Precipitating factors of melasma in patients attending dermatology out patient clinic in Al-Imamain Al-Kadhumain Medical City

Department of medicine

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DEDICATION

I dedicate this work to my parents,for putting up with the stress and the complaining throughout the past six years.

Acknowledgement

I want to thank my supervisor assist Professor Dr. Hasan Nasir for his encouragement, guidance and support in the preparation of the study. I want also to thank the doctors of the Dermatology outpatient clinic in **Al-Imamian Al-Kadhumain Medical City** for their help.

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Abstract

Background: Melasma is a common, acquired hypermelanosis that occurs in sun exposed areas mostly face.

The most important factor in the development of melasma is exposure to sunlight. Ultraviolet (UV) radiation .

The exact mechanism by which pregnancy affects melasma is unknown, but hormonal influences play a role in some individuals.

Aim of study : Is To assess the factors precipitating melasma in patients attending the dermatology clinic in **AlKadhmia teaching hospital.**

Patient and method : 25 female patients was collected **from Al-kadhymia teaching hospital** at the outpatient clinic of dermatology from November 2018 till March 2019 .

Results : majority of patients were in age between 25 & 35 years (60%) . mostly married women (88%) . mostly were house wife (88%).Most of facial involvement were in malar area (44%). Pregnancy was related condition in (64%). Stressful events was provoking factor in (64%). Most of the patients have prolonged sun exposure (84%). Most of the patients had positive facial hair eplation (68%).

Conclusion: The most common facial involvement is malar area,and the most common age group of melasma is from 25-35 with increase incidence with pregnancy ,sun exposure and stressful events mostly in a housewife married females not using sunblock.

Key words:Melasma,Pregnancy.

Introduction

Melasma (a term derived from the Greek word ‘melas’ meaning black) is a common, acquired hypermelanosis that occurs in sun exposed areas, mostly on the face, occasionally on the neck, and rarely on the forearms. The term, ‘chloasma’ (from the Greek word, ‘chloazein meaning ‘to be green’) is often used to describe melasma developing during pregnancy; but the pigmentation never appears to be green, therefore the term, ‘melasma’ is preferred.[1]

Incidence and epidemiology

Melasma was more prevalent in women (97.5%) and in Fitzpatrick skin phototypes II (12.8%), III (36.3%), and IV (39.7%). Skin phototypes II and III and family history of melasma had early onset of the disorder when compared with skin phototypes IV, V, and VI . Extra-facial melasma was more frequent in postmenopausal women compared with those who were not experiencing menopause (14.2% vs. 3.5%).[2] Its prevalence in pregnancy is around 50-70%.[3] Melasma can also occur in men, though less comm.[4]

Etiology

Several factors have been implicated in the etiology of melasma. These are genetic predisposition, UV radiation, thyroid disease, pregnancy, oral contraceptive pills (OCPs) and drugs such as phenytoin.[5][6][7][8]

A genetic predisposition is a major factor in the development of melasma . In a global study of 324 women with melasma, 48% reported a positive family history of the condition.[9]Identical twins have been reported to develop melasma, [10]while other siblings under similar conditions did not.[10]

Another major factor in melasma is exposure to sunlight. Ultraviolet radiation can cause per-oxidation of lipids in cellular membranes, leading to generation of free radicals, which could stimulate melanocytes to produce excess melanin. [11]

Hormonal influences play a role in some individuals. The mask of pregnancy is well known to obstetric patients. The exact mechanism by which pregnancy affects melasma is unknown. Estrogen, progesterone, and melanocyte-stimulating hormone (MSH) levels are normally increased during the third trimester of pregnancy. Nulliparous patients with melasma have no increased levels of estrogen or MSH, but they may show elevated levels of estrogen receptors within lesions. In addition, the occurrence of melasma with estrogen- and progesterone-containing oral contraceptive pills and diethylstilbestrol treatment for prostate cancer has been reported.[5]

One study found a four-fold increase in thyroid disease in patients with melasma when compared with matched controls. A case report of two

women who developed melasma after sudden and profound emotional stress implicated the release of MSH by the hypothalamus as a cause.[12]

Pathogenesis

The pathophysiology of melasma is uncertain. A direct relationship with female hormonal activity appears to be present, because melasma occurs more frequently in females than in males and commonly develops or worsens during pregnancy and with the use of oral contraceptive pills. Indeed, one half of melasma cases present initially during pregnancy. Additionally, the expression of estrogen receptors appears to be up-regulated in melasma lesions.[4]

The most important factor in the development of melasma is exposure to sunlight. Ultraviolet (UV) radiation is known to induce increased production of alpha-melanocyte–stimulating hormone and corticotropin, as well as interleukin 1 and endothelin 1, all of which contribute to increased melanin production by intraepidermal melanocytes. Fibroblasts located in the dermal layer of the skin may also contribute to the development of melasma; over-expression of the tyrosine kinase receptor c-kit and certain stem cell factors have been identified in melasma lesions, and these are believed to increase melanogenesis.[13]

Histology

Historically, melasma has been classified as having three histologic variants: epidermal, dermal, and mixed,[14] In the epidermal type, there is increased pigment throughout the layers of the epidermis, particularly in the basal and suprabasilar layers. Melanocytes in the epidermis are generally enlarged, have prominent dendrites, and increased melanosomes.[15][16] Although one study suggested an increase in melanocyte number, most studies report no change in the number of epidermal melanocytes.[16] Epidermal pigmentation may be accentuated with a Wood's lamp which may help distinguish epidermal and dermal subtypes. The dermal subtype has melanophages in the superficial and deep dermis. Additionally, a lymphohistiocytic infiltrate may be seen in the dermis in areas with increased melanin deposition, Dermal findings can also include solar elastosis and an increase in blood vessels.[15][17] Mixed melasma often displays combined histologic features of the epidermal and dermal subtype.[17]

Clinical presentation

History

Patients may inquire about progressive hyperpigmentation of the face, which may be temporally related to pregnancy or to the use of oral contraceptive pills.

Intense or long-term exposure to sunlight worsens the condition and may precipitate melasma, but because the development of pigmentation is often insidious, patients may not recognize the association.[11]

Physical examination

The macular hyperpigmentation of melasma is commonly tan to brown. Blue or black may be evident in patients with dermal melasma. The distribution is one of three patterns.[11] Centrofacial involves the forehead, cheeks, nose, upper lip, and chin. Malar involves solely the nose and the cheeks.[11] Mandibular affects the ramus of the mandible. It is unclear why certain characteristic areas of the face are most commonly involved, but it is believed that sebaceous gland density and activity in these regions may be involved.[11] A rare pattern confined to the forearms is seen in women receiving exogenous progesterone and in Native Americans, The excess melanin can be visually localized to the epidermis or the dermis by use of a Wood lamp (wavelength, 340-400 nm).[11] Epidermal pigment is enhanced during examination with a Wood light, whereas, dermal pigment is not. Clinically, a large amount of dermal melanin is suspected if the hyperpigmentation is bluish black. In individuals with dark-brown skin, examination with a Wood light does not localize pigment, and these patients are thus classified as indeterminate.[11]

Centro-facial distribution area of melasma.

Malar distribution area of melasma

Treatment

Therapeutically, a sunblock with broad-spectrum UVA (even visible light) coverage should be used daily; it will modestly improve the melasma, but more importantly, will enhance the efficacy of bleaching creams.[18] Bleaching creams with hydro- quinone are the gold standard and are moderately efficacious, containing 2% (available over the counter) to 4% hydroquinone.[18] Tretinoin cream may be added to increase efficacy.[18] Tretinoin alone may reduce melasma, but it is not as effective as hydroquinone. The combination of hydroquinone and tretinoin, administered with a topical corticosteroid, has been called “Kligman’s formula” and is the most effective topical regimen available to treat melasma.[18] Twice-weekly application of the triple combination can be effective for maintenance.[18] Overuse can lead to fixed erythema and telangiectasis, acne form eruptions, and hypertrichosis. [18] When 4% hydroquinone is ineffective, higher concentrations may be recommended. [18]Satellite pigmentation and local ochronosis are potential com- plications from use of these higher-concentration preparations.[18] Methimazole, azelaic acid, kojic acid, vitamin C, and arbutin are other therapies with minimal to moderate efficacy. [18] Many of these agents are added to cosmetic products for skin lightening and may be combined, because they act on different steps of melanogenesis. [18] All these topical

agents are generally less effective than 4% hydroquinone but may be used in the patient intolerant of hydroquinone.[18] Oral tranexamic acid may play a role as a systemic agent in treating refractory melasma.[18]

Various surgical procedures, such as peels and light-based treatments, have been proposed as effective for melasma, but results are mixed. Peels with glycolic acid, salicylic acid, trichloroacetic acid (TCA), and tretinoin 1% have not reproducibly enhance the efficacy of 4% hydroquinone and can cause hyperpigmentation if irritation ensues.[18] The use of light-based modalities for the treatment of melasma should be approached with caution.[18]These therapies may be complicated by hyper- pigmentation, irritation, hypopigmentation, and even scarring, if not used appropriately.[18] Intense pulse light (IPL) can improve melasma, but there is a high relapse rate.[18] Pulse dye laser may enhance combination topical treatment, and improvement may continue after therapy is discontinued.[18] Q-switched neodymium:yttrium-aluminum-garnet (Nd:YAG) laser therapy can lead to increased pigmentation.[18]

Aim of the study

Is To assess the factors precipitating melasma in patients attending the dermatology clinic in **Al-Imamain Al-kadhumain Medical City.**

Patients and methods

This cross-sectional study was done in **Al--Imamain Al-kadhumain Medical City.** at outpatient clinic of dermatology from November 2018 till March 2019 and the information was collected from 25 female patients.

All those patients were diagnosed by dermatologists in the hospital depending on history taking and the clinical picture, and this research was done by subjecting the patients to a lot of questions, the information were collected according to the Questionnaire form is listed in page 26.

Results

A total number of 25 female patients with melasma were enrolled in this study.

- There ages range between 25 & 55 years with mean age of 40 years.

- Most of the patients were married n=22 (88%)and just three cases (12%) were not.
- Most of the patients were house wife n=22 (88%)and only three (12%)patients at work .

- Most of the facial involvement were in the malar area n=11 cases (44%)and follow by centrofacial area of nine cases(36%)then at least is the mandibular area of five cases (20%).

- Sixteen cases give history of pregnancy before the appearance of melasma.
- Four cases(16%) were use oral contraceptive pills.

- Stressful events found to be provoking factor in sixteen (64%) case.

- Twenty one (84%) patients have a prolonged sun exposure.

- Seventeen (68%) case have had hair epilation.

- eight (32%) cases have melasma for less than one year with seventeen (68%) cases for more than one year.
- Only three cases (12%) using sunblock daily.

Table 1: Age group of the patients

Age group	Number of patients	Percent (100%)
(25-35)	15	60
(36-45)	8	32
(45-55)	2	8
Total	25	100

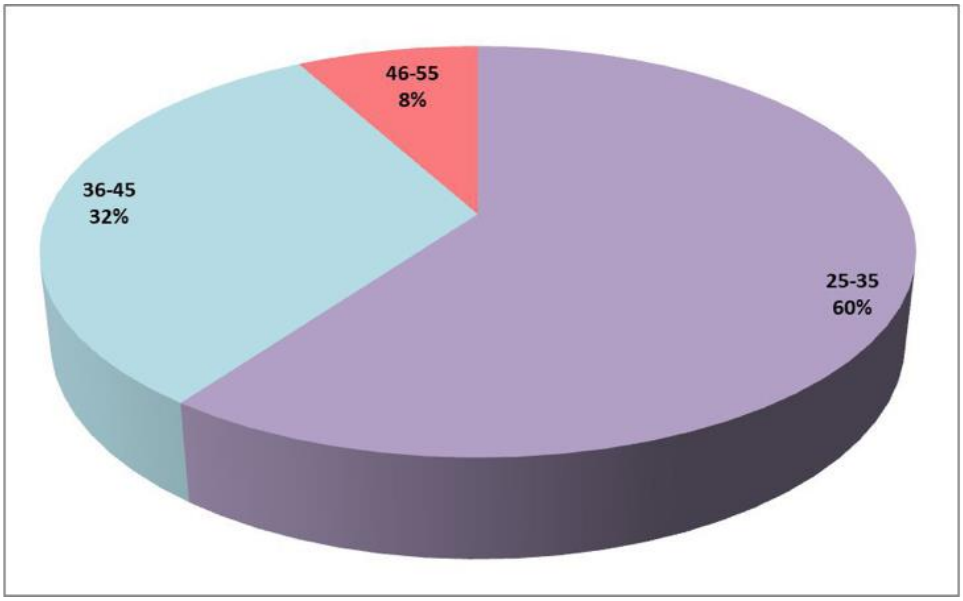
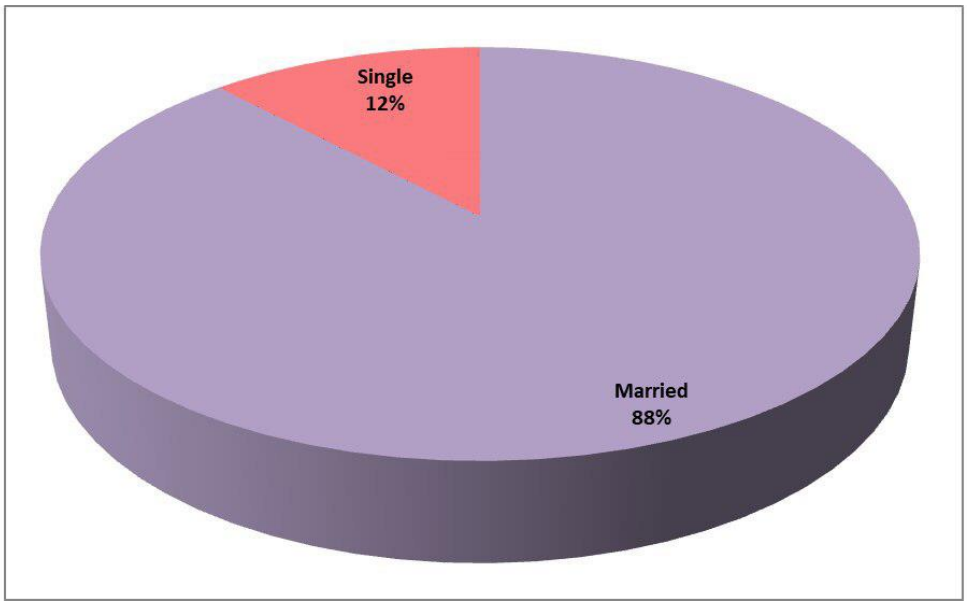


Figure (1):Age group of cases

Table 2: marital state of patients

Marital state	Number of patients	Percent (100%)
Positive	22	88
Negative	3	12
Total	25	100



Figure(2):Marital status cases

Table 3: Distribution of patients related to occupation

Occupational state	Number of patients	Percent (100%)
House wife	22	88
At work	3	12
Total	25	100

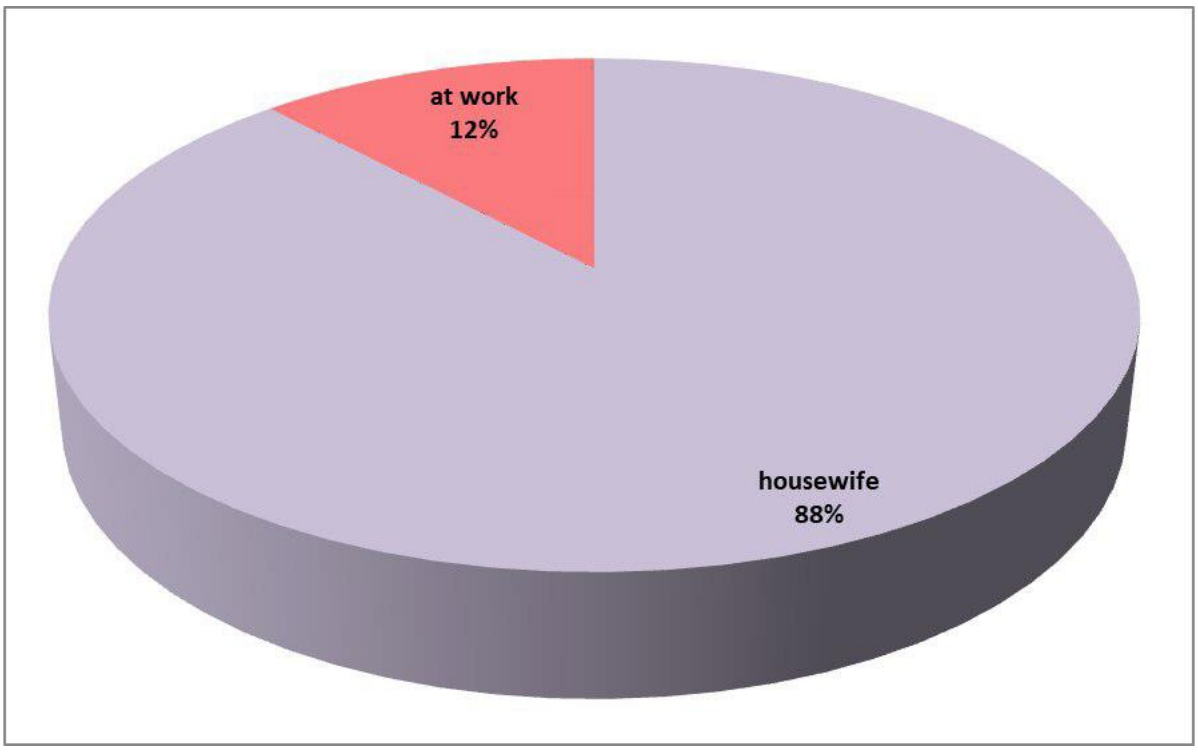


Figure (3):Distribution of patients related to occupation

Table 4:sites of facial involvement

Sites of involvement	Number of patients	Percent (100%)
Malar	11	44
centrofacial	9	36
Mandibular	5	20
Total	25	100

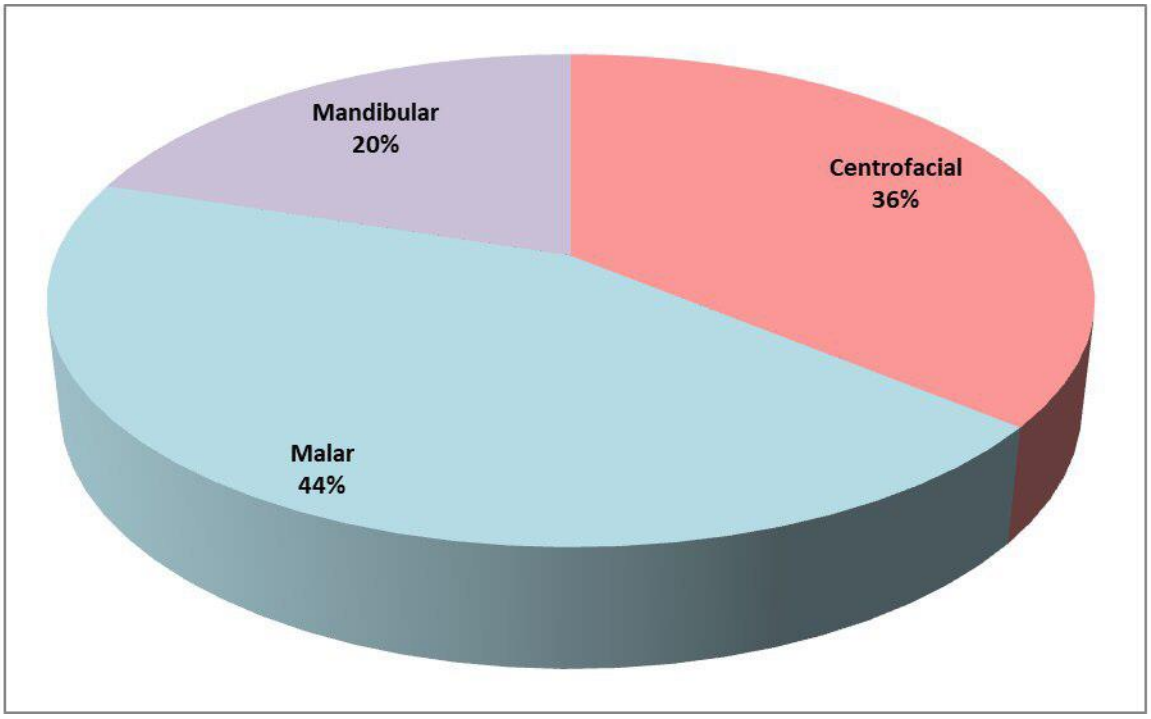


Figure (4):sites of facial involvement

Table 5:Distribution of patients related to pregnancy

Pregnancy	Number of patients	Percent	
Positive	16	73	
Negative	9	27	
Total	22	100	

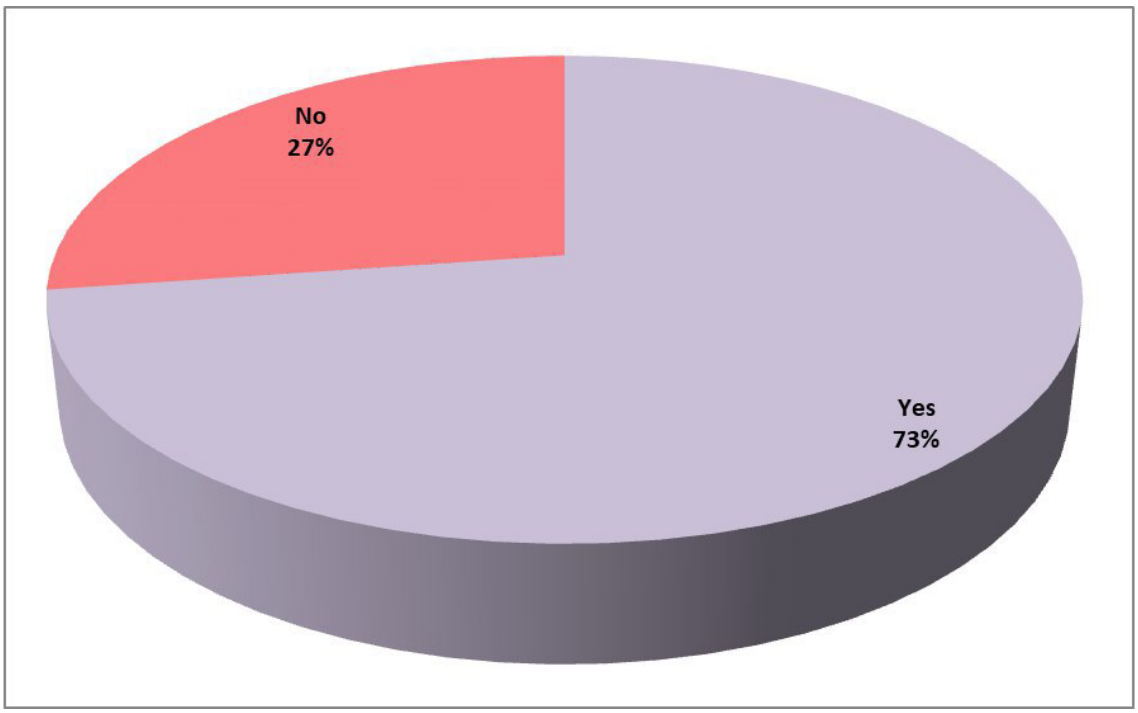


Figure (5):Distribution of patients related to pregnancy

Table 6:Distribution of patients related to stressful events

Related to stress	Number of patients	Percent
Positive	16	64
Negative	9	36
Total	25	100

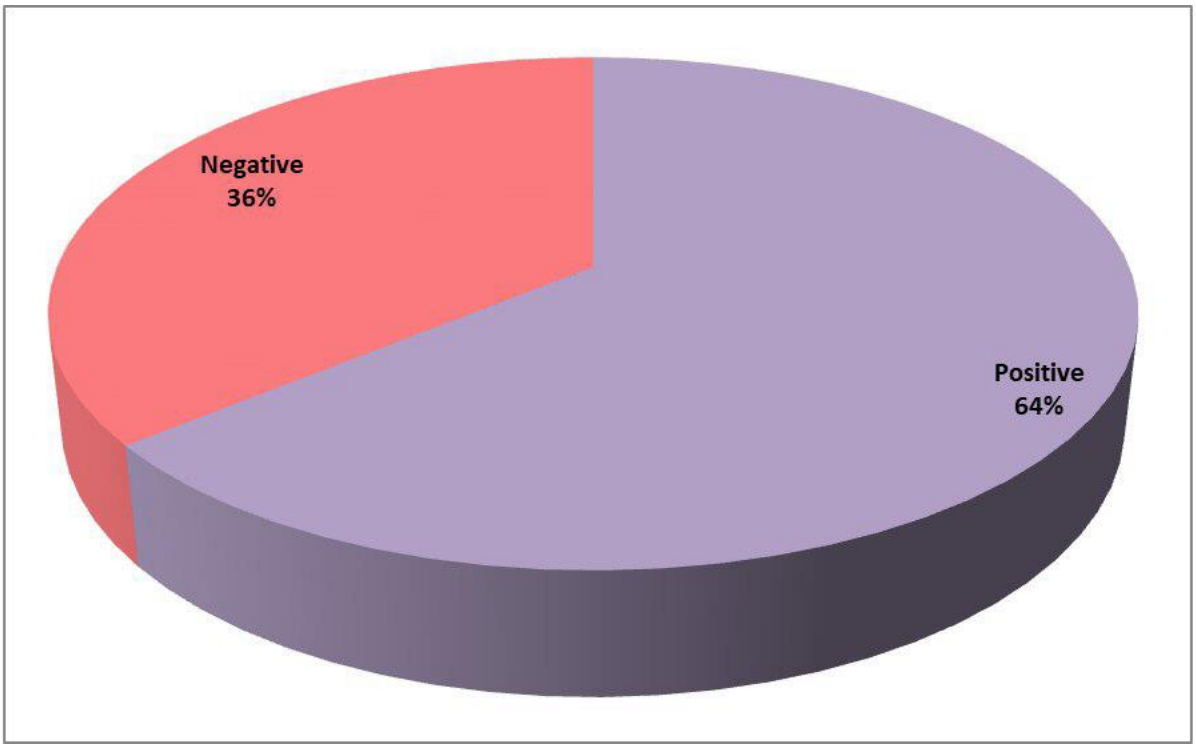


Figure (6):Distribution of patients related to stressful events

Table 7:prolong sun exposure

Prolong sun exposure	Number of patients	Percent (100%)
Yes	21	84
No	4	16
Total	25	100

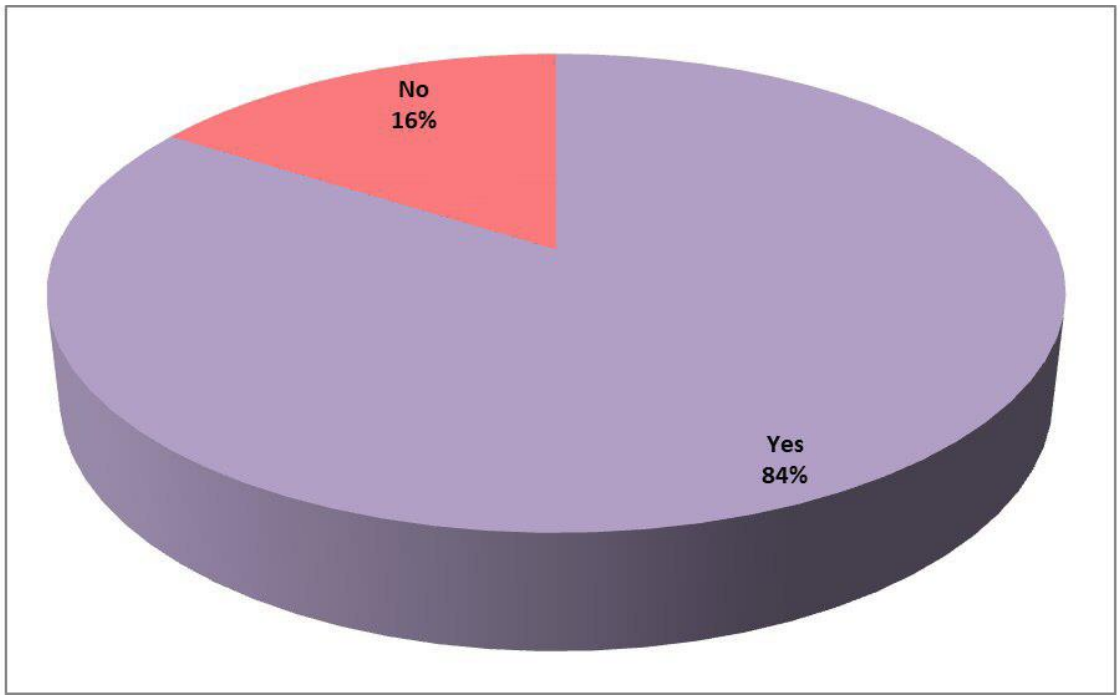


Figure (7):Prolong sun exposure

Table 8:facial hair epilation

Facial hair epilation	Number of patients	Percent (100%)
Yes	17	68
No	8	32
Total	25	100

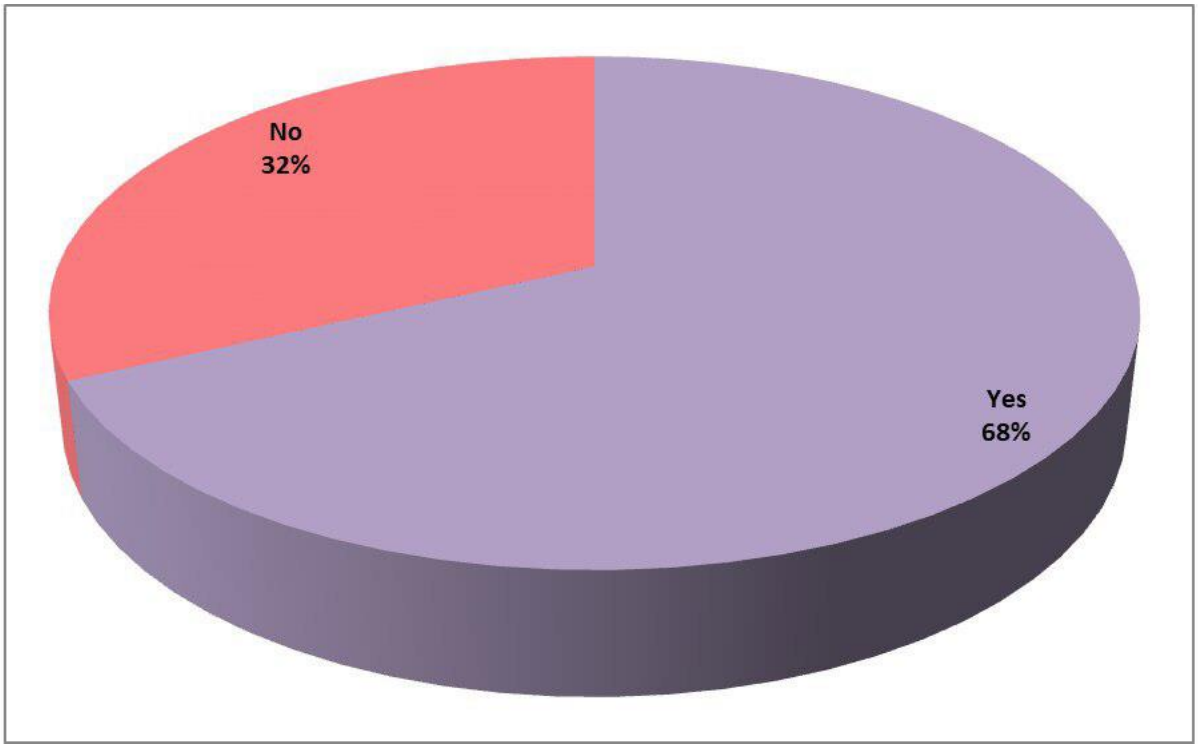


Figure (8):Facial hair epilation

Table 9:Duration of the disease

Duration of disease	Number of patients	Percent (100%)
More than one year	17	68
One year and bellow	8	32
Total	25	100

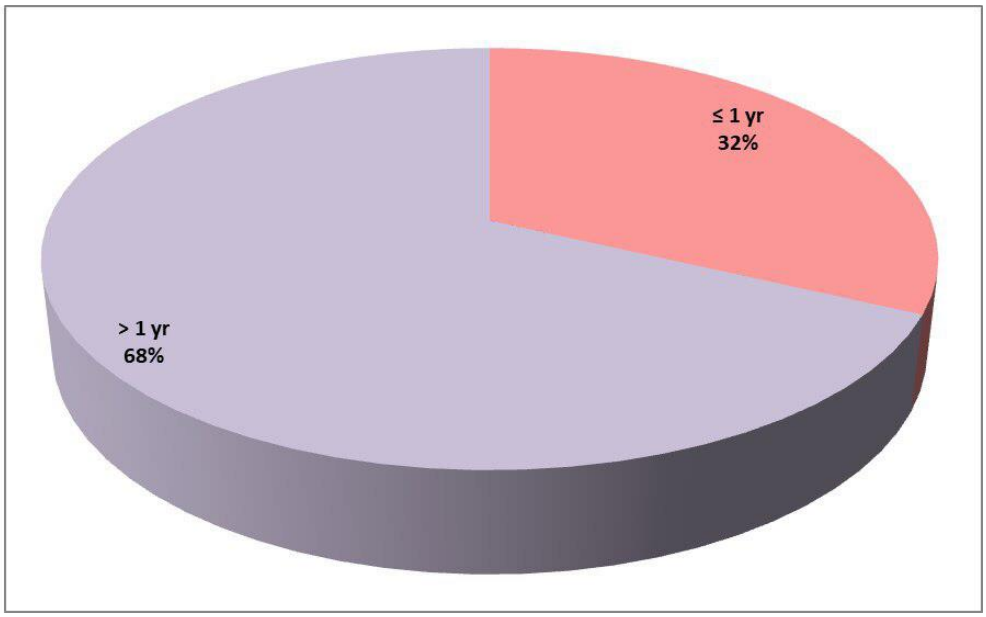


Figure (9):Duration of disease

Table 10:Use of sunblock

Using sunblock	Number of patients	Percent (100%)
No	22	88
Yes	3	12
Total	25	100

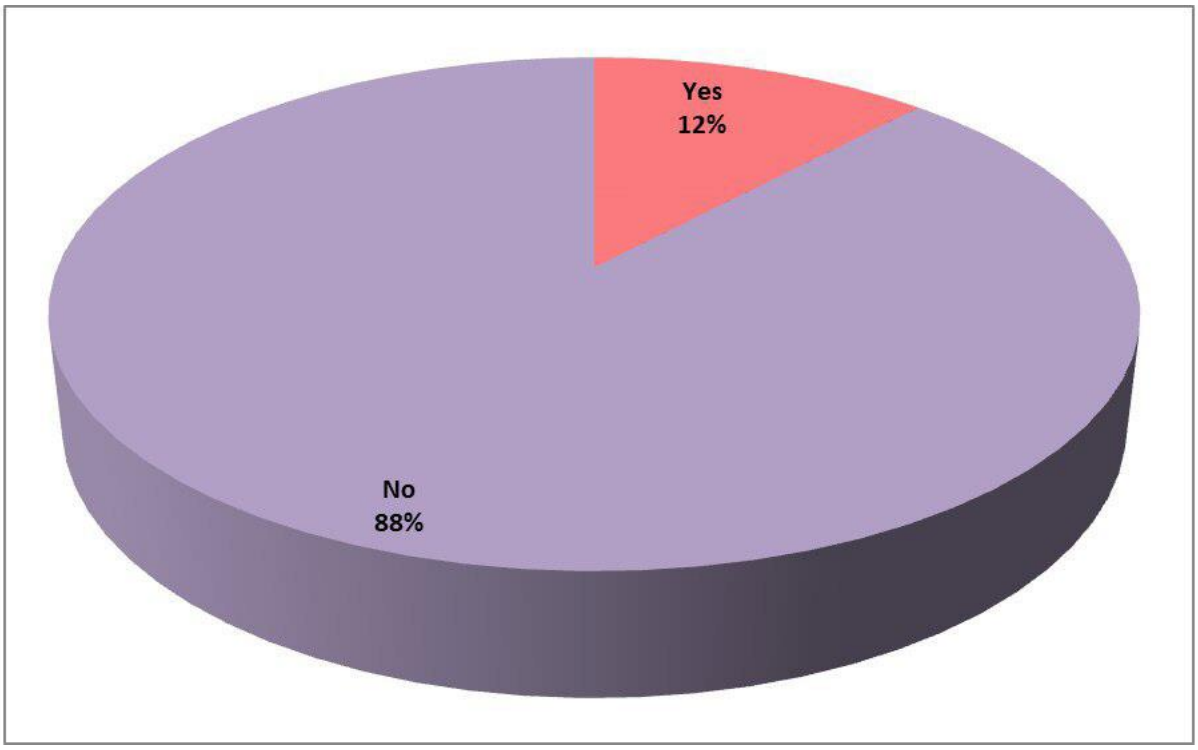


Figure (10):use of sunblock

Discussion

Melasma is a common , acquired hypermelanosis that occurs in sun exposed areas. [1]

Its pathogeny is not yet completely understood, although there are some known triggering factors such as sun exposure, pregnancy, sexual hormones, inflammatory processes of the skin, use of cosmetics, steroids, and photosensitizing drugs. There is also a clear genetic predisposition, since over 40% of patients reported having relatives affected with the disease.(27)

25 patients were encountered in this study ,the mean Age was 40 years which is higher than other study was 30 years. [19] and 32:5 years in, [20]the maximum number of patients were in the age group of (25-35)(60%) similar to this study ,[19]),due to hormonal effect in the reproductive age, and there is predominant of marital states in this study (88%) similar to study,[22]) because the married women more prone for pregnancy and its hormonal effects.

The hyperpigmented area in the face mostly at the malar area (40%) which is similar to the study. [21]

In this study pregnancy was precipitating factor for the appearance of melasma 73% and in another also was a precipitating factor but in a lower percentage 52%,[24] due to hormonal effects and at the same journal was the Use of OCPs relation is 20% same as my study 16%. [23]

In this study the stressful events related to the appearance of melasma in a 64% similar to.[24]) maybe due to high level of social and family problems in our country.

Prolong sun exposure in this study was an important factor 84% and also in study [25] which was the most frequent precipitating factor 90% ,because UV rays from the sun trigger the skin's melanocytes to produce more melanin.

In this study the duration of disease varied from 3 months to 17 years which is differ from the study [25] which was from 2 to 6 years.

The Use of sunscreen in this study was limited 12% not like a study [26] which was 91% , supposing the educational and socioeconomic states of our patients.

CONCLUSION

1-The most common facial involvement is Malar area.

2-The most common age group of melasma is from 25-35.

3-The incidence of melasma greatly increase with pregnancy,sun exposure and stressful events.

Recommendations

Frequent use of sunblock SPF of at least 30, UV protective clothing, sunglasses, and a wide-brimmed hat are also good forms of sun protection especially during the day from 10 a.m. to 4 p.m. ,with limiting time to sun exposure.

The Questionnaire Form

- **Name:**
- **Age:**
- **Marital status :**
- **Occupation :**
- **Site of facial involvement :centrofacial( )Malar ( ) Mandibular( )**
- **Pregnancy : Yes: No:**
- **OCPs: Yes: No:**
- **Any stressful events : Yes: No:**
- **Prolong sun exposure :Yes: No:**
- **Facial hair epilation : Yes: No:**
- **Duration of the disease :**
- **Use of sunblock: Yes : No:**

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