Clinico-etiological Profile of Melasma among Female Health Workers in a Tertiary Care Center of Central Nepal - A Cross Sectional Study

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ABSTRACT

Background

Melasma is an acquired symmetrical dyschromia with profound psychosocial impacts. It is a common pigmentary disorder with less clear etiology and limited management options. There are limited data regarding melasma in our scenario.

Objective

To evaluate the clinico-etiological profile of melasma, among the female health workers (FHW) in a tertiary health center.

Method

This is a single center, cross-sectional, descriptive study involving female health workers with or without melasma. A total of 198 female health workers were evaluated at Dhulikhel hospital Kathmandu university hospital for clinic-etiological profile of melasma in January 2017. Video-dermatoscopy was used for the clinical diagnosis of melasma. A structured, self-administered questionnaire was used for assessment. Risk factor assessment of etiological agents as sun exposure, hormonal medication, photo aggravating drugs, stressors as night duty were evaluated.

Result

The point prevalence of melasma among female health workers 20.7% (n=41). The mean age of respondents was 26.2 ± 3.23 years with duration of disease process 3.6 ± 2.5 years. Centro-facial pattern was the commonest clinical type (53.7%) and video-dermatoscopy revealed mixed pattern as the commonest (56.1%) pigment deposition pattern. Among 132 female health workers doing night duty on regular basis, 23 had melasma while 66 female health workers not doing night duty, 18 had melasma (p = 0.10). Whereas while comparing hours of night duty per week among respondents with melasma (n=23) and without melasma (n=18) were 23.72±10.08 hours and 17.8±4.77 hours respectively (p=0.02).

Conclusion

The present study reveals higher prevalence of melasma among female health workers having more stressors as night duty.

KEY WORDS

Female, health worker, melasma

INTRODUCTION

Melasma is derived from a Greek word "melas", meaning a "black spot".[1] It is one of the commonest causes of facial melanosis. It is commonly reported among adult women of Fitzpatrick's skin type IV-VI.[2] Melasma tend to occur in three distinct facial patterns; malar, centro-facial, and mandibular but it may also appear on forehead, chin, neck and hands as well.[3] The patterns of melasma based on the primary site of pigment deposition have been described as; epidermal, dermal and mixed.[4]

Disorders of pigmentation are common cause of presentation to dermatologists in Asian scenario.[5] It is the commonest pigmentary disorder in Nepalese setup as well, accounting 32% of the outpatient patients.[6] It is an asymptomatic pigmentary dermatoses having a significant psychosocial impact. There are many theories regarding the etiology of melasma but none have significant proof. Stress may be one of the factors to trigger melasma.

The present study aims to evaluate the epidemiological profile of melasma and its' correlation with stress factors as night duty. This study also aimed to correlate different etiological factors of melasma and treatment compliance or satisfaction.

METHODS

It is a single center, cross-sectional, descriptive study conducted among 217 female healthcare workers working at Dhulikhel hospital Kathmandu University Hospital. Prior ethical consent was taken from institutional review board KUSMS. The sample size was calculated at 217 taking prevalence of 8% in Nepalese population with confidence level at 95% and margin of error at 0.05. The study was conducted in January 2017 after taking consent from the respondent. Among 217 patients, 19 patients didn't submit the self-administered questionnaire, so corrected sample size was 198.

Female health workers working in Dhulikhel hospital for more than 1 year duration of age group 18-55 years were included in this study. Female health workers (FHW) working for less than 1 year, having any other pigmentary dermatoses, pregnancy, recent history of use of any photo aggravating drugs were excluded from this study. Clinical examination and video-dermatoscopic documentation was done for all melasma. Self-administered questionnaire was used as an assessment tool which included epidemiological profile of the respondent, history of the disease process: onset, duration, facial distribution (centro-facial, malar and chin), family history and personal history. Regarding the assessment of etiology; daily sun exposure duration, hormonal medication, photo aggravating drugs, stress factor as night duty, self perceived stress, treatment history and satisfaction with treatment were evaluated.

For continuous variables, arithmetic mean, standard deviation and range were calculated. For categorical variables, frequencies were calculated. The Mann-Whitney test and Chi-square tests were used to evaluate for the statistical significance of differences observed between groups for continuous and categorical variables respectively. A 5% margin of error (p-value < 0.05) was considered to be significant statistically. For all statistical analyses, the Statistical Package for Social Sciences (SPSS) version 16.0 statistical software package (SPSS Inc., Chicago, IL, USA) was used.

RESULTS

The point prevalence of melasma among evaluated FHW was found to be 20.7% (n=41). The mean age of females with melasma was 26.2 ± 3.23 years (Range: 18-55 years) with mean duration of disease process 3.6 ± 2.5 years. Table 1 represents the clinical characteristics and associated factors of FHW having melasma.

Table 1. Clinical characteristics and associated factors of FHW having melasma (n=41).

Clinical Characteristics	Value
Incidence of Melasma	20.4% (N=41)
Mean Age	26.2±3.23 yrs
Mean duration of melasma	3.6±2.5 yrs
Onset during pregnancy	26.8%(N=11)
Family History	43.9%(N=18)
Mean hours of sun exposure	3.1±0.5 hrs
Regular use of Sunscreen	78%(N=32)
Self-perceived stressors	Mild: 69.23%
	Moderate: 30.7%
	Severe: 0
Personal history	Smoking: 14.6% (N=6)
Use of Hormonal contraception	4.8% (N=2)
Facial Distribution of melasma	Centrofacial: 53.7% (N=22)
	Malar: 31.7% (N=13)
	Mandibular: 14.6% (N=6)
Treatment for melasma	56% (N=23)
Treatment Satisfaction	None

Table 2. Video-dermatoscopic analyses of the melasma patients

S N.	Distribution of melasma	Video-dermoscopic findings	Number(%)
1	Epidermal	Reticular pigment network with brownish homogenous pigmentation with sparing of follicular openings	13(31.7%)
2	Dermal	Diffuse dark brown reticular pigmentation	5(12.2 %)
3	Mixed	Both patterns	23(56.1%)

Table 3. Comparison between melasma and night duties

	Melasma -Yes	Melasma - No	P-value
Night duty- Yes	23	109	0.107
Night duty - No	18	48	

Table 4. Comparison between melasma and hours of night duties

	Melasma Yes	Melasma No	P-value
Hours of Night duty/week	23.72±10.08	17.8±4.77	0.02

Out of 41 patients, 26.8% (n=11) respondents reported that their disease precipitated during pregnancy. A positive family history of melasma was observed in 43.9% (n=18) of patients. Respondents taking oral contraceptive pills which resulted the onset of melasma were 4.8% (n=2). Among the respondents, 14.6 % (n=6) had habit of smoking cigarette and 56% (n=23) of FHW had sought medical treatment for management. However none of the respondents were satisfied with the treatment outcome. Respondents with melasma using sunscreen on a regular basis (daily basis) was 78% (n=32).

According to the distribution of pigmentation, three clinical patterns of melasma were observed and among these, the centro-facial type was the most common; seen among 53.7% (n=22) cases. Other types noted were malar 31.7% (n=13) and mandibular 14.6% (n=6), respectively. Table 2 shows the video-dermatoscopic analyses of the melasma patients.

There were a total of 132 respondents performing night duties on regular basis. Among these 132 FHW doing night duty, 23 had melasma while 66 FHW not doing night duty, 18 had melasma (p = 0.10; Table 3). However, while comparing hours of night duty per week among respondents with melasma (n=23) and without melasma (n=18) were 23.72±10.08 hours and 17.8±4.77 hrs respectively (p=0.02; Table 4). The results show a significant association of longer night duty hours with melasma. Among patients with melasma, 69.23% and 30.7% had history of mild and moderate self-perceived stressors respectively.

DISCUSSION

The exact epidemiology of melasma is not known. A community based study conducted in rural Nepal in 2008 with 546 patients revealed melasma as the fourth most frequent diagnosis and the first most commonly reported pigmentary dermatosis.[4] It is also the commonest dermatoses presenting in a hospital setup.[6] The present study has revealed the point prevalence of melasma among FHW to be 20.7%. In Nepal the high prevalence of melasma may be due to high altitude (higher UV index), prolonged sun exposure due to outdoor activity and higher Fitzpatrick's skin type.[5,7] The prevalence is somewhat lower

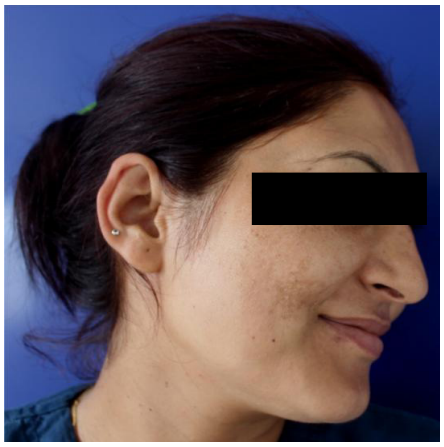

Figure 1. Photograph of a FHW with a mixed variant of melasma

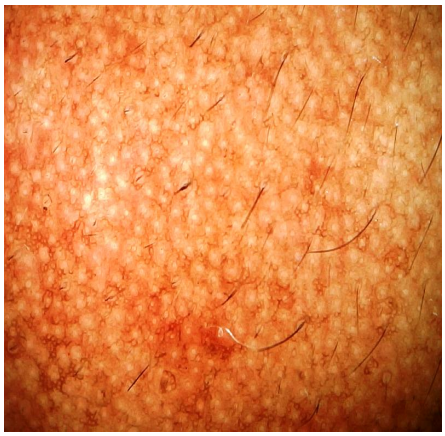

Figure 2. Dermatoscopic appearance of the same patient (figure 1) showing areas of brownish homogenous areas with dark brown reticular pigmentation sparing the follicular openings

than a study of southeast Asia where prevalence of melasma is assumed to be 40% in adult women and 20% in adult men.[8] The mean age of melasma observed in the present study was 26.2±3.23 years; which is similar to a previous hospital based study conducted in India.[9] The present study demonstrated a positive family history of melasma in 46% patients which was similar to study conducted in past with positive family history being positive in 48% of patients.[10]

The etiology of melasma is multifactorial and the pathogenesis is complex. Factors such as skin type, family history, ascendency, sun exposure (UV-A), pregnancy, medication, hormones and stress appear to trigger the onset.[11] Mahmoud et al. studied the impact of ultraviolet A (UV-A) and visible light on melanocompetent skin.[12] This study found that both UV-A and visible light increased pigmentation especially in patients with darker skin type (IV-VI). The hyper pigmented macules resulted due to an increased amount of melanin in the skin, which occurs via two mechanisms: increased melanocytosis or increased melanogenesis. The number of melanocytes is not increased rather they become enlarged and more dendrites appear, indicating a hyper metabolic state. This is reflected by an increased melanin deposition in epidermis and dermis.

Similarly in the present study mean hour of sun exposure was 3.1±0.5 hours per day among respondents with melasma; while the time of sun exposure in patients without melasma was 1.6±0.6 hours. This result can suggest that higher duration of sun exposure could be associated with melasma. Ortonne et al. conducted a large survey in 12 centers of nine countries involving 324 patients to study the impact of UV radiation and hormonal influences in development of melasma.[13] They found that only 20% of patients developed melasma in peri-pregnancy period and weak impact of oral contraceptive pills on the evolution of melasma. This prevalence is similar to the present study which showed 26.8% had onset during peri-pregnancy period and association of hormonal contraception was present in 4.8% of respondents. This result suggests that hormonal alteration could be an adjunctive trigger in the onset of melasma.

Stress has been implicated as a causative factor for melasma. There are reports on onset of melasma after stressful episodes and affective disorders (depression, anxiety or stress).[14,15] Propiomelanocortins (ACTH and MSH) are hormones related to stress.[16] Further, stress can activate hypothalamic pituitary adrenocortical (HPA) axis, leading to increased serum level of glucocorticoids. During stress, corticotropin-releasing hormone (CRH) is synthesized, which further increases pro-opiomelanocortin (POMC) level. POMC is converted into adrenocorticotropic hormone (ACTH) and other melanocortin peptides, like α-MSH. POMC, ACTH, and α-MSH eventually activate melanocortin receptors in melanocytes, inducing melanogenesis.[17]

There are studies performed to correlate stress factors with incidence of melasma but none have established significant correlation. The present study has shown that there is no significant association of melasma with night duty itself. However, the prevalence is higher among FHW performing higher number of night duties. Being a single-center, descriptive study and limited sample size are some of the limitations of the study.

CONCLUSION

This study evaluated the clinico-epidemiological status of melasma on a sample population group. The main findings were disease onset at childbearing age group, high reported frequency of familial disease, higher frequency of medical care and dis-satisfaction with the prevalent treatment. This study has shown correlation between higher night duty hours and mild to moderate self-perceived stressors with incidence of melasma.

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