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**SAINT PAUL'S HOSPITAL MELLINIUM MEDICAL COLLEGE
PUBLIC HEALTH DEPARTMENT**

**MAGNITUDE AND ASSOCIATED RISK FACTORS OF
MELASMA AMONG PATIENTS WHO VISITED
DERMATOLOGY DEPARTMENT AT ALERT CENTER FROM
MAY 1, 2017-OCT 31, 2017.**

**A STUDENT RESEARCH PROPOSAL TO BE SUBMITTED TO THE
PUBLIC HEALTH DEPARTMENT, SPHMMC, IN PARTIAL
FULFILMENT OF THE REQUIRMENTS FOR THE DEGREE OF
DOCTOR OF MEDICINE**

JAN, 2017

ADISS ABABA, ETHIOPIA



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Summary

Background: Melasma is a human melanogenesis dysfunction that results in localized, chronic acquired hypermelanosis of the skin. The exact prevalence and impact of melasma for our country is unknown.

Objective: To assess the magnitude and associated risk factors of melasma among patients who visited ALERT center dermatology department from May 1, 2017 to October 31, 2017.

Methods: Institution based descriptive retrospective study will be used to assess the magnitude and associated risk factors of melasma in ALERT center among patients who visited dermatology department from May1,2017 to October 31,2017. 166 adult patients who are >15 years and have a diagnoses of melasma for the above mentioned time were included in the study. Data was collected by carefully reviewing the medical records of those patients using structured questioners. Data analysis performed using SPSS of windows version 20.

Results: This retrospective chart review study found 166 patients from total of 3519 making the figure to be 4.8%. The study also showed as melasma is more prevalent in women (94%) and most of these patients have completed high school and above (79.5%). The most common identified risk factors were hormonal contraceptives (45.5%), fire wood usage for cooking (20.5%),sun light exposure (16.2%) followed by using cosmetics by personal choice and pregnancy.

Conclusion: Melama is one the commonest skin disorder which patients are in need of dermatologic evaluation as shown in this study. It predominantly affect females who are on their reproductive age. Though it needs collaborations of different sectors for its prevention and creating awareness. Recommendations are forwarded based on the finding of this study.

Acronyms and abbreviation

ALERT=All African Leprosy rehabilitation and training center

COC=combined oral contraceptive

HMIS=Health Management Inpatient service

SPHMMC=Saint Paul's Hospital Millennium Medical College

SPSS= Statistical Package for Social Science.

OPD=outpatient department

USA = United States of America

UV=ultra-violate

WHO= World Health Organization

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1. Introduction

1.1 background

Melasma is a human melanogenesis dysfunction that results in localized, chronic acquired hypermelanosis of the skin. The word melasma originates from the Greek root “melas”, which means black, and refers to its brownish clinical presentation. (1)

Studies on melasma as a disease date back to 1934, which was in England, in which the author describes the case of a 20- year-old woman from London, who presented with brownish, upper lip lesion with well-defined margins and history of worsening after sun exposure. While in 1961, in Los Angeles (USA) melasma was described in detail than the previous one by studying 15 patients between 25 and 43 years of age, who presented with symmetrical hyperpigmentation of the face of unknown etiology. Among the 14 women in the study, ten got pregnant and four reported having “melanosis of pregnancy”. (2)

Melasma has resulted significant impact on the health and daily activities of different people worldwide. It affects all ethnic and population groups though skin type and gender has great role as reports showed its more prevalence among more pigmented phenotypes, such as East Asians (Japanese, Korean and Chinese), Indian, Pakistani, Middle Eastern and Mediterranean-African and female predominance. (5)

The reported prevalence of melasma worldwide ranges from 4.8% among Latino females in the Southern United States to as high as 40% in the South-east Asian population and in India it is the most common pigment disorder which is 41%. However in Africa there are very few studies done on the topic. Studies done in Tunisia in 2010 reported as its prevalence is 4.1% and studies in Morocco reported as the prevalence of melasma range from 4.6%-11.2 %.(5, 14)

Unfortunately there is no published study done in Ethiopia as whole on the topic. Because of this it is difficult to exactly state its impact to our country.

Melasma is cosmetics disorder, the fact that it mainly affects exposed parts of the skin has crucial impact on the quality of their life. As evidenced by studies done in different countries of the world

which most respondents mentioned as they feel great dissatisfaction, low self-esteem, withdrawal from social life, and lower productivity at work or at school.(4)

1.2 Statement of the problem

Melasma continued to be an important cause of morbidity among patients who are visiting dermatology department worldwide.it is the third leading cause of skin disorder worldwide, for which patients are seeking dermatologic evaluation. As stated in different studies its prevalence worldwide ranges from 4.8%-40% and in India as high as 41%. However there are no documented studies in Ethiopia to know exactly how sever the problem is and its impact to our country. (14)

The fact that melasma mainly affects the face, being easily visible and constantly present in everyday life, patients with this disorder are vulnerable to both physical as well as mental health problems. In this context, it has a negative impact on the quality of life of patients, affecting their psychological and emotional well-being, which often motivates them to search for a dermatologist. Patients commonly report feelings of shame low self-esteem, anhedonia, dissatisfaction, and the lack of motivation to go out. Suicidal ideas have also been reported in the literature. (4)

1.3. Significant of the study

It is important to have an understanding of the risk factors and pathophysiology leading to melasma. In addition, knowledge of the varying diagnostic and treatment regimens may lead to improvements in patient care and outcomes. This understanding takes on increased importance as the focus of medicine shifts toward decreasing preventable complications.

Despite a number of studies on skin disorders particularly on melasma worldwide there is no published study done on the topic in Ethiopia in general and the study area in particular. Therefore this study will focus on providing appropriate insights and useful information about the problem. The focus of this study is to gain deeper insight on melasma and factors that aggravate it. The study also would purport good number of benefits; mainly it would bring this untouched, but important area of study in to visibility. It will be an important tool to increase the awareness of the society, the health workers and the government that enable to have better concern and budget in an attempt to prevent it.

2. Literature review

Melasma is a common skin condition characterized by irregular light-brown to dark-brown patches of hypermelanosis on the face. It is one of the commonest skin disorder that affect the cosmetics of patients and significant negative impact on the quality of the patients' life. Its population prevalence varies according to ethnic composition, skin photo type, and intensity of sun exposure. (1)

There are different studies done worldwide and the prevalence of melasma not only vary from country to country but also from regions to region within a country. As evidenced by studies done in Brazil by Brazilian society of dermatology in 2006 from 57,343 patients who were in need of dermatologic consultation melasma was the third largest group of diseases in dermatological practice, accounting for 8.4% of all complaints. This prevalence varied from 5.9% to 9.1% in the different regions of the country. (6)

Again in a 2010 population-based study, 1500 adults from several Brazilian states, pigmentation disorders were reported as the main cause of demand for dermatological care by 23.6% of men and 29.9% of women. (6) An other population-based study in 2013, involving 515 adult employees of the University Campus of Botucatu, Sao Paulo State University, SP (Brazil), melasma was identified in 34% of women and 6% of men. (6)

As different authors stated the reason why melasma is common in Brazil is large miscegenation of the Brazilian population and the rather tropical climate of the country. Taking into consideration the different regions and their ethnic compositions, the authors estimate that 15-35% of adult Brazilian women are affected by melasma. (6)

While study conducted with 2,000 dermatological patients of black origin in Washington, DC, in 2010, revealed that the third most commonly-cited skin disorders were pigmentary problems other than vitiligo. Of these patients, the majority had a diagnosis of post inflammatory hyperpigmentation, followed in frequency by melasma. (11)

Apart from the American continents the topic has been studied in different countries of Asia. As shown by a study conducted in Nepal in 2008 with 546 dermatological patients evidenced melasma

as the fourth most frequent diagnosis and the first most commonly reported pigmentary dermatosis and a retrospective study conducted in Saudi Arabia, which analyzed data from 1076 dermatology patients, also described pigmentary changes as the fourth most common dermatosis. (8)

Similarly, in a population-based survey of 855 Iranian women in the city of Ardebil in 2012, melasma was identified in 39.5% of respondents, and, among them, 9.5% were pregnant women. (9)

However what was found in India among paddy field workers the prevalence of melasma was a bit higher than other Asian countries which has reached 41%. This and the occurrence of melasma in Andean highland children suggest that the combination of pigmentary response (photo type) and intensity of sun exposure plays an important role in the development of the disease. (7)

Not only in Asia study on the prevalence of melasma was also conducted in Europe, France, in 2014 and prevalence of melasma in a group of 601 patients was found to be 5.0%. A possible reason for this discrepancy between the studies could be the difference in skin types. (12)

Although there are very few studies on the topic in Africa, a study conducted in Tunisia in 2010 the prevalence of melasma was 4.1%. At same time it has shown female predominance the disease with ratio of 9.5 to 0.5. while in morocco it prevalence range from 4.6% to 11.2 %. (6, 14)

In Ethiopia because of absence of recorded documents it is difficult to know the disease exact prevalence and its impact to country as a whole and study area in particular.

The exact pathogenesis and cause of melasma not certainly known still. But different studies has confirmed as melasma has numerous aggravating factors including pregnancy, oral contraceptives, genetics, sun exposure, cosmetic use, thyroid dysfunction, and antiepileptic medications.(1)

Melasma associated with pregnancy is very common disturbing cosmetic condition, occurring in up to 75 percent of pregnant women. Pregnancy-induced melasma is associated with an earlier development of the disease and the involvement of a greater number of facial areas. However, it does not correlate with the hyperpigmentation of other areas. (1)

The prevalence of melasma during pregnancy varies greatly among the different countries studied. A cross-sectional study in Southern Brazil identified melasma in 10.7% of 224 pregnant women.

In Iran, melasma was identified in 16% of women; in Morocco, in 37%; and in Pakistan, in 46%. This strengthens the evidence of hormonal involvement in the genesis of the disease, since high levels of estrogen, progesterone and melanocortin are possible triggering factors of melasma during pregnancy. (6)

Almost all studies has shown female predominance which was ranging from 9 or 10 to 1 (estimate range) while in Brazil and Singapore, there was also a clear female predominance: 29:1 and 21:1, respectively. Though an Indian study found a less significant prevalence 7 to 1. (7)

There are few epidemiological data characterizing the disease in men. In a study conducted in Puerto Rico, men accounted for only 10% of cases of melasma and showed the same clinical and histopathological features of the lesions as women. This shows that, although important, female sex hormones might not be an essential causal factor for the development of the disease. (10)

Apart from pregnancy, genetic factor as risk factor for melasma has been evidenced by studies done in USA (North Carolina) in 2009 by comparing two groups of male Mexican workers and a group of male Guatemalan workers (who have a more predominant indigenous ancestry), all residing in North Carolina. The prevalence of melasma was higher in patients over 31 years of age (70%), in the Guatemalan group (36%), and in patients who spoke an indigenous language. This supports the hypothesis that genetic factors influence the development and prevalence of the disease. (13)

Not only in USA other studies in different countries worldwide has shown as genetic factor is directly or indirectly involved as aggravating and risk factor of melasma. a study involving 324 patients in nine centers around the world, it was observed that 48% of individuals with melasma reported family history of at least one relative with this dermatosis and, among those with a positive history, 97% were in first-degree relatives. In Brazil, it was identified 56% of family history among the 302 patients studied. (15)

Conversely, lower frequencies were identified in India (33%), Singapore (10%), and in Tunisia only 2% stated as they have family history of melasma suggesting that the development of the

disease may suffer epigenetic hormonal control, as well as the influence of environmental stimuli, such as UV radiation.

Besides the previously mentioned aggravating and risk factors for melasma sun exposure was also the one as reported by different studies. In India it was the main risk factor identified in 28.8% of respondents among 120 male patients with melasma and in 23.9% of women with melasma. While a study conducted with 197 Patients in Tunisia in 2010 for identifying the aggravating factors of melasma, Sun exposure was cited as the main aggravating factor by 24% of patients. (7, 14)

Combined oral contraceptive (COC) as aggravating factors of melasma was evidenced by different studies in the world i.e.in USA it was reported 19.7% patients used it, in Brazil it was mentioned in 43.7% women with melasma as risk factor, in India it was the risk in 33.4% patients and in Tunisia use of COC was the main risk factors next to pregnancy and sun exposure (48%). (7, 14, 15)

Conceptual frame work of the study

The conceptual framework of the study tries to show factors that are associated with melasma (sociodemographic factors, sun light exposure, pregnancy, drug intake, family history etc. These factors has an effect on excessive melanin production which in turn will have effect in hyperpigmentation of the skin that either will result in melasma development or not.

However this conceptual frame work only tries to show as those factors are related to melasma development or not. It doesn't mention how melasma affect the quality of those patients' life. That will be studied in other studies.

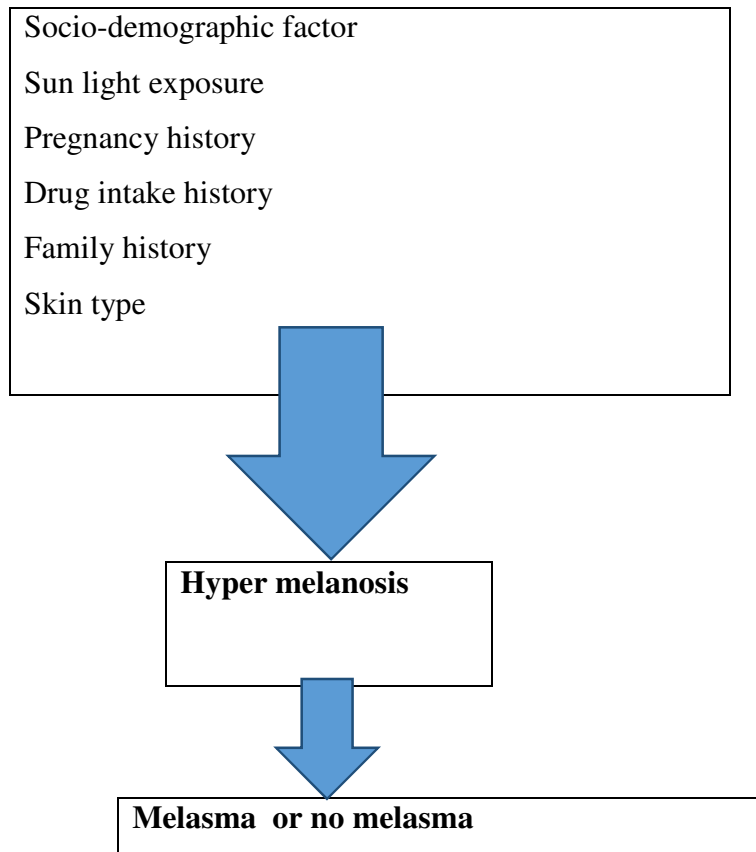


Fig.1 conceptual frame work for melasma development

3. Objectives

3.1. General objective

-To assess the magnitude and associated risk factors of melasma among patients who visited dermatology department at ALERT center from May 1, 2017 to October 31, 2017.

3.2. Specific objectives

-To assess the magnitude of melasma among patients who visited dermatologic OPD at ALERT center from May 1, 2017-october 31, 2017.

-To identify factors associated with melasma among those patients who visited dermatologic OPD at ALERT center from May 1, 2017-October31, 2017.

4. Methods and materials

4.1. Study Area and Period

Ethiopia is a country located in the horn of the sub-Saharan Africa, with an estimated population of 99, 465,819. The capital Addis Ababa is located in the central part of the country, and is the largest, most populated and rapidly expanding city in the country with an estimated population of 3, 384, and 569. (16)

ALERT center was built in 1932 (was named All African Leprosy rehabilitation and training center) by Emperor Haile Selassie in collaboration with the German government, as a focus of rehabilitation of leprosy patients, training leprosy personnel from around the world and leprosy control. Currently name has expanded to include tuberculosis and become All Africa Leprosy, Tuberculosis and Rehabilitation Training center. It currently has 240 beds, with an annual average of 341,000 patients all over the country. Currently the hospital has dermatology, ophthalmology and surgery departments also an orthopedic workshop and a rehabilitation program. Since 2007 it has become teaching institution.

Dermatology department is one of those departments which has five regular OPD where they evaluate and manage on average about 29 new patients daily and at same time teaching of medical students done and the department is on process to start residency program in the coming few months.

The study will be conducted by reviewing charts among patients who visited dermatology department from May 1, 2017-oct 31, 2017.

4.2. Study Design

Institution based descriptive retrospective study will be used to assess the magnitude and associated factors of melasma.

4.3. Source population

All patients who were evaluated and managed in ALERT center of dermatology department from May 1, 2017-oct 31, 2017. According to HMIS of the Hospital 3519 new patients were evaluated and managed for the above mentioned time. These are the source population.

4.4. Study population

Those patients who had melasma are selected by chart review among the source population who fulfil the inclusion criteria are considered as a study population.

4.5 sample size of study

According to the HMIS of ALERT center 187 patients were diagnosed as having melasma for the above mentioned time from 3519 new patients managed at the hospital. From those patients 179 were above 15 years that will fulfil the inclusion criterion so that these were the sample size that were used in the study. However 13 patients charts were some them grossly incomplete and some of the charts were totally lost.

4.6. Eligibility criteria

4.6.1. Inclusion criterion

- All patients who are ≥ 15 yrs and has melasma according to the diagnostic criteria.

4.6.2. Exclusion criteria

-Patients who are < 15 yrs.

-Pigmentary disorders other than melasma i.e. Post inflammatory epidermal melanin hyperpigmentation, melanodermitis toxica.

4.7 Variables

4.7.1 Dependent variable

Melasma cases

4.7.2 Independent variables

Age

Sex

Ethnicity

Religion

Address

Family income

Occupation of patient

Family size
Sun light exposure
Pregnancy history
Drug intake history
Family history
Skin type

4.8. Data collection procedure

The data for magnitude and risk factors associated with melasma was collected using structured questionnaire developed according to the objectives of the study which is adapted from Brazilian dermatologic association, American dermatologic Society and Indian society of dermatology guideline for managing melasma, with modifications to our context. Those questioners had two components i.e. Sociodemographic variables of the patient and associated risk factors for patients with melasma.

The questioners are translated in to Amharic language and pretested in SPHMMC dermatology department OPD patients who were selected randomly after that the data collected by carefully reviewing the patients' course of illness from their respective charts for those patients who were seen in ALERT center of dermatology department from May 1, 2017 –Oct 31, 2017. The data was collected by the investigator and 10 selected clinical year 2 students.

4.9. Pretest (pilot) study

A trial test of the questionnaire was conducted among 10 patients at SPHMMC dermatology OPD. Inconveniences encountered at the pilot study including the suggestions from the participants were used to revise and clarify the questionnaire. The pre-test has helped to revise questionnaire clarity, order of question, and consistency of the data.

4.10. Data analysis

The collected data was cleaned, coded and feed to Epi info new version and inconsistencies and missing values were checked. The analysis of the data that entered, cleaned and coded was done by using the new version of statistical package for social science (SPSS) version 20. Simple

frequencies, tables and bar chart were used to see the overall distribution of the study subject with the variables under study and to determine the associated risk factors of melasma.

4. 11.Ethical consideration

Ethical clearance was obtained from public health department of SPHMMC. Then the concerned officials and department at each level were communicated through formal letter. While data collecting, all methodological and ethical considerations were seriously taken. All information obtained in the course of this study will be treated with confidentiality and will not be used outside the scope of the study.

4.12. Dissemination of the result

This study is partial fulfilment of my 1st degree in medical doctor in SPHMMC. After the research paper gets approved by the advisor, the findings of the study will be submitted to SPHMMC public health department. The findings of this study will be presented in different conferences and seminars whenever possible and it will be published in different journals.

5. Result

5.1. Socio demographics characteristics

Using the data found from the HMIS a total of 3519 patients were evaluated and treated at ALERT center of dermatology department. Among those 3094 were female and 425 were male. The charts of these patients were collected and they were manually assessed to look for those charts with the assessment of melasma. 179 individuals were diagnosed with melasma who fulfill the inclusion criteria. But thirteen of those charts were either grossly incomplete or totally lost as a result not used in this study. A total of 166 individuals were included in the study. Among these patients 156 were female and 10 were male, making them 94 % and 6 % respectively.

The mean (SD) age of the patients was 26.84 (4.9) years. The minimum and maximum age found was 16 and 41 years. 66 (39.8%) of the patients are between 25-29 years.

In regards to ethnicity, 72 (43.4%) are Amhara. 81 (48.8%) of the patients achieved secondary education as maximum educational achievement.

With regard to the occupation of the patients 47 (28.3%) of those patients are government employed. 23.5 % (39) patients were self-employed while 31 (18.4) of those patients were daily laborer and 19 (11.4%) of the patients are merchant. While 15 (9%) of the patients didn't mentioned the occupation of the patient. 66 (39.8%) of the patients are married. 85 (51.2%) of the patients earn more than 2500 ETB per month

Table 1: Sociodemographic distribution of Patients with melasma in ALERT center of dermatology department, dermatology OPD from May 1, 2017 to Oct31, 2017

Variables	Frequency	Percent
Age	15 to 19	9
	20 to 24	48
	25 to 29	66
	30 to 34	29
	35 to 40	13
	Above 40	1
Sex	Male	10
		6

	Female	156	94
Marital Status	Single	60	36.1
	Married	66	39.8
	Divorced	29	17.5
	Widowed	11	6.6
Educational Status	Illiterate	7	9.0
	Can read and write	12	7.2
	Primary	15	9.0
	Secondary	81	48.8
	Higher Edu.	51	30.7
Occupation	Farmer	15	9
	Merchant/Trade	19	11.4
	Gov't Employee	47	28.3
	Daily Laborer	31	18.4
	Self employed	39	23.5
	others	15	9
Monthly Income	Very Low (<500)	14	8.4
	Low (500-1250)	23	13.9
	Average (1250-2500)	44	26.5
	Above Average (>2500)	85	51.2

5.2. Health care utilization of the patients

Sixty five (39.2%) of the patients stayed with the illness for a duration less than 6 months. In regards to reason for visiting a dermatologist, 101 (60.8%) visited for aesthetic reason. 84 (50.6%) visited the dermatologist for the second time.

Table2. Health care utilization of patients with melasma

variables	frequency	percentage
Main reason for seeking medical care		
For aesthetic purpose	101	60.8
Friend's advise	43	25.9
While being evaluated for other health problem	22	13.3
Total duration of illness		
Less than 3 months	40	24.1
Less than 6 months	65	39.2
Less than 1 year	53	31.9
More than 1 year	8	4.8
Number of dermatologist visit for melasma		
First time visit	71	42.8
Second time visit	84	50.6
Third time visit	11	6.6

5.3. Associated risk factors of melasma

Seventy six (45.5%) Patients who developed melasma has used hormonal contraceptives. However which type of hormonal contraceptives they were using was not mentioned in their charts. 34 (20.5%) of those patients use fire wood for cooking. With regard to sun light exposure as risk factor for melasma was seen in 27 (16.2%) of patients. Of course this is also supported in directly as 61.4% those patients never used sun screen and 25.9% rarely use sun screen.12 (7.2%) patients with melasma were cosmetics users and of these 9 (72.2%)of them bought the cosmetics by personal choice. The other risk identified for the patients who developed melasma was pregnancy, 11(6.6 %) of patients were pregnant. From those pregnant women 9 (83.1%) were in 2nd trimester of pregnancy.

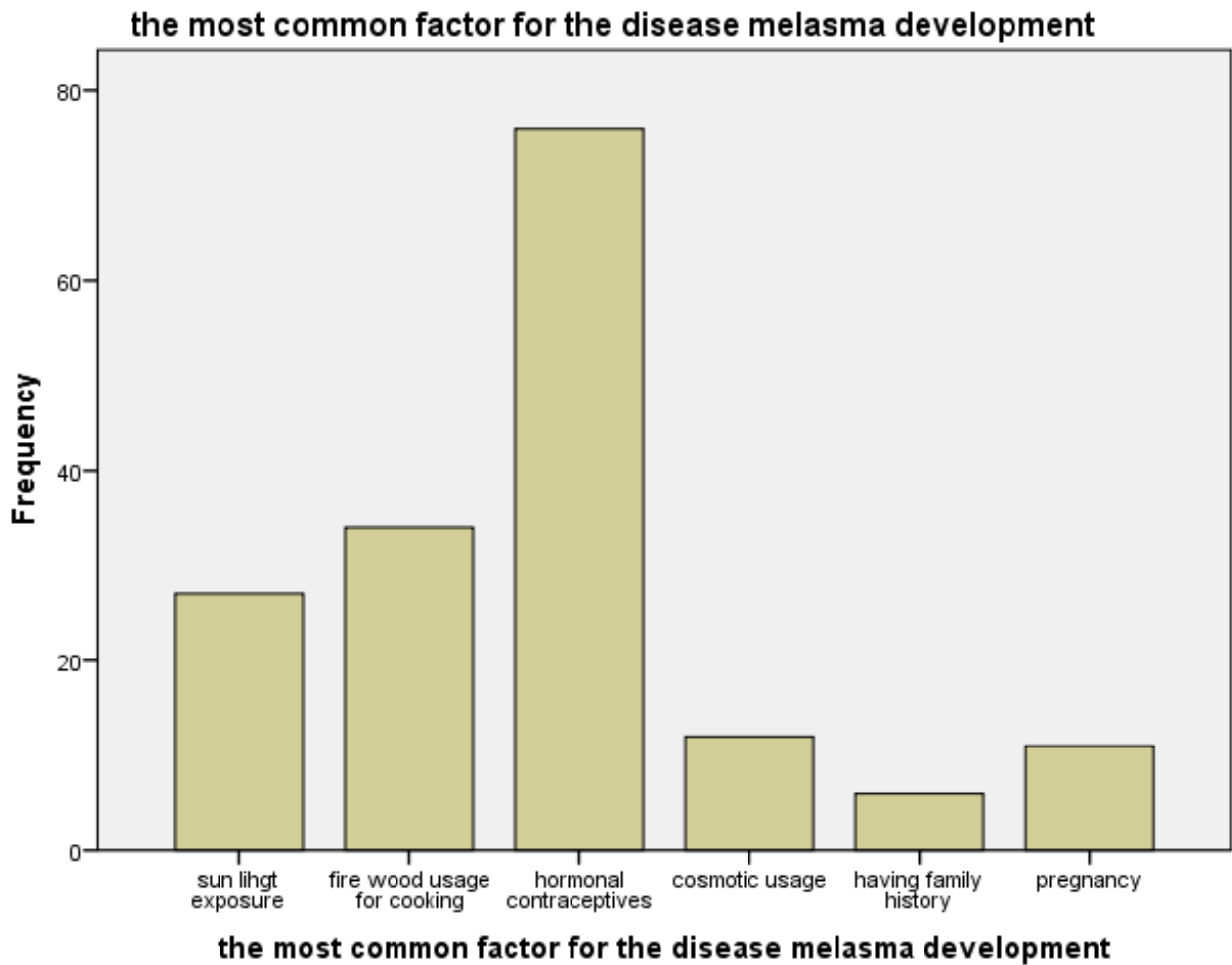


Fig 2. The commonest risk factors identified among patients with melasma in ALERT center of dermatologic OPD from May 1, 2017 to Oct 31, 2017

Table 3. Factors related with melasma

variables	frequency	percentage
Frequency of sun screen usage		
Never	102	61.4
Rarely	43	25.9
Reasons for cosmetics usage		
Personal choice	9	72.2
Health professionals prescription	3	27.8
Trimester of pregnancy at the time of melasma dx		
1 st trimester	2	16.9
2 nd trimester	9	83.1

6. Discussion

This retrospective research found 179 cases of melasma that fulfil the inclusion criteria among the total of 3519 patients seen at ALERT center of dermatologic OPD over a period of six months. However 13 patients chart were either grossly incomplete or totally lost and not used in this study. As result only 166 patients chart is used for this retrospective study.

The magnitude of melasma as seen in ALERT center of dermatologic OPD for the mentioned six months is 4.8 %. This figure is in accordance to studies done in in Morocco which was 4.6 to 11.2% and proximate to studies done in Tunisia and France i.e. 4.1 and 5%. This study is also comparable to the study done in Central America, Guatemala, which is 5%. However the prevalence of melasma in this study is lower than study done in Brazil by Brazilian society of dermatology which is 8.4%. The difference might be attributed due to the study method used which was prospective community based study done over large number of people ,57,343 and the other reason may be the duration of study period which was for two years. Not only in Brazil is this study also significantly lower than study done Andean, India, which is 41%. This much discrepancy might resulted from the fact that the study in India was done among farmers by using cross-sectional study. Different study method and the intensity of sun light exposure has might contributed for this much discrepancy.

The distribution of socio-demographic characteristics of this study among patients who developed melasma has shown female predominance i.e.156 (94%) of all cases in the study. this is similar to different studies done worldwide (in Tunisia 97 % of patients were female, in Brazil and Singapore female to male ratio was 29:1 and 21:1 respectively and in India the ratio of female to male proportion was 7:1).

In this study most of the patients who develop melasma are in the age range of 25-29 years, which makes up 39.8% of the total cases. Followed by those aged ranging from 20-24 years accounting for 28.9% of the total cases. This is in accordance with studies done in Brazil which is in between 25-30years, as well as studies done in Tunisia and India which were in the range of 20-31years old in both countries. The fact that female predominance and those patients being in the reproductive age tell us as hormonal contribution plays role in melasma development.

Most the patients in this study has completed secondary school and above 48.8% and 30.7% respectively. Which will be a total of 79.5% of the total cases. This is comparable to studies done in Brazil which was 81.2% the respondents have completed high school and above. This study has also not significantly different from studies done in India, 78.9% patients has completed high school and above. This doesn't mean the literacy rate in Ethiopia is comparable to that of Brazil and India rather it seems those who are educated are likely to seek medical advice than those who are illiterate.

Factors associated to melasma development in this study mostly are; hormonal contraceptive, Fire wood usage, Sun light exposure, Cosmetics usage and Pregnancy. Almost all of these factors are also demonstrated in researches done worldwide i.e. in Brazil, India, France and Tunisia. These are also among the well-established factors stated in the American Dermatologic Society guidelines.

In this study in most of the patients main risk identified in the development of melasma is using hormonal contraceptives, 76 (45.5%) this nearly comparable to studies done in Tunisia, 48% and studies done in Brazil, which is 43.7%. However compared to what was found in India this figure is a bit higher, 33.4%. this difference might resulted from the fact that the ratio female to male in India was 7:1 in which female proportion was a bit lower than studies done to other countries. Since it is females who use hormonal contraceptives.

The other risk identified was fire wood usage for cooking in 34(20.5%) of the total cases. Comparing this figure to other studies was very difficult. Our economy and electric current distribution really matters.

Twenty seven (16.2%) of the total cases sunlight exposure was the identified risk factor among those patients who developed melasma. This is nearly similar studies done France and Nepal which were 16.9% and 17.4% respectively. While this figure is significantly lower than what was found in India which was 28.8% this discrepancy may be because of the population and study area chosen in India who were farmers and living in semi-desert area.

Pregnancy as a risk factor was identified in this study in 11 (6.6%) of the total cases. This figure is much lower than in almost all studies done worldwide. For example in Pakistan it was 48%, in Iran it was 37%, in USA it was 61%, in India it was 19.3% and in Brazil it was 10.7%. This difference might be because of absence of gynecologic and obstetric care at ALERT center.

7. Strength and limitations

This research is initially started to answer a growing health system problem in Ethiopia. The present study assessed the households' socioeconomic, environmental and behavioral characteristics that are considered to have effects on melasma development. The study also has shown the most important risk factors associated with the diseases to intervene with limited resources for better health. So answering these questions that still exist and that will arise in the future practice and prevention of melasma is of an important clinical and public health issue.

The study has some limitation due to its nature as a retrospective medical record review study. The investigator has no control over the accuracy and completeness of the data since it was primary clinical data, not originally recorded for research purposes but for patient care.

In general the quality of chart keeping and proper documentation of patient information, is an important base for a good retrospective chart review study. In this regard there is a challenge in trying to review some of the charts which are grossly incomplete. Some charts are not physically in a good shape or are not properly documented. Even some charts are entirely missing.

8. Conclusion

Melasma is one of the commonest skin disorder for which patients are in need of dermatologic evaluations, which it was found in 4.8% of total patients who were evaluated at ALERT center of dermatologic OPD. The study showed as melasma predominantly affect females who are on reproductive age. The most common identified risk factors are hormonal contraceptive usage, fire wood usage for cooking, sun light exposure, pregnancy and using cosmetics.

9. Recommendations

As seen in this study at ALERT center of dermatologic OPD melasma is one of the commonest dermatologic issues for which patients look for medical evaluation. Thus it is very important that the communities at ALERT center give adequate emphasis to melasma and to focus on its preventive measures. These problems may be alleviated in the long run, by integrated efforts of different sectors. But for time being, the following recommendations are forwarded based on the findings of the study.

1. Creating awareness regarding the disease melasma to the health care providers and patients
2. Teaching the patients about some preventive mechanism of melasma like;
 - Using non hormonal contraceptive
 - using electric oven for cooking whenever accessible
 - Sun screen usage when the working environment is out door
3. The government should deliver electric current to whole country
4. Further community based study on the topic to identify the possible other factors that are responsible for the disease melasma that will help for proper interventions and to exactly state its prevalence to the community seems necessary.

It will also be very helpful and gives a comprehensive picture of the problem if this study is conducted on other geographic areas of our country and in other Hospitals.

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11. Annex

11.1. Questionnaires

I. Sociodemographic condition of the patient

1. Sex

1, male 2, female

2. Age of patient....

3. Educational status of patient

1 illiterate 2, Can read and write 3, primary school 4, secondary school 5, higher education

4. Occupation of a patient

1, farmer 2, merchant 3, daily laborer 4, government employed 5, self-employed 6, house wife, 7, other (specify)

5. Marital status of a patient

1, single 2, married 3, divorced 4, widowed

6. Monthly family income in Ethiopian birr

1 very low (<500) 2, low (500-1250) 3, average (1250-2500) 4, above average (>2500)

II. Factors related to the illness

7. Duration of illness?

8. Why do you seek medical advice?

1. for aesthetic purpose 2. Advice from a friend 3. While being evaluated for other health problem

9. How frequent you visited dermatology clinic for this issue?

1. First visit 2. Second visit 3. Third visit 4. More than three visits

10. What do you use to cook?

1. Use electrical oven mostly

2. Use fire wood mostly

3. I never cook

11. How often do you use sun screen?

1. Always 2. Sometimes 3. Rarely 4. Never

12. Have you ever used any cosmetics?

1. Yes 2. No

If yes to question 6 answer the following two

13. How frequent?

1. Always 2.Sometimes 3.Rarely

14. How do you get the cosmetics?

1. Based on health professional prescription 2.By personal choice

15. Do you have any relative with malasma?

1. Yes 2.No

For females only

16. Do you get malasma while pregnancy?

1. Yes 2.No

17. If yes at what gestational age?

- 1.First trimester 2.Second trimester 3.Third trimester

18. Have you ever used any hormonal contraceptives?

1. Yes 2.No

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