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EPIDEMIOLOGICAL STUDY OF PERIORBITAL HYPERMELANOSIS

Dermatology

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ABSTRACT

Background: Periorbital hypermelanosis also called dark circles form the major percentage of dermatology consultations. Importance of these disorders is growing as they cause easy visible cosmetic disfigurement and significant psychosocial consequences.
Aims: To assess the patients of POH disorders for demographic, etiological and clinical profile.
Methods: This prospective hospital-based clinical study, conducted in a tertiary medical center over a period of two years, involved 200 patients with POH disorders, assessed using detailed history taking and clinical examination for demographic, etiological and clinical data. Data is statistically described in frequencies (number of cases) and percentages(%) .
Results: Majority of patients were in age group 18-40 years. Females dominated the study with a number of 169 (84.5%) , only 31 (15.5%) were males. Most of the patients belonged to Grade 2 (53%), grade 3 was seen in 27% patients followed by grade 1 (16.5%) and grade 4 (3.5%) POH. Family history was positive in 81.5% patients.
POH was observed mostly in housewives 93 (46.5%) and patients with indoor occupation 69 (34.5%) and less commonly in patients with outdoor occupation 29 (14.5%). Almost all cases of POH gave history of exacerbation following sun exposure.Not a single patient showed hepatic, renal complaints, hypothyroidism or ecchymosis. Majority of patients (86.5%) had altered Sleeping habits. Alcohol and smoking did not have a significant co-relation with POH. It was found that only five percent females on oral contraceptives developed POH and there was no change in Pigmentation of POH in relation to menstrual cycle in any of the females.
Limitations: The quantitative assessment of melanin by specialized instrument (mexameter) could not be done because of lack of resources.

KEYWORDS

INTRODUCTION:

Periorbital hypermelanosis also known as dark circles, periorbital melanosis and idiopathic cutaneous hyperchromia of the orbital region are characterised by bilateral homogenous, hyperchromic macules and patches primarily involving the upper and the lower eyelid but also sometimes extending towards eyebrows, malar region and lateral nasal root also defined as extension of the pigmentary demarcation lines-F of the face[1].

There are various etiological factors like fatigue, stress, aging/photo damage, lifestyle, medications (Oral contraceptive pills, antipsychotics), hormonal, refractive errors, excessive subcutaneous vascularity, shadowing due to skin laxity, genetic[2], secondary to allergic contact dermatitis, atopy, extension of pigmentary demarcation line[1] associated with major or chronic illness. It is difficult to distinguish the etiological factor clinically and would need a careful elimination by history and investigations to label the condition as POH. And so the aim of this study is to evaluate the etiological factors of POH.

Various diagnostic tools have been used for the diagnosis of POH. They include Woods lamp, Dermatoscope[3], SIAscopy, Mexameter[4].

While diligent use of sunscreens, proper nutritional choices and lifestyle and avoidance of environmental triggers may help to decrease the incidence of POH, genetics and normal aging process make it unlikely that POH can be avoided in all patients. Various treatment options like skin lightning agents, chemical peels, Q-Switched ruby laser, Autologous fat transplant, fillers, botox, combination of fat grafting and blepharoplasties are tried and but none has given a satisfactory result[5].

MATERIALS & METHODS:

This was a single centered, cross-sectional descriptive study aimed at studying the etiological factors of POH performed between November 2012 to July 2014 with the approval of the institutional ethical committee.

A total of 200 patients were enrolled for the study according to the inclusion criteria. Detailed history of each patient was taken based on history of chronic illness, occupational history ,sleep habits, reading habits, drug history, family history, refraction errors, menstrual history, stress evaluation based on perceived stress scale according to the pre-set proforma was noted.

Inclusion Criteria:

All patients with POH above the age of 18 were included in the study.

Grading of POH (Done In Comparison To Surrounding Skin):

0 – skin colour comparable to other facial skin areas
1 – faint pigmentation of infraorbital fold (photograph 1)
2 – pigmentation more pronounce (photograph 2)
3 – deep dark colour, all four lids involved (photograph 3)
4–grade 3+ pigmentation spreading beyond infraorbital fold (photograph 4)

Digital photographs of the patient from forehead till the malar area of the face were taken without flash, keeping the place constant with a white background, with written consent.

Statistical Analysis:

Data is statistically described in frequencies (number of cases) and percentages (%) when appropriate. Association between POH and other variables was tested using multinomial logistic regression <0.05 was considered significant. All statistical calculations were done using computer programmes Microsoft Excel 2010 and IBM SPSS (Statistical package for social science) version 20 for Microsoft windows.

RESULTS:

In the present study 200 patients with POH were included. Detailed history and examination along with woods lamp examination and Dermatoscopy examination was done based on the proforma prepared. Most patients were in the age group of 18-40 years. 169 were females (84.5%) and 31 (15.5%) were males shown in Fig 1.

Among 200 patients 93 (46.5%) patients were housewife, 69 (34.5%)

patients had indoor occupation and 29 (14.5%) had outdoor occupation depicted as in Fig 2.

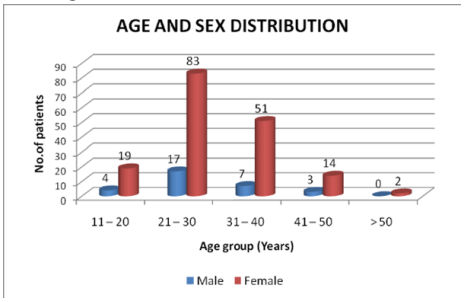


Figure 1

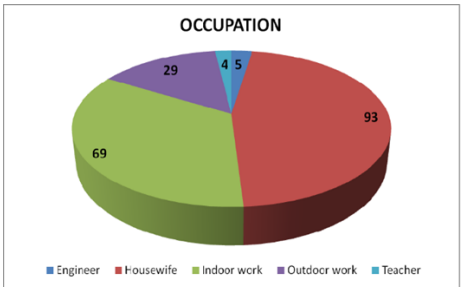


Figure 2:

Out of 200 patients 106 (53%) patients were in grade 2, 54 (27%) patients in grade 3, 33 (16.5%) patients in grade 1 and only 7 (3.5%) patients in grade 4 POH shown in Fig 3.

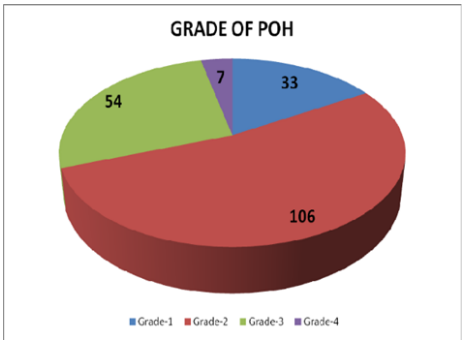


Figure 3:

Only 7(3.5%) patients had diabetes mellitus, 12 (6%) patients had hypertension, 19(9.5%) patients had hyperthyroidism and 155 (77.5%) patients had atopy. Not a single patient showed hepatic, renal complains and hypothyroidism and ecchymosis. Multinominal logistic regression showed good association between POH and atopy, P value being (P-0.045) as in fig 4.

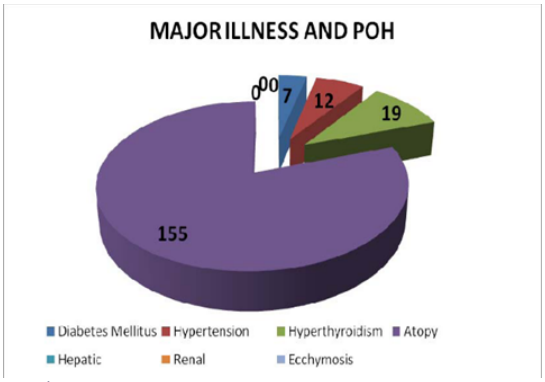


Figure 4:

It was observed that majority of the patients 197 (98.5%) had indirect or direct exposure to sunlight, out of which only 16 (8%) patients were using sunscreen whereas 184 (92%) patients did not use sunscreen at all as shown in Table1.

Sr. No	Use of Sunscreen	No.of Patients	Percentage
1	Yes	16	8
2	No	184	92
Total	-	200	100

Computer work for more than 8 hours per day was observed in 47 (23.5%) patients.

Personal History And POH:

Personal history of the patients were taken regarding sleep patterns, reading, alcohol and smoking and stress levels were evaluated according to perceived stress scale as in figure 5.

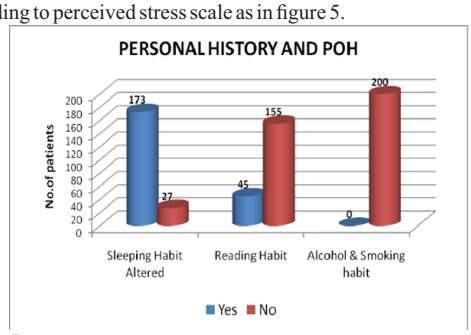


Figure 5:

Sleeping habits were altered in 173 (86.5%) patients and was not altered in 37 (13.5%) patients. Significant P value was observed with sleep lack (P-0.032). Alcohol and smoking didnot have a significant co-relation with POH as in fig7.

Stress evaluation done by perceived stress scale showed majority number of patients i.e. 168 patients having high levels of perceived stress scale. Any value in stress scale above 20 has to be evaluated by a Psychiatrist and is significant. Multinominal logistic regression showed good association between POH and stress P value being (P-0.041).

Out of 169 female patients in the study only 10 (5%) females were using oral contraceptives and reported no significant change in the pigmentation.

There were no patients who presented with allergies to any drug in the periorbital region.

Family history was positive in 163(81.5%) patients and negative in 37(18.5%) patient as in figure 6.

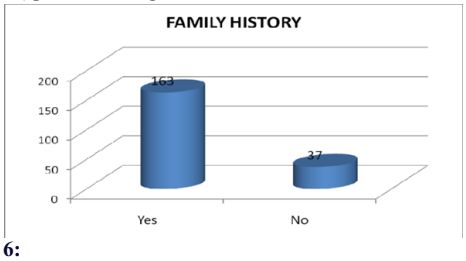


Figure 6:

Multinominal logistic regression showed good association between POH and sleep lack. Significant P value was observed (P-0.002). There was no change in the Pigmentation of POH in relation to menstrual cycle in any of the females.

Out of 200 patients 10 (5%) patients had myopia and 42 (21%) patients had hypermetropia. Multinomial logistic regression showed good association between POH and myopia and hypermetropia P values being (P-0.066), (P-0.049) respectively. Statistically hypermetropia had some significance with POH.

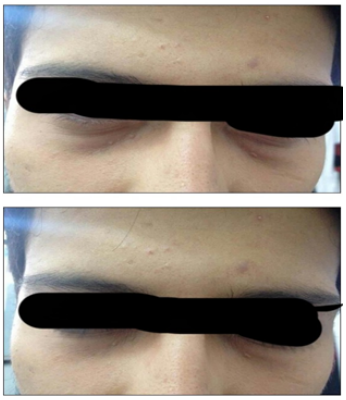
Association of PDL, Allergic rhinitis, Acanthosis nigricans was found to be nil in our patients whereas association of wrinkles were found in 86 (43%) patients. Multinominal logistic regression showed good association between POH and wrinkles P value being (P-0.048).

DISCUSSION:

In the present study 200 patients of POH were included. Each patient

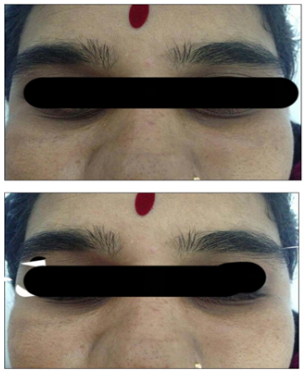
had to undergo dermatoscope and woods lamp examination.

Strachan[6] et al has stated that genetic conditions are not necessarily congenital. The genotype is fixed at conception but the phenotype may not manifest until adult life. In our study occurrence of POH in daughter of a mother having POH was by the age of 16-20 years.



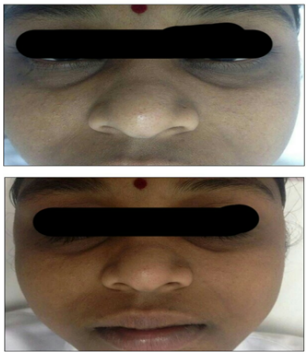
Grade 1 Type of POH

Goodman [7] et al has reported POH to be an autosomal dominant trait which usually runs in the family. In our study 163 (81.5%) patient had positive family history (P-0.002). Whereas in a study done by Verschcore et al on epidemiology and risk factors associated with ICHOR (Idiopathic cutaneous hyperchromia of orbital orgin) observed that there was no significant co-relation between family history and ICHOR. Pratik Seth et al reported 126 (63%) with positive family history.



Grade 2 Type of POH

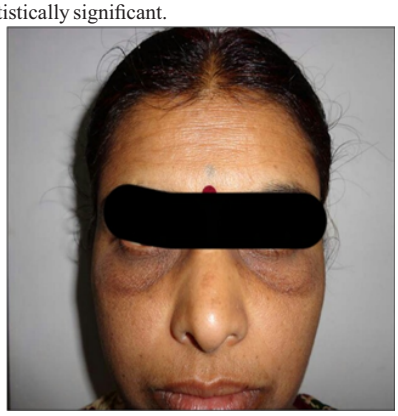
Pratik Seth [8] et al in their study on common causative factors and its association with POH observed that patients of POH with either present or past positive history of systemic disease like diabetes, hypertension, hyperthyroidism, hypothyroidism and seizures constituted only 9%.



Grade 3 Type of POH

In this study patients of POH having presence of past systemic diseases like Diabetes, Hypothyroidism, Hyperthyroidism, Hypertension was not significant.

Usage of sunscreen is very important in all pigmentary disorders and sunscreen play a very important role in controlling hyperpigmentation. Usage of computer, reading, alcohol and smoking in patients of POH was not statistically significant.



Grade 4 Type of POH

Tina Sundelin [9] et al did a study on patients who were deprived of sleep for facial cues and they observed that sleep deprivation can lead to dark circles. In a study by Ranu et al 94(51.1%) and 83(41.5%) patients reported sleep deprivation and insomnia respectively. In our study sleeping habits were altered in majority of patients. We conducted an evaluation of stress based on perceived stress scale and we found that majority of the patients had high levels of stress based on the scale. It is very difficult to say whether stress causes POH or POH causes stress. According to Gathers[10] fatigue, stress, emotional liability and aging all may play a role in development of POH.

Ten percent of the patients were taking OC pills which reflects hormones to be one of the factors involved in causation or exacerbation of POH. According to Gathers [10] chronic use of some drugs including oral contraceptives, hormone replacement therapy, anti- psychotics, gold, chemotherapeutic agents can lead to POH.

Twenty one percent patients had error of refraction i.e. hypermetropia, few had myopia. Majority of patients were not using the spectacles regularly and according to Gathers [10] exhaustion of periorbital muscles may play a significant role in causation of POH.

Association of PDL, acanthosis nigricans and allergic rhinitis with patients having POH was not found to be significant.
Pratik Seth [8] et al observed in their study that 50% patients with POH had anaemia and stated that the POH in these patients may be due to enough oxygen not reaching the periorbital tissue or due to facial pallor which makes the periorbital region looks comparatively darker. Similar findings were also observed in this study.

CONCLUSION:

POH is most common in women than in men. Stress is a very important causative factor in POH . It may be due to effect of increased MSH secretion via HPA axis in response to stress which creates a vicious cycle and it is very difficult to differentiate whether stress increases POH or vice versa but once dark circles appear, it definitely increases stress regarding their aesthetic appearance. Association of wrinkles and POH showed significance Wrinkles can cause shadow effect over the periorbital region leading to visible darkening of periorbital region. Other factors found significant in our study were lack of sleep, error of refraction i.e. hypermetropia, family history, atopy. Association of chronic illness related to hepatic, renal, hypertension, Diabetes mellitus and POH was not significant.

Thus POH being a multifactorial entity it is absolutely essential to determine the cause of POH and there is a need for correction of lifestyle and faulty habits in order to direct the appropriate treatment for better and successful outcome.

Abbreviations:

POH : Periorbital hypermelanosis
DC : Dark circles
PDL : Pigmentary demarcation lines
OPD : Out-patient department
OCPs : Oral contraceptive pills
Pts : Patients

ICHOR : Idiopathic Chronic Hyperchromia of Orbital Region

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