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A DESCRIPTIVE STUDY ON PRESCRIPTION PATTERN AND MEDICATION ADHERENCE IN PATIENTS WITH MELASMA

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ABSTRACT

Melasma is an acquired form of sun-exposed region hyper melanosis. The patient usually presents with tan to brown spots. The etiology and pathogenesis of melasma have been linked to a variety of factors, including heredity, sun exposure, race, pregnancy, oral contraceptives, cosmetics and hormonal factors. An observational descriptive study was conducted among 70 patients at out-patient Department of dermatology, ESIC MC- PGIMSR & Model Hospital, Rajajinagar, Bengaluru. Data collection was done using Self-designed patient profile form: containing details of patient demography, prescription pattern of drugs, complaints, diagnosis, management, comorbidities etc. The subjects were administered Morisky Medication –Taking Adherence Scale-MMAS (4-item) to obtain relevant data on medication adherence of patients. The Majority of patients were females and were age group of 36-45 years. Most of the patients presented for treatment within 1-5 years of onset. The study reveals that generic prescription is 52% and suggests that effort must be made to encourage multitude of benefits including cost effectiveness. Sunscreens and skin lightening agents were the most commonly prescribed medication. Majority of the patients have good medication adherence and reduced melasma evaluation. This study suggests that there is immense scope of improvement in prescribing in this department.

KEYWORDS: Melasma, Prescription pattern, Medication adherence, comorbid condition, duration of lesions, Sunscreen, Skin lightening agents.

INTRODUCTION

Melasma is an acquired form of sun-exposed region hypermelanosis. It manifests as confluent or punctate symmetrical hyperpigmented macules and patches. The most typical regions are the cheeks, upper lip, chin, and forehead, while it can also happen in other sun-exposed areas. Melasma that develops during pregnancy is sometimes referred to as "chloasma," a synonym. Women are much more likely than men to get melasma. 90% of the time, it is women.[1] Though typically observed in women, it can also occur in men. The patient usually presents with tan to brown spots.[2] The etiology and pathogenesis of melasma have been linked to a variety of factors, including heredity, sun exposure, race, pregnancy, oral contraceptives, cosmetics and hormonal factors.[3]

Melasma doesn't directly influence health, but it has a significant impact on patients' social lives and emotional wellbeing.[4] More than 50% of cases of melasma are said to occur in pregnant women with white skin. [5] However, it was discovered to be close to 10% in India.[5] There is limited knowledge on the etiology of melasma among pregnant patients, despite the fact that it negatively impacts patients' quality of life.[6] Typically, hydroquinone in an alcoholic glycol or cream basis is applied to the skin to treat melasma.[7]

Melasma has been identified as a condition of photoaging even though its pathophysiology is yet unknown. The release of vascular mediators that promote angiogenesis and the consequent activation of melanocytes have various known etiological causes.[8]

Factors implicated include the following

- UV light - UV light is hypothesized to cause reactive oxygen species and encourage the development of melanin (melanogenesis) in the skin. UV light can penetrate the epidermis of the skin.[9] Additionally, it has been demonstrated that shorter visible light wavelengths, particularly those with darker skin tones like blue and purple light, can cause long-lasting hyperpigmentation.[10] Increased skin pigmentation can

result from cumulative sun exposure and frequently lasts for a long time.

➢ Family history is a significant risk factor for melasma development. According to certain research, up to 60% of patients have a favorable family history, which raises the possibility of a genetic predisposition.[9,11]

➢ Hormonal influences - Oestrogen and progesterone, which are found in oral contraceptives, menopausal hormone therapy, intrauterine devices, and implants, may play a role in the development of melasma, especially given the increased prevalence of the condition during pregnancy.[12,13,14] Specific oestrogen and progesterone receptors present in human skin mediate the actions of oestrogens and progesterones. One-fourth of the affected ladies have these attributable to them.[9] Forearm extrafacial melasma has been linked to topical oestrogen replacement treatment and the perimenopausal stage.[15] Progesterone is regarded to be less of a mediator than oestrogen.

➢ Medication - Some fragrant soap and cosmetic product chemicals may have a phototoxic effect that might trigger the development of melasma. [18] Anti-epileptic, antimalarial, antipsychotic, and cytotoxic/antineoplastic drugs are some examples of systemic medicines that have been reported to potentially cause hyperpigmentation.[19]

➢ Heat exposure - through thermal and UV damage, it has been hypothesized that prolonged occupational heat exposure or exposure to cooking fires may contribute to the emergence of melasma.[20]

Serum levels of thyroid stimulating hormone, antithyroid peroxidase, and antithyroglobulin antibody were found to be higher in melasma patients compared to those without the condition.[21] It has been proposed that several pathways, including the melanocyte-stimulating hormone/cyclic adenosine monophosphate are involved in the upregulation of tyrosinase.[16]

Depending on the amount of melanin deposition in the epidermis (epidermal melanosis) and/or dermis (dermal melanosis), melasma may be classified as epidermal, dermal, or mixed kinds.[18] An expert dermatologist can determine the degree of pigmentation using a mix of clinical, Wood's lamp, and dermoscopic findings.

The amount of skin pigment can be determined with the aid of a Wood's lamp, which is a cheap, non-invasive, and generally simple to use instrument. Hyperpigmented skin will be improved, exposing border contrast and variation in fluorescence, by UV light emission (320-400 nm) in a dark environment.[23] Additionally, dermal melasma does not typically exhibit accentuation under light, whereas epidermal melasma does.[24] Dermoscopic analysis of epidermal melasma reveals that it is primarily brown in color, with sporadic islands of brown reticular network and small black granules on the surface. Dermal melasma has reticuloglobular pattern, telangiectasia, and archiform structures as its dermoscopic features. It also has a brown to ash grey color with a more uniform participation and no areas of pigmentation sparing.[24] Epidermal and dermal subtypes of melasma are both present in mixed melasma.

Melasma might take a while to respond to therapy, especially if it has been present for a long time.[18] Box 1 contains a list of general treatments for melasma. For the treatment of melasma, poor prognostic indicators include

- Fitzpatrick skin types III–V
- Genetic and familial predisposition
- Long-standing disease ≥2 years persisting despite treatment
- History of procedural interventions (eg lasers, microneedling)
- History of treatment by ≥2 physicians (possibly suggesting long duration and recalcitrant disease)
- Long-term self-treatment with topical steroids
- Ochronosis from hydroquinone use – either long term or high strength
- Mixed-type melasma.

General measures for melasma

- Determine the causes of the patient's symptoms and indicators. Protecting against visible light should be a top priority all year round.
- When outdoors on bright days, wear a hat with a wide brim.
- Reduce exposure to heat and light in the workplace and at home.
- Apply a broad-spectrum, extremely high protection factor (SPF 50+), daily, all-year-round sunscreen to your entire face for protection from UVA, UVB, and visible light.
- Iron oxide-based sunscreens are favoured because they block some visible light in addition to UV rays. Iron oxide is a component of all tinted cosmetic products (creams/powders).
- Use a gentle cleanser and a fragrance-free moisturizer if the skin is dry.
- Makeup is a wonderful tool for camouflaging the pigment. Concealer makeup can be used as a thicker, more opaque foundation. To lessen pigmentation, use colour correctors.
- If it's okay, think about stopping hormonal contraception.

Melasma has been shown to significantly improve with the use of hydroquinone 2-5% as a cream or lotion, applied at night for 2-4 months.[26] Prior to chemical peels or laser therapy, topical therapies such as azelaic acid, kojic acid, and tranexamic acid should be examined because they have been demonstrated to greatly diminish melasma.[26] Kligman's mixture, which combines hydroquinone, tretinoin, and dexamethasone in a cream base, has proven to be the most effective formulation.[11]

This is still regarded as the gold standard in the treatment of melasma because it has been shown to ameliorate or clear the condition in up to 60 to 80% of those treated.[25]

To effectively treat melasma and reduce relapse, broad-spectrum sunscreen and the use of a helmet should be added to the treatment plan. Before beginning treatment, the treating doctor must make sure there are no obstacles to using sunscreen, such as irritability or issues with sunscreen acceptability. Given its low cost and simplicity of prescription in general practice, oral tranexamic acid is also being utilized more widely. Adult melasma was successfully treated with oral tranexamic acid, according to a recent meta-analysis of randomised controlled trials.[27]

Before prescribing oral tranexamic acid, doctors should educate both themselves and the patient about dosage, side effects, and precautions. The effectiveness of topical usage has not been fully established.

Procedural techniques used to treat melasma

The idea behind melasma treatment is to target the afflicted skin while sparing the healthy, unaffected skin from harm. Unfortunately, it is challenging to protect normally pigmented skin while addressing melasma, and treatment frequently leads to post-inflammatory hyperpigmentation. Chemical peels and laser treatments need to be used carefully because they could make melasma worse or trigger a relapse.[18] These procedures should be carried out by a professional who is familiar with people with darker skin.

Beta hydroxy acids (BHAs), such as salicylic acid, and alpha hydroxy acids (AHAs), such as 6-12% glycolic acid creams/lotions, have also been shown to be effective in the treatment of melasma because they can remove surface skin and reduce tyrosinase's physiological activity.[28] To demonstrate benefit, a series of 3-6 peels may be necessary. AHA and BHA peels can also be used to "spot peel" specific hyperpigmented areas and to lessen the contrast between melanotic macules and healthy skin.[28]

IPL (intense pulsed light) devices emit a variety of various wavelengths that simultaneously penetrate both dermal and epidermal melanomas.[29] The most effective course of treatment includes topical medications. If used without rigorous topical therapy, IPL therapy has a moderate recurrence rate but only produces small improvements. Picosecond lasers, ablative and non-ablative fractionated resurfacing lasers, and Q-switched lasers (neodymium-doped yttrium aluminium garnet) can also be used for selective columns of microthermal damage. These lasers have been found to lessen scarring and epidermal injury but can also result in hyperpigmentation.[18,29]

In general, laser treatment has a higher risk for recurrence and danger for the ailment becoming more resistant to treatment when compared to medicinal treatment techniques.[10] Some procedures should only be carried out by specialists since they carry a higher risk of post-inflammatory hyper- or hypopigmentation.

The process of photoaging, vascular alterations, and the ensuing inflammatory mediators all contribute to pigmentation.[20] The need for combination therapy that addresses photoaging, light protection, and melanin pigment is due to the fact that treating hyperpigmentation alone will not produce long-lasting results.

Results take time, necessitating several sessions and continuing upkeep. If the illness is addressed early in the course of its development, the prognosis is better. Melasma may return even after obtaining proper treatment if exposed to the summer heat (especially in Australia) or due to adjustments in hormonal or physiological variables.[18] Therefore, it is best for patients to receive counseling understanding the chronic nature of the ailment in order to set and meet realistic treatment objectives.

OBJECTIVES

The objectives of present study are

1) To describe the prescription pattern in patients with Melasma

2) To evaluate the medication adherence in patients with Melasma.

MATERIALS AND METHODS

STUDY DESIGN

A hospital - based descriptive observational study.

STUDY SITE

The study is carried on the out-patient Department of dermatology, ESIC MC- PGIMSR & Model Hospital, Rajajinagar, Bengaluru.

STUDY PERIOD

The study was carried out for a period of 6 months.

SAMPLE SIZE

A total of 70 subjects fulfilling the inclusion and exclusion criteria were included in the study.

The sample size was calculated using the pilot study conducted in ESIC hospital.

The sample size of melasma in patients is calculated using the formula.

No. of days of study (3 months) = 100 days

No of patients visiting the dermatology department = 50 x 100 = 5000 patients

No of Melasma patients visiting dermatology OPD = 2x100 = 200 patients

$$N = \frac{Z^2 \times P(1-P)}{M^2}$$

Where, Z= Z value (1.96), P value = 200/5000 = 0.04, sQ value (1-p) = 0.94 Confidence level – 95% Margin of error – 5%.

$N = (1.96)^2 \times (0.04)\ (1-0.04)/\ (0.05)^2$
$=3.8416 \times 0.0384 / 0.0025$
$= 3.8416 \times 15.36 = 59.00 \sim 60.$

Non response distribution= 15%
For 100 patients - 15
For 60 patients -?
15 x 60/100 = 9
N = 60 + 9 = 68~70.

Approximate sample size was found to be 70 patients.

STUDY POPULATION

The study was conducted in subjects drawn from the out-patient Department of Dermatology, ESIC PGIMSR, Rajajinagar, Bengaluru, who had given informed consent form.

STUDY CRITERIA

Inclusion criteria

1. Subjects presenting with blotchy brownish /greyish patches on the face.
2. Subjects of both genders who are diagnosed with melasma on face
3. Subjects irrespective of age, type of severity, type of melasma and other underlying diseases.

Exclusion criteria

1. Subjects not willing to participate in the study and provide consent.
2. Subjects who cannot comprehend and answer the questions.

SOURCES OF DATA

The data was collected from the OUT-patients of dermatology departments. The different sources of data used were:

- Patient profile form
- Patient medical record
- Patient interview.

STUDY PROCEDURE

This was an observational descriptive study; The study will commence after obtaining approval from Institutional Ethical Committee. subjects for the study were identified by the investigators visiting an out-patient department of dermatology based on the inclusion and exclusion criteria. The subjects were explained about the purpose of the study and the consent was obtained. Relevant data (Subjects demographics, prescription pattern of drugs) were recorded on the data collection form, and the subjects were administered Morisky Medication-Taking Adherence Scale-MMAS (4-item) to obtain relevant data on medication adherence of patients. The data then, obtained was entered in Microsoft Excel Sheet and analyzed appropriately to evaluate drug use measures.

STATISTICAL ANALYSIS

All recorded data were entered using MS Excel software and analyzed using SPSS 22 version 29.0 software for determining the statistical significance. The study analyzed prescription pattern of drugs used for treatment of melasma and adherence of patients towards medication prescribed. The correlation was done using Pearson Chi-Square product correlation coefficient between two different variables (age and medication adherence) and Fishers Exact Test (gender and medication adherence). The results were expressed based on significance of p-value and the association between the variables were expressed if they had direct relationship or inverse relationship between two variables.

RESULTS

This study included a total of 70 patients drawn from the Out-patient Department of dermatology ESIC MC & PGIMSR, Rajajinagar, Bengaluru. The study was conducted for a time period of 3 months, during which a total of 70 patients diagnosed with Melasma were included as per inclusion criteria and had provided the informed consent to participate in the study.

AGE DISTRIBUTION OF PATIENTS

Out of 70 patients, most of them 28 (40%) were from the age group of 36-45 years and the least (1.43%) with only one patient were from the 18-25 age groups.

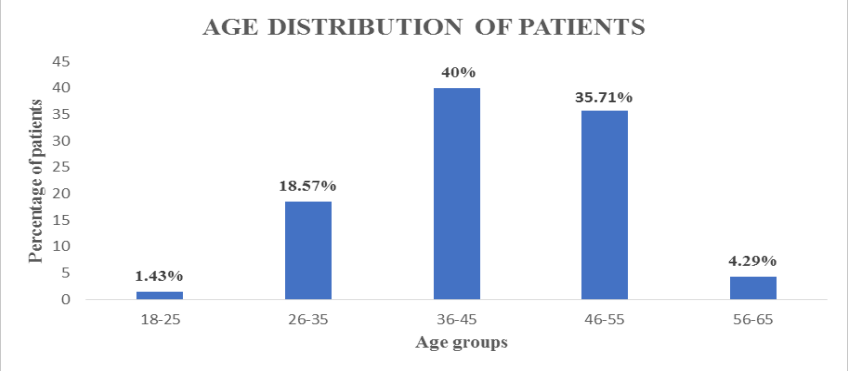

Figure 1: Age distribution of patients.

DISTRIBUTION OF PATIENTS BY GENDER

Out of 70 patients included in the study, the majority of the patients 54 (77.14%) were females. The percentage of males 16(22.86%) included in the study were lesser than the females.

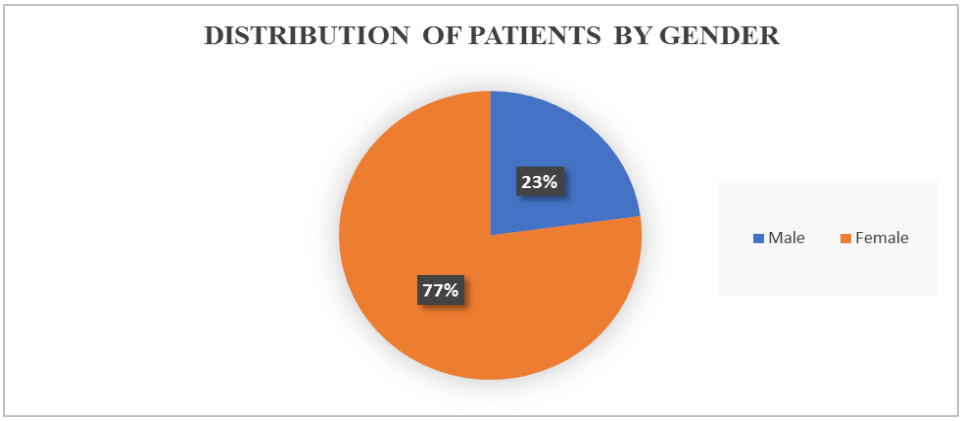

Figure 2: Distribution of patients by gender.

DISTRIBUTION OF CONCOMITANT DERMATOLOGICAL ILLNES

Out of 70 Melasma patients included, 39 patients were found to have concomitant dermatological illness. 14.28% (n=10) of the patients were found to have seborrhea capitis, followed by fissure foot, Acne (n=6, 8.57%), Tinea cruris (n=5, 7.14%), Xerosis cutis (n=4, 5.74%), Fungal infection (n=3, 4.25%), Dermatophytosis, Telogen effluvium, Lichen planus, Melanin hyperpigmentation, Vitiligo (n=1, 1.42%).

Table 1: Distribution of number of concomitant dermatological illness.

Concomitant dermatological illness	No. of patients (n)	Percentage %
Seborrhea capitis	10	26
Fissure foot	6	15
Acne	6	15
Tinea cruris	5	13
Xerosis cutis	4	10
Fungal infection	3	8
Dermatophytosis	1	3
Telogen effluvium	1	3
Lichen planus	1	3
Melanin hyperpigmentation	1	3
Vitiligo	1	3
Total	**39**	**100%**

DISTRIBUTION OF DURATION OF LESIONS

Out of 70 patients included, 44.29% (n=31) Patients found to have less than 1-5 years' duration, 24.29% (n=17) patients 5-10 years' duration, 21.43% (n=15) patients less than 1-year duration, 10% (n=7) patients more than 10 years' duration.

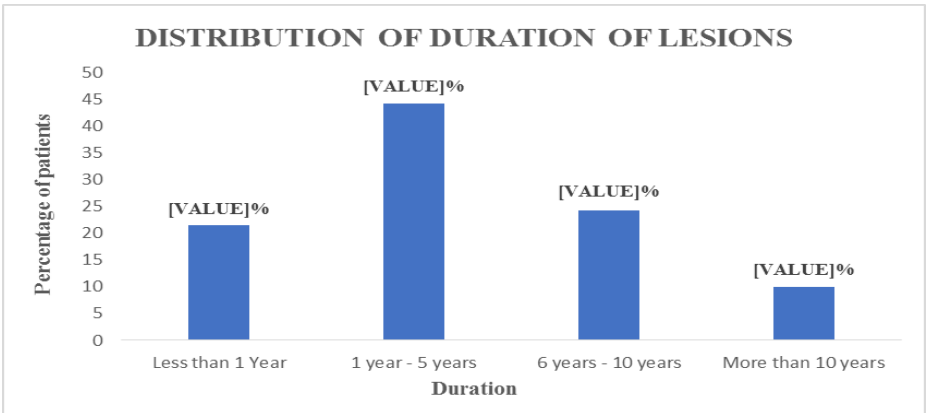

Figure 3: Distribution of duration of lesions.

DISTRIBUTION OF APPROPRIATENESS OF PRESCRIPTIONS

Out of 70 prescriptions included, 70 of the prescriptions were found to have dosage form, frequency of administration (FOA) recorded, followed by 69 of the prescriptions were recorded duration of time (DOT), quantity of drugs, 68 recorded Route of administration (ROA), 40 recorded indications. Appropriateness of the prescription which indicates the good rational prescription habit of the doctors.

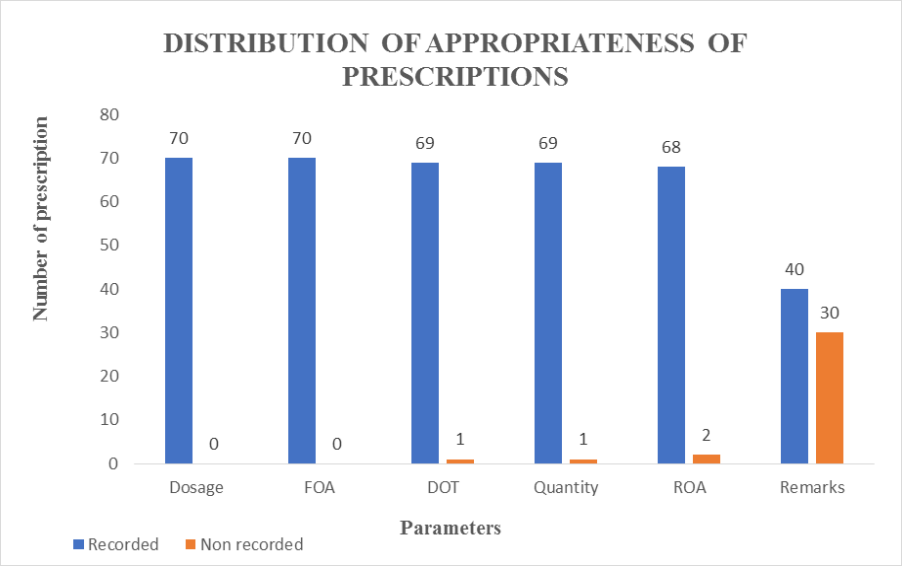

Figure 4: Distribution of parameters recorded and non-recorded.

DISTRIBUTION OF DRUGS PRESCRIBED IN GENERIC NAME

Out of 198 drugs prescribed, (n=102,52%) were in generic name and (n=96,46%) were in brand name.

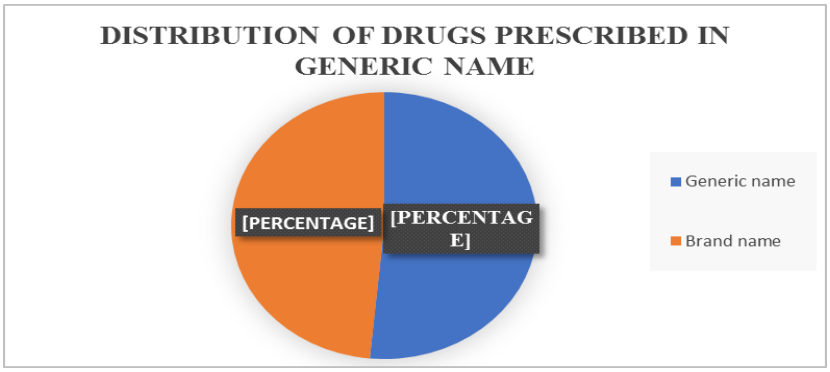

Figure 5: Distribution of drugs prescribed in generic name.

DISTRIBUTION OF CATEGORY OF EACH DRUG PRESCRIBED

Out of 198 medications, Sunscreens (n=51, 25.76%) was found to be prescribed highest followed by Skin lightening agent (n=37,18.69%), Antifungal (n=29,14.65%), Steroids & combination (n=17,8.59%), Keratolytic emollient (n=15,7.58%), Antihistamine (12,6.06%), Corticosteroids (n=11,5.56%), Moisturizing agent (n=9,4.55%), Antibiotic (n=6,3.03%), Multivitamin & mineral (n=4,2.02%), Retinoid (n=3,1.52%), Proton pump inhibitor and Hair growth reductase, Calcineurin- Inhibitor, Vasodilators (n=1,0.51%) were found to be the lowest.

Table 2: Distribution of medicines prescribed based on category.

Category of medicines	Number of medicines (n)	Percentage(%)
Skin lightening agent	37	19
Combination of skin lightening & corticosteroids	17	9
Corticosteroids	11	6
UV Protectant	51	26

Moisturizing agent	9	5
Keratolytic emollient	15	8
Antifungal	29	15
Antihistamine	12	6
Antibiotic	6	3
Proton pump inhibitor	1	0.5
Hair growth reductase	1	0.5
Multivitamin & Minerals	4	2
Calcineurin- Inhibitor	1	0.5
Retinoid	3	1.5
Vasodilators	1	0.5
Total	**198**	**100**

DISTIBUTION OF MEDICATIONS PRESCRIBED:
Out of 198 medications prescribed during the study period, it was identified that 188 (60%) drugs are used for treatment of melasma while 80 (40%) were used as concomitant medicines.

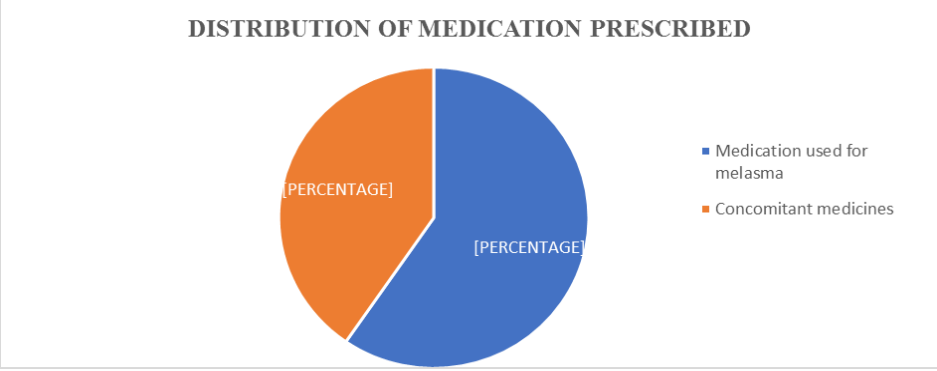

Figure 6: Distribution of medication prescribed.

DISTRBUTION OF MEDICATION PRESCRIBED FOR MELASMA
Out of 118 drugs prescribed for melasma, (n=47,40%) were UV Protectant SPF 30 most prescribed and Tretinion (n=3,2.54%), Desonide (n=3,2.54%) is least prescribed.

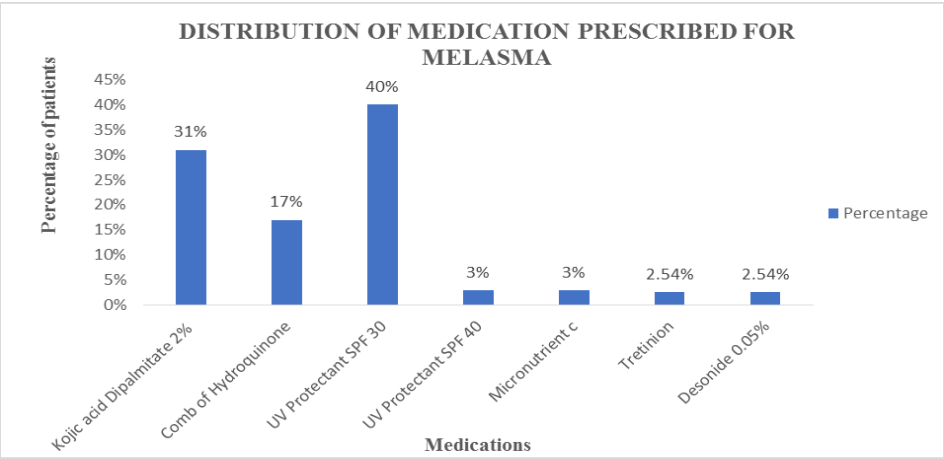

Figure 7: Distribution of medication prescribed for melisma.

DISTRIBUTION OF ROUTE OF ADMINISTRATION
Out of 198 medications, Topical (n=177,89%) was found to be highest route of administration while oral (n=21,11%) were found to be the lowest route of administration.

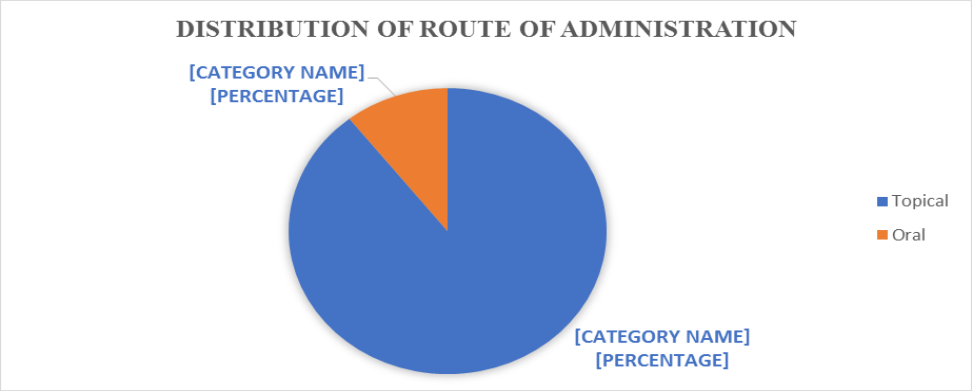

Figure 8: Distribution of route of administration.

DISTRIBUTION OF DOSAGE FORMS

Out of 198 medications, creams (n=68, 34%) was found to be highest prescribed dosage form and Capsule (n=4,2%), Ointment (n=4,2%) were found to be the lowest.

Table 3: Distribution of dosage form.

Dosage form	Number of medicines (n)	Percentage (%)
Cream	68	34
Lotion	58	29
Gel	47	24
Ointment	4	2
Tablet	17	9
Capsule	4	2
Total	**198**	**100**

DISTRIBUTION OF PATIENTS BASED ON MEDICATION ADHERANCE

Patients were administered with Morisky Medication-Taking Adherence Scale-MMAS (4-item). The MMAS consist of four items with a scoring scheme of "YES* =0 and "NO" =1. The items are summed to give a range of scores from 0-4. Mean was calculated after scoring the adherence scale and it was found that the mean is 2 based on which the data was distributed as poor (below 2) adherence and good (above 2) adherence.

Out of 70 patients, (n=41,59%) were good adherence and (n=29,41%) were poor adherence.

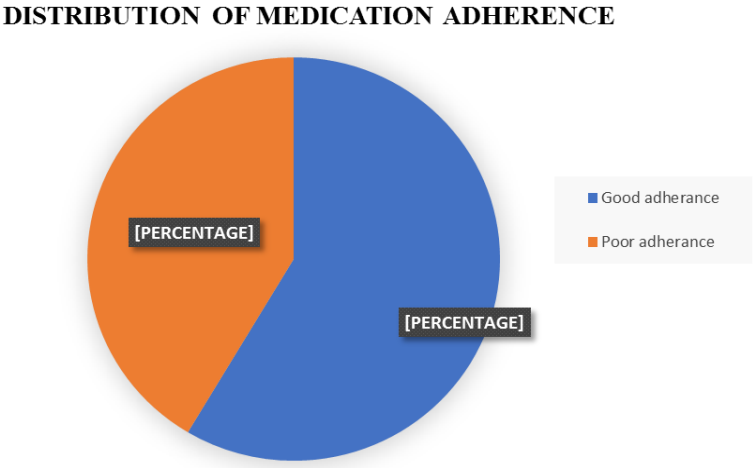

Figure 9: Distribution of medication adherence.

DISTRIBUTION OF PATIENTS WITH GOOD ADHERANCE BASED ON GENDER

Patients with good adherence were distributed based on the gender. It was observed that Out of 41 patients with good Medication adherence, 31 patients i.e. 76% were females and only10 patients i.e. 24%were males.

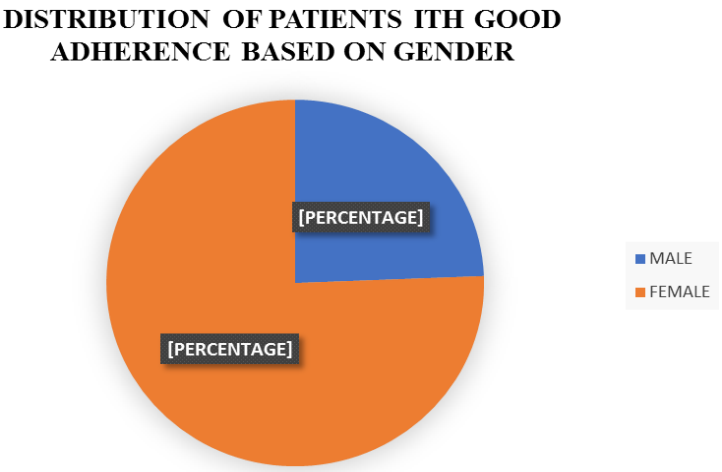

Figure 10: Distribution of patients with good adherence based on gender.

DISTRIBUTION OF PATIENTS WITH POOR ADHERANCE BASED ON GENDER

Out of 29 poor adherance patients, (n=23,79%) were females and (n=6,21%) were males.

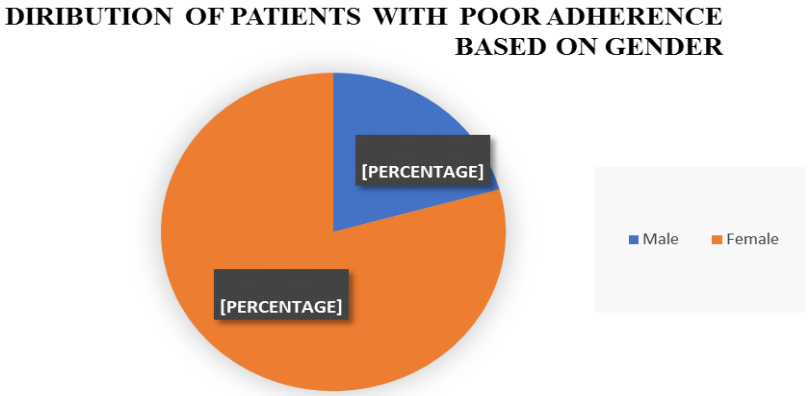

Figure 11: Distribution of patients with poor adherence based on gender.

ASSOCIATION BETWEEN GENDER AND MEDICATION ADHERANCE

The Pearson Chi-Square was used to analyze the association between gender and medication adherence the test showed that there is no significant association between gender and med adherence (p=0.716).

DISTRIBUTION OF AGE AND MEDICATION ADHERENCE

Patients were distributed based on age group and medication adherence as shown in table 16. Among a total of 41 patients with good adherence, patients in the age group of 36-45 was observed to have highest number of patients with good adherence while patients in the age group of 18-25 and 56-65 were found to have least (2%) number of patients with good adherence. Similarly, majority (15%) of patients with poor adherence were found to be in the age group of 46-55 and least (2%) were found in the age group of 26-35 and 56-65.

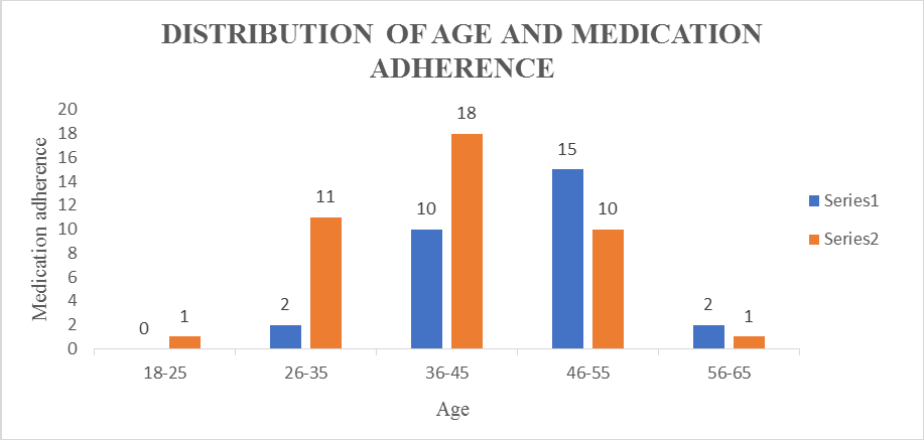

Figure 12: Distribution of age and medication adherence.

ASSOCIATION BETWEEN AGE AND MEDICATION ADHERANCE

Fishers Exact Test was used to find the association between age and medication adherence the test indicated that, there exists a significant association between Age and Medication adherence. Meaning medication adherence is dependent on age of the patient (p= 0.036).

DISCUSSION

The study observed that out of 70 subjects included in the study, the demographic data indicated that 54 of them were female subjects and 16 of them were male subjects. It was found that higher percentage of subjects were females (77%) than males which was (23%). These results were similar to the study conducted by **Binayak C D, Suma D G.**

Among 70 subjects, the age groups (36-45 years) and (46-55 years) was in majority and these two age groups had (25%) subjects. The average age of the study subjects was 42.64 years which was found to be contrary to the study conducted by **Binayak C D** which found that the mean age of patients to be 26.3 years.

In this study, seborrhea capitis was found to be the most common comorbid condition with about 26% of patients suffering from it followed by fissure foot and acne with 15% each subjects. These results were contrary to the study done by **Suma D G which** found that acne vulgaris is most common comorbid condition.

In the present study 44.29%, of patients had onset of duration of lesions between 1 and 5 years and 10%, of patients had onset of duration of lesions more than 10 years, it was found that higher percentage patients had onset of duration of lesions between 1 and 5 years and lower percentage patients had onset of duration of lesions more than 10 years. which is similar to the study conducted by **Suma D G,** where 60%, of patients had higher onset of duration of lesions between 1 and 5 years and 8.3%, of patients had lower onset of duration of lesions more than 10 years.

It is important to choose the right medicines for a patient and in an appropriate manner in order to achieve the best results of medicine therapy. In this study it is heartening to note that more than 95 percentage of medicines, recorded route of administration, dosage, frequency of administration, quantity and duration of treatment. This positive Observation would be a sign of good prescribing patterns in the dermatology outpatient department. It was found that similar study done by **Mohamed S.**

In this study Out of 198 drugs prescribed, 52% were in generic name and 46% were in brand name. These results were contrary to the study done by **Mohamed S** which reports that only 1% of drugs were prescribed by generic name.

In the present study, altogether 198 drugs were prescribed with average of 2.82 drugs per patient. The most commonly prescribed drugs were sunscreen accounting for 26%, similar results were found in a study conducted by **Binayak C D,** the use of broad-spectrum (UVA + UVB) sunscreen is important, as is topical hydroquinone, the most common treatment for melasma. Other lightening agents include kojic acid, arbutin, retinoic acid (tretinoin) and azelaic acid. Combination therapies such as hydroquinone, tretinoin, and corticosteroids have been used in the treatment of melasma, and are thought to increase efficacy as compared with monotherapy. In this study found the most commonly used drugs to be sunscreen lotions.

In this study, out of 198 medications prescribed during the study period, it was identified that 60% drugs are used for treatment of melasma while 40% were used as concomitant medicines.

In the present study, out of 118 drugs prescribed for melasma, 40%were UV Protectant SPF30 most prescribed followed by Kojic acid Dipalmitate2%, Arbutin1.5%, Octinoxate7.5%, Vit E acetate1%, Mulberry extract 1% -gel (n=37), Combination of Hydroquinone 2%, Tretinion 0.05%, Hydrocortisone 1%- ointment (n=20,17%), UV Protectant SPF 40 (n=4), micronutrient & vitamin C (n=4) and Tretinoin cream-Trans Retinoic Acid 0.05% (n=3), and Desonide cream

0.05% (n=3) is least prescribed, similar results were found in a study conducted by **Binayak C D.**

In this study, out of 198 medications, Topical (89%) was found to be highest route of administration while oral (11%) were found to be the lowest route of administration.

In the present study, altogether 198 medications were prescribed in patient with average of 2.82 drugs per patients. The most commonly prescribed dosage form is creams (34%) was found to be highest prescribed dosage form followed by lotions (29%), gel (24%), tablet (9%) and Capsule (2%), Ointment (2%) were found to be the lowest prescribed dosage form, these results were contrary to the study done by **Binayak C D.**

It was observed that Out of 41 patients with good Medication adherence, 31 patients (76%) were females and only10 patients (24%) were males.

The Pearson Chi-Square was used to analyze the association between gender and medication adherence the test showed that there is no significant association between gender and med adherence (p=0.716).

Among a total of 41 patients with good adherence, patients in the age group of 36-45 was observed to have highest number of patients with good adherence while patients in the age group of 18-25 and 56-65 were found to have least (2%) number of patients with good adherence. Similarly, majority (15%) of patients with poor adherence were found to be in the age group of 46-55 and least (2%) were found in the age group of 26-35 and 56-65.

Fishers Exact Test was used to find the association between age and medication adherence the test indicated that, there exists a significant association between Age and Medication adherence. Meaning medication adherence is dependent on age of the patient (p= 0.036).

CONCLUSION

Melasma is a common dermatological condition characterized by brown or grayish-brown patches on the skin, primarily on the face. It predominantly affects women, often triggered or exacerbated by sun exposure, hormonal fluctuations, and genetics. Melasma's exact cause isn't fully understood, but it involves the overproduction of pigment melanin in certain areas of the skin. Its impact on appearance can lead to significant psychological distress. Effective management often involves a combination of sun protection, topical treatments, and in some cases, professional interventions. Understanding melasma's pathogenesis and treatments is crucial in dermatology, given its prevalence and the quest for more effective therapies.

Studying the prescription pattern of melasma is vital for effective treatment. It aids in assessing treatment efficacy and patient safety, allowing for evidence-based medicine and cost-effective care. By understanding which treatments are commonly prescribed, healthcare providers can tailor therapy to individual needs and drive research for innovative solutions. This research helps optimize patient outcomes, enhance safety, and advance the field of dermatology. This study suggests that there is immense scope of improvement in prescribing in this department.

The study of medication adherence in melasma patients is of paramount importance as it directly influences treatment outcomes. Poor adherence to prescribed therapies can undermine the effectiveness of melasma management, resulting in inadequate or delayed improvements. Understanding patient adherence patterns allows healthcare providers to address barriers and tailor treatment plans to enhance compliance. This not only optimizes the chances of successful outcomes but also minimizes the risk of potential side effects from non-compliance. Moreover, it contributes to improving patient education, support, and overall care in the realm of dermatology, ultimately promoting better quality of life for individuals dealing with melasma.

The study concluded the following: the present study analyzed the prescription pattern and medication adherence of melasma patients visiting dermatology department of ESIC MC & PGIMSR Bengaluru. Majority of patients were females and were age group of 36-45 years. Most of the patients presented for treatment within 1-5 years of onset. This delayed presentation may be attributed to the misbelief among patients that melasma is a sign of good fortune and should be left as such. The study reveals that generic prescription is 52%and suggests that effort must be made to encourage multitude of benefits including cost effectiveness. Sunscreens and skin lightening agents were the most commonly prescribed medication. Majority of the patients have good medication adherence and reduced melasma evaluation.

LIST OFABBREVATIONS

ABBREVIATIONS	EXPANSIONS
AHA	Alpha hydroxyl acids
BHAs	Beta hydroxyl acids
HQ	Hydroquinone
IPL	Intense Pulsed Light

MMAS	Morisky Medication-Taking Adherence Scale
SPF	Sun Protection Factor
UV	Ultraviolet
WHO	World Health Organization

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