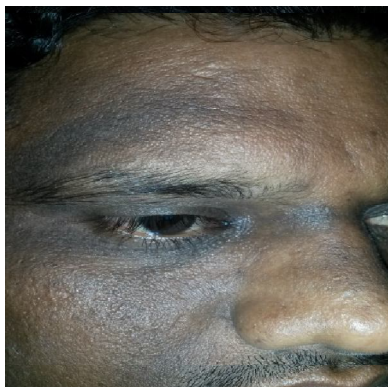
Patient-III



Patient-IV



Patient-V

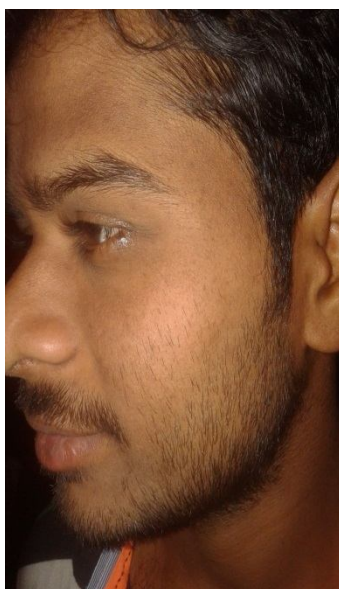


After the 3months review of the patient who were on the glutathione soap, skin lightening effect was observed in all most all the patients and we had collected the photograph of patient 3 & 4.

Patient-III



Patient-IV



Discussion

Melasma is a common hyperpigmentation disorder that typically affects women. However, in one study it has been reported that up to 10% of white individuals seeking treatment for melasma are men.²⁴ but in our study majority are males (86.6%) were participated in our study.

We observed mainly in the age group of 25- 50 years (80%) this is supported by Griffiths CEM et al., showed on average of 30 years at onset.²⁵

There are several theories describing the etiology of melasma in men. Chronic sun exposure seems to be the most likely cause in most cases or at least the most important exacerbating factor. Mostly all our patients had a history of sun-exposure. That out of 15 patients 12(80%) patients had a history of sun exposure similarly it was supported by Vazquez et al reported 81.4% (22/27) of patients had a history of chronic sun exposure and 66.6% (18/27) noticed worsening of their condition with sunlight exposure.²⁶ Griffiths CEM et al showed that sunlight was an exacerbating factor in 98% patients.²⁵

In our study 4 (26.6%) patients had family history of melasma this is supported by Vazquez et al reported that 70.4% (19/27) of men in their study had a family history of melasma in first- or second-degree relatives, though none of the men reported melasma in their fathers.²⁶ Griffiths CEM et al 47% patients gave a positive family history of first degree of relative being affected.²⁵

Drug in take had no significant association with occurrence of melasma in our patients. And no patient had a history of thyroid disorder.

Ours is a pilot study, aimed to know the effect of glutathione in soap form. Though all most all the patients had decreased effect of hyperpigmentation, it is supported by Nutthavutharjinpathana et al at 4 weeks, the melanin indices decreased consistently at all six sites in subjects who received glutathione orally.²⁷

Limitations

Pilot study, sample size is less, cost is more, may be temporary lightening effect (future studies need to be addressed)

Conclusion

Our study results showed that glutathione, when used as soap, has a skin lightening effect. The fact that glutathione affects mainly the melanin indices and UV spots in the sun-exposed areas is very interesting. This fits well with the hypothesis that it affects only new melanogenesis and really not the existing pigment

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