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Original Research Article

Clinico-epidemiological study of facial hyper-melanoses among patients attending dermatology outpatient department at a tertiary care hospital at Pondicherry

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ABSTRACT

Background: Hypermelanoses involving predominantly the face and the neck is relatively common and often presents a complex diagnostic problem. The present study was done in the study population of 500 patients of facial pigmentation, attending the skin outpatient department in AarupadaiVeedu Medical College and Hospital from October 2015 to September 2017. Aim and objective of the study was to study various clinical patterns of facial pigmentation, their clinical characteristics, their association with other pigmentary disorders and to evaluate the different etiotogical and precipitating factors.
Methods: In this study, a special proforma was prepared. Patients were thoroughly interviewed and examined to find out dermatological and systemic diseases and they were subjected to investigations to evaluate different etiological factors and diagnose the clinical type of facial pigmentation.
Results: The present study showed a strong female preponderance. Among the total study population there were 55% cases of melasma, 20% cases of Riehls melanosis, 10% cases of periorbital pigmentation and 5% of miscellaneous causes.
Conclusions: Facial pigmentation was commonly seen in the females. 21-30 years age group was the most commonly affected age group in all types of facial pigmentation. Melasma, Riehls melanosis and periorbital pigmentation were the most common clinical types of facial pigmentation observed.

Keywords: Facial hyperpigmentation, Hypermelanoses, Melasma, Riehls melanosis, Periorbital pigmentation

INTRODUCTION

Man's obsession with skin colour is eternal. While a pale complexioned person craves for a 'healthy tan' a darker one longs for a fairer hue. One has to only look at the sales of suntan lotions and fairness creams to believe this. White or black any blotchy change in skin colour is viewed with dismay and concern. And if such a change were to occur on areas over face, distress and disquiet follows. One such common dermatological disorder of considerable cosmetic importance and causing a lot of emotional disturbance and mental trauma to patient is facial pigmentation.

Hypermelanoses involving predominantly the face and the neck is relatively common and often presents a complex diagnostic problem. Several more or less well-defined clinical syndromes can be recognized, but many transitional forms defy classification. The majority of the world's population is brown-skinned, and an enormous amount of interest worldwide is focused on restoring hyperpigmented skin to its natural color by skin care

specialists.[1] Normal skin color is dependent on the quantity and type of melanin pigment in the melanocytes and keratinocytes. The thickness of the stratum corneum, the dermal vasoconstriction or vasodilatation and the occasional presence of exogenous pigments may also modify the skin color. Several factors may be responsible including hereditary, endocrine, nutritional, neoplastic, inflammatory, drugs, physical and chemical. Due to their visibility, facial and neck pigmentations (cervicofacial pigmentations) are the most cosmetically important.

Facial hyperpigmentation is relatively common and often presents a complex diagnostic problem. Genetic and racial factors are important and endocrine factors, external agents like light, photodynamic chemicals and cosmetics play a major role in facial melanosis.[2]

Objectives

The objective of the study was to study various clinical patterns or facial pigmentation, their clinical characteristics, their association with other pigmentary disorders and to evaluate the different etiotogical and precipitating factors.

METHODS

A special proforma was prepared. Institutional ethical committee clearance was obtained. Patients were thoroughly interviewed and examined to find out dermatological and systemic diseases and they were subjected to investigations to evaluate different etiological factors and diagnose the clinical type of facial pigmentation.

Study type

This study was a descriptive study.

Study population and place

All patients of facial hypermelanoses attending the outpatient department of dermatology in Aarupadai Veedu Medical College, Puducherry.

Period of study

The study was conducted from October 2015 to September 2017.

Inclusion criteria

Patients of all ages who present with facial hyper-melanosis attending skin OPD of AVMC and H.

Exclusion criteria

Those patients who refuse to give consent for the study.

Procedure

Patients to be enrolled in the study were first asked consent to be a part of the study. A questionnaire was used to record the demographic details of all patients including the age of onset, duration of disease, site of onset of pigmentation, rate of progression, associated symptoms, and family history.

Information was also noted regarding any precipitating factors, use of cosmetics, drug intake prior to the onset and associated cutaneous or systemic diseases.

A detailed general physical examination was done. Signs of anaemia and malnutrition were looked for. Local examination of facial pigmentation was done and a record was made of the morphology and distribution of lesions, extent of involvement and color of pigmentation. A detailed systemic examination was also carried out. Woods lamp examination was performed to determine the depth of pigmentation in melasma cases.

The collected data was analysed using Microsoft Excel and presented in number and percentages.

RESULTS

Among the total study population of 500 patients , there were 275 cases (55%) of melasma, 100 cases (20%) of Riehls melanosis, 50 cases (10%) cases of periorbital pigmentation and 15% of miscellenoeus cases which include 25 cases (5%) of post inflammatory hyperpigmentation, 25 cases (5%) of acanthosis nigricans,15 cases (3%) of freckles, 5 cases (1%) of post chikungunya pigmentation and 5 cases (1 %) of Nevus of Ota.

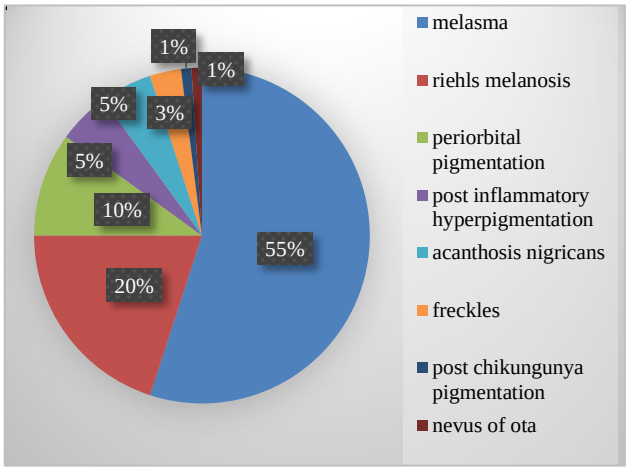


Figure 1: Types of facial pigmentation.

Other types of facial melanosis like Poikiloderma of Civatte, erythrose peribuccale pigmentaire de Brocq, and erythromelanosis follicularis of face and neck, erythema dyschromicum perstans, lichen planus pigmentosus, drug induced facial pigmentation were not observed.

Table 1: Duration of symptoms of facial pigmentation.

Duration	<6 months		6 months-1 year		1-5 years		5-10 years		>10 years	
Disorders	No.	%	No.	%	No.	%	No.	%	No.	%
Melasma	76	27.6	97	35.2	51	18.5	25	9.3	26	9.4
Riehls melanosis	55	55	30	30	15	15	0		0	
Periorbital pigmentation	10	20	15	30	15	30	5	10	5	10
Post inflammatory hyperpigmentation	15	60	5	20	5	20	0		0	
Acanthosis nigricans	5	20	9	36	2	8	7	28	2	8
Freckles	6	40	6	40	3	20	0		0	
Post chikungunya pigmentation	5	100	0		0		0		0	
Nevus of Ota	0		0		0		0		5	100
Total	172	34	162	32	109	21	37	7	33	6

In our study, duration of symptoms ranged from 1-15 years. The onset of pigmentation within 6mnths duration was seen in 34% of cases. 6 months-1 year duration in 32% of cases. 1-5 years duration in 21% of cases. 5-10 years duration in 7% of cases and more than 10 years in 6% of cases. Melasma, periorbital pigmentation and acanthosis nigricans have a wide range of duration of symptoms from 1 month to 15 years.

Majority of the cases (410, 82%) had localized pigmentation. Diffuse pigmentation was observed in only 90 cases (18%).

Melasma

A total of 275 cases of melasma were studied, out of which there were 4% (10 cases) males and 96% (265 cases) females. Male to female ratio was 24:1. Majority of the patients (46%) belonged to 21 to 30 years age group and 36% belonged to 31 to 40 years age group. 9% of cases each were observed in <20 years age group and 41-50 years age group. There were no patients in the age group above 50 years. Female patients were more commonly affected in all age groups. The youngest patient was 12 years old and the oldest patient was 50 years of age.

The commonest skin colour affected was light brown (55%). 15% of fair skin people and 25% of dark brown coloured people were affected by melasma. Only 15 cases (5%) of dark complexion people were affected.

In this study 190 patients (69%) of melasma had malar distribution, 75 patients (27%) had centrofacial distribution. 10 patients (4%) with involvement of the nose only and none showed mandibular pattern.

In 150 patients (54%) the colour of macules was brown and all of them had epidermal type of melasma, as evidenced by woods lamp examination (accentuation of macules). One hundred and fifteen patients (42%) with slate gray coloured macules and 10 patients with black coloured macules did not show accentuation.

Risk factors in melasma includes history of sun exposure (54%), association with pregnancy and menstrual irregulaties (35%), family history (27%), usage of oral contaceptive pills (13%), and thyroid disorders (3.6%).

Riehl's melanosis

A total of 100 cases of Riehl's melanosis were studied, out of which there were 40 males, and 60 females. Male to female ratio was 2:3.

Female patients were more commonly affected in 21 to 30 years age group and males were more affected in 31 to 40 years age group. There were no patients in less than 20 years and greater than 50 years age group. In 63 patients (63%) of Riehl's melanosis, forehead and temples were affected. 23 patients (23%) had involvement of whole face. 14 patients (14%) with forehead and cheek involvement. In 35 patients (35%) the colour of macules was brown, in 30patients (30%) blue black, in remaining 35 patients (35%) black colour.

Risk factors in Rieh'ls melanosis includes usage of the cosmetics (100%), history of sun exposure (57%) and family history (14%).

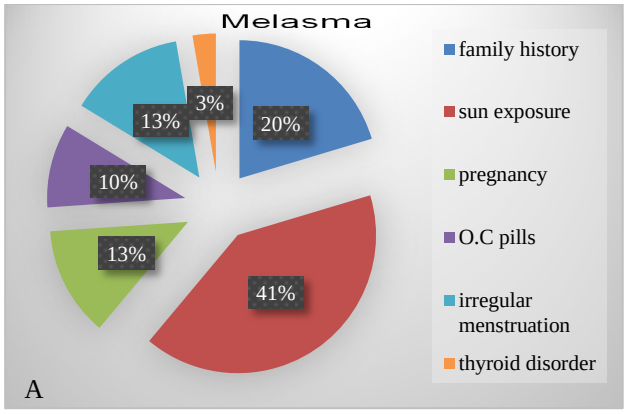
Periorbital pigmentation

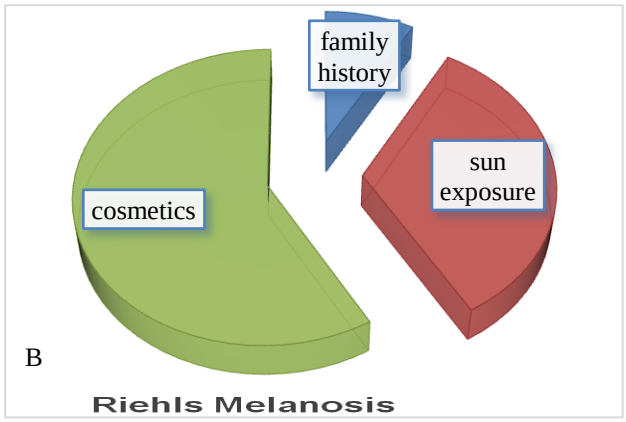
A total of 50 cases of periorbital pigmentation were studied, out of which there were 20 males (40%) and 30 females (60%). 40% patients were in <20 years age group, another 40% in 21-30 years age group and 20% in 30-40 years age group.

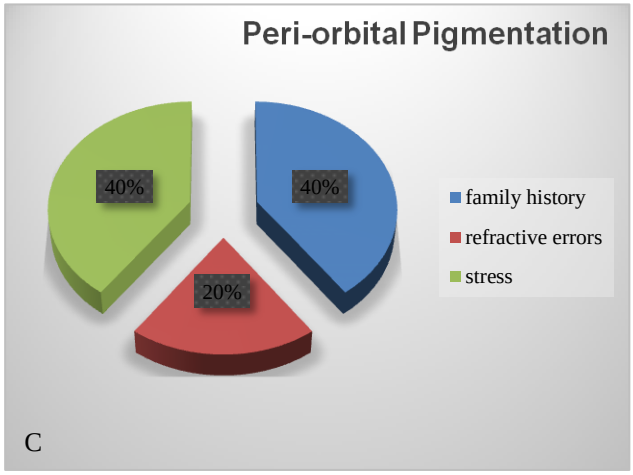
Majority of the patients belonged to puberty and upto 30 years age group. The youngest patient was 15 years old and the eldest was 39 years of age.

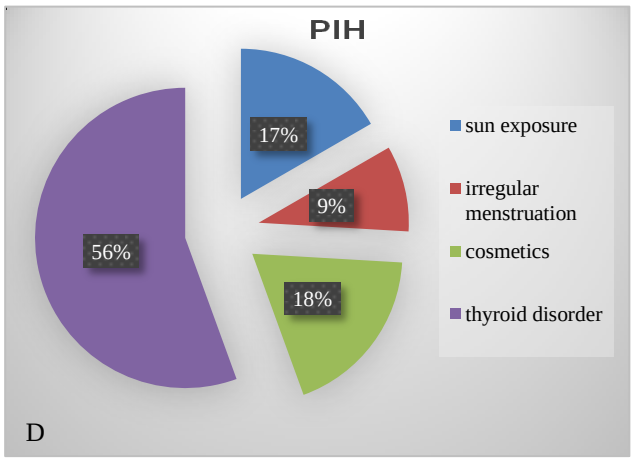
Female patients were more commonly affected in all age groups.

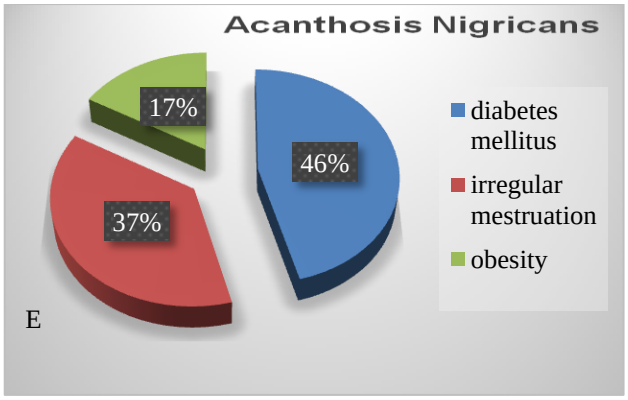
There were no patients in age groups of above 40 years.











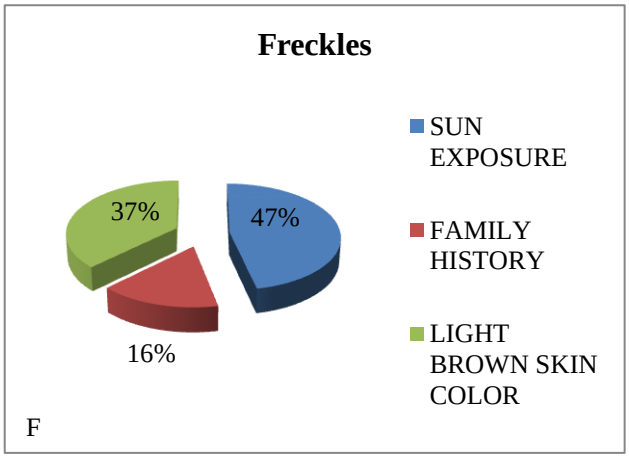


Figure 2: Risk factors for various facial melanoses, (A) melasma, (B) Riehl's melanosis, (C) Peri-orbital pigmentation, (D) PIH, (E) acanthosis Nigricans and (F) freckles.

Male to female ratio was 2:3. 60% of the patients had infra orbital involvement. 40% had involvement of both infraorbital and temple regions. In 40 patients (80%) the colour of macules was dark brown, in 10 patients (20%) black colour.

Risk factors in periorbital pigmentation includes family history (40%), history of refractory errors (20%), stress (40%).

Post inflammatory hyperpigmentation

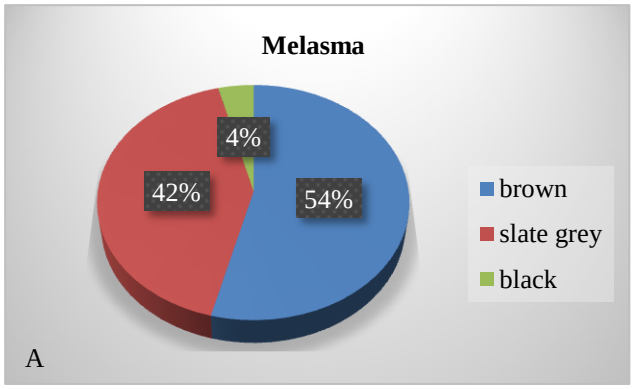
A total of 25 cases of post inflammatory hyperpigmentation were studied, out of which there were 32% males and 68% females. Male to female ratio is 1:2

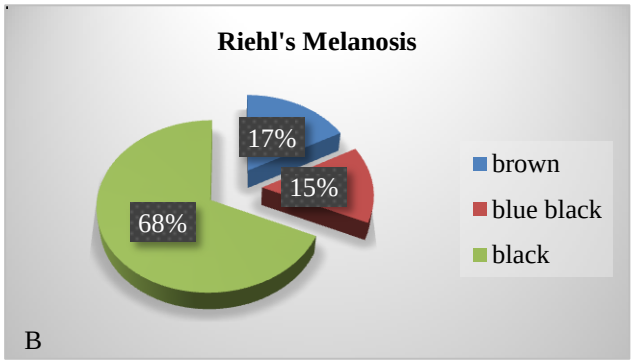
Majority of the patients (52%) belonged to 21 to 30 years age group. 40% belonged to 31-40 years age group. Less than 20 years and 41 to 50 years age group each had 4% of cases. There were no patients in the age group above 50 years.

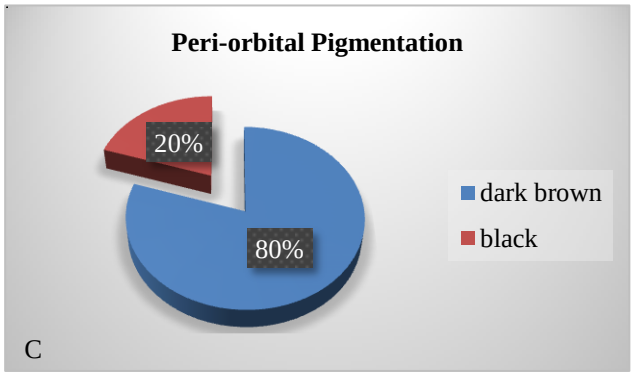
Female patients were more commonly involved in all age groups.

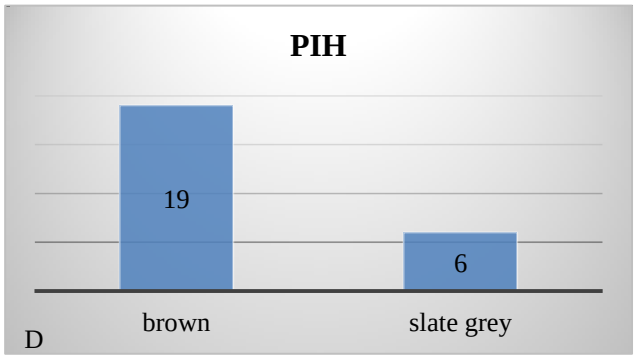
Whole face was affected in 36% of patients, malar area was affected in 36% of patients and 28% of patients had forehead involvement.

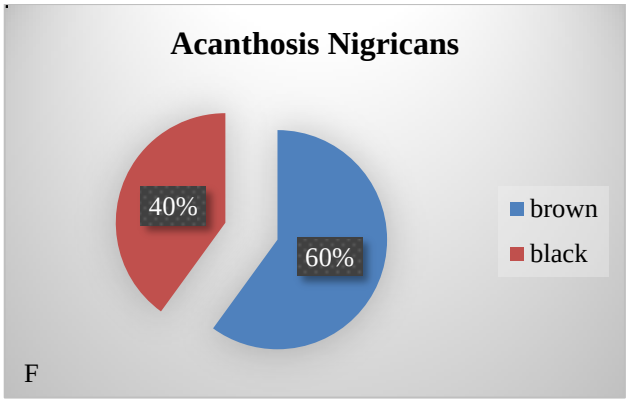
Risk factor includes use of face creams and cosmetics (40%), sun exposure (36%), irregular menstruation (20%) and thyroid disorder (12%).











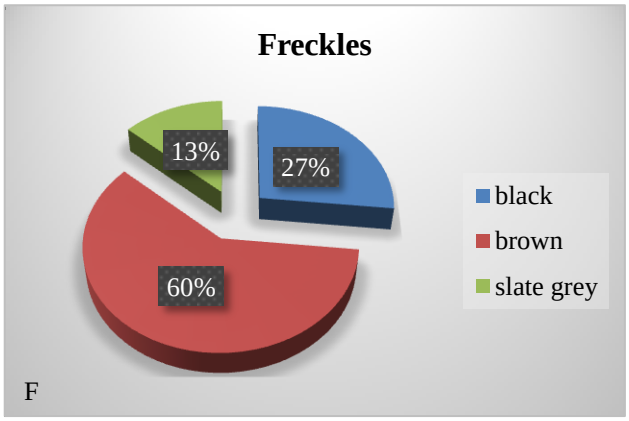


Figure 3: Colour of pigmentation in various facial melanoses, (A) melasma, (B) Riehl's melanosis, (C) Peri-orbital pigmentation, (D) PIH, (E) acanthosis nigricans and (F) freckles.

Acanthosis nigricans

64% of the affected patients (16 cases) were female and 36% of affected patients (9 cases) were male with acanthosis nigricans in our study. Female to male ratio is 2:1. Majority of the cases (48%) belonged to 21 to 30 years age group. 36% belonged to 31-40 years age group. Eight percent of cases were seen in less than 20 years age group and 4% of cases in 41-50 years age group. There were no patients in the age group above 50 years.

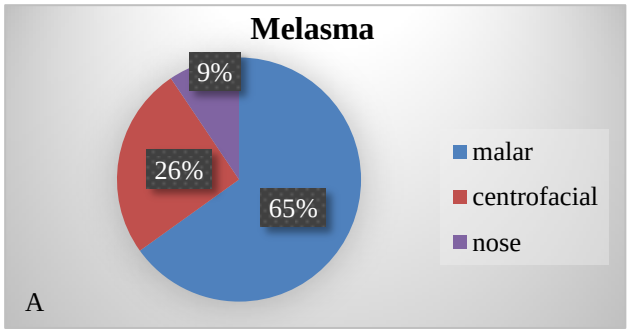
Female patients were more commonly involved in all age groups.

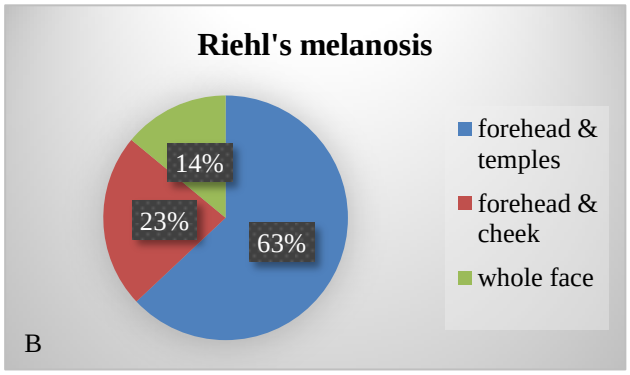
Female patients were more commonly affected in 21-30 years age group and males were more commonly affected in 31-40 years age group. There were no patients in >50 years age group. In 40% of patients of acanthosis nigricans, a malar area were affected and in 16% of patients chin was affected and in 44% of cases forehead was affected. In 60% of cases (15 patients), the colour of the macules was brown and 40% of cases (10 patients) the colour was black.

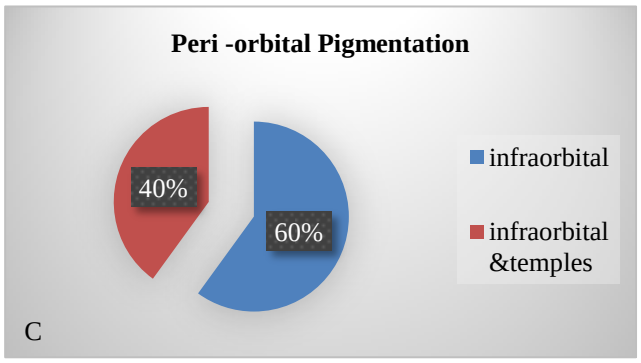
Risk factors include diabetes mellitus (44%), obesity (36%) and irregular menstruation (16%).

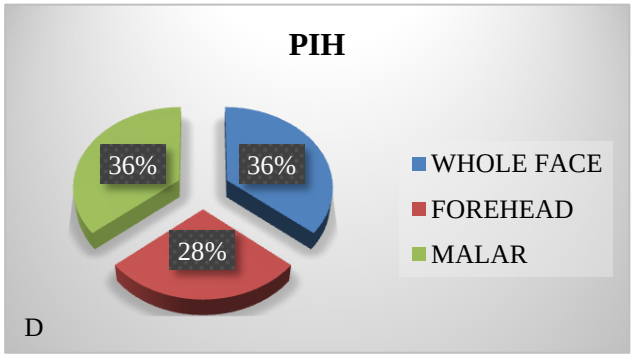
Freckles

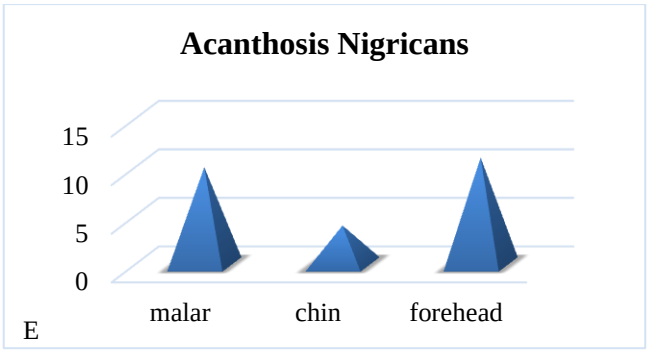
46% of affected patients (7 cases) were female and 54% (8 cases) were male. Female to male ratio is 1:1.17. In 46% of patients malar areas were affected, 34% of patients centrofacial area and in 20% of cases whole face was affected. In 60% of cases (9 patients), the colour of the macules was brown and 27% of cases (4 patients) the colour was black and in 13% of cases (2 patients) the colour was slate grey.











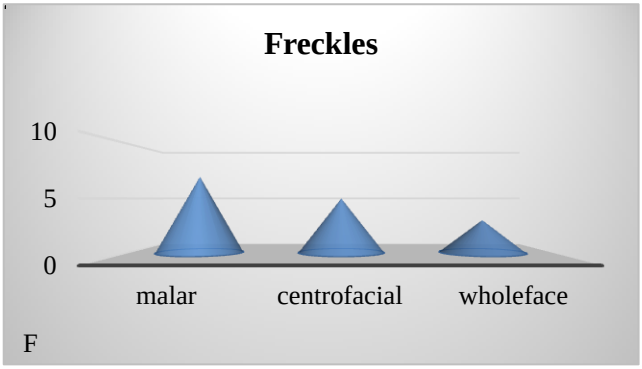


Figure 4: Common sites of pigmentation in various facial melanoses, (A) melasma, (B) Riehl's melanosis, (C) Peri-orbital pigmentation, (D) PIH, (E) acanthosis Nigricans and (F) freckles.

Risk factors include sun exposure (100%), family history (34%), light brown skin colour (80%).

Figure 5: Post chickengunya pigmentation.

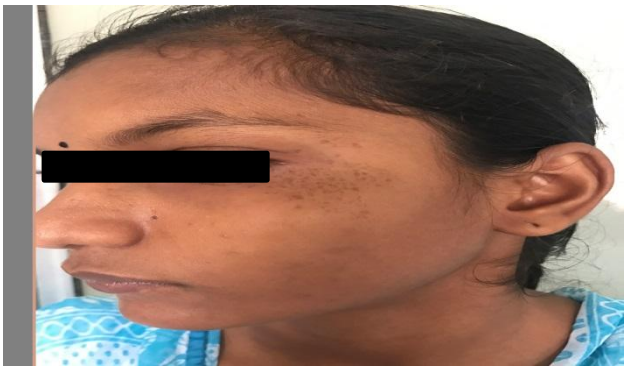


Figure 6: Ephelides over left malar area.

Figure 7: Melasma over malar areas.

Figure 8: Nevus of Ota over the left side of face.

Figure 9: Riehls Mmelanosis involving the whole face.

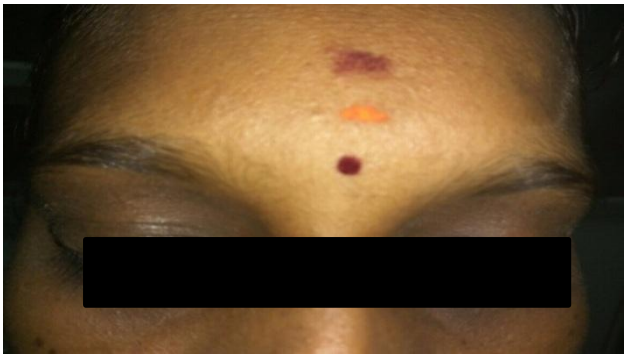


Figure 10: Peri-orbital hyperpigmentation.

Nevus of Ota

Majority of the cases (40% each) belonged to 21 to 30 years and 31-40 years age group. Twenty percent belonged to <20 years age group. There were no patients in the age group 41-50 years and above 50 years. Female patients and male patients were equally involved in all age groups. In all the 5 cases (100%) pigmentation is seen unilaterally over the malar area and pigmentation is brown in colour.

Post chickungunya pigmentation

Majority of the cases (40% each) belonged to <20 years age group and 21 to 30 years age group. Twenty percent belonged to 31-40 years age group. There were no patients in the age group 41-50 years and above 50 years. In 40% of cases, the pigmentation was noted over forehead and in 60% of cases over nose.

In 60% of cases the pigmentation was brown and in 20% slate grey and in the remaining 20% black in colour.

DISCUSSION

Facial hypermelanosis is a common pigmentary disorder and has considerable importance. Five hundred cases of facial pigmentation attending the outpatient department in Aarupadai Veedu Medical College and Hospital were studied.

A detailed history regarding age, sex, occupation, duration, sun exposure, family history, relationship to pregnancy, hormonal therapy, cosmetic use etc, was recorded.

Out of 500 cases studied 55 % patients had melasma, 20% patients had Riehls melanosis and 10% patients had periorbital pigmentation and 15% had pigmentation due to miscellaneous causes.

In the present study average age of onset was 30 years in melasma. Study by Griffith et al have reported an average age onset of 30 years in melasma. The present study corresponds to this.[3]

In melasma patients in this study female to male ratio was 24:1, suggesting female preponderance. Study conducted by Goh et al have reported 21:1 female to male ratio. Our study coincided with the study of Goh et al.[4]

Vanquezet al in a study reported 10% of men were affected with melasma.[5] In the present study the incidence is less in males and only 4% of men were affected.

In a recent study on melasma in men by Murray et al, male melasma involved subtle testicular resistance.[6] However, there was no clinical evidence of testicular dysfunction in any of the male patients in the study.

In the present study positive family history was found in 75 cases i.e., 27% of cases. Candance et al have reported a strong family history of melasma in 47% of cases.[7] In the present study the incidence is lower than the incidence reported by candance et al. Goh et al reported family history of melasma in 10.2% cases.[4]

In this study, melasma was most frequent in those with light brown skin colour compared to dark complexion. One hundred and fifty patients (54%) have given history of excessive sun exposure. A study by Goh et al have reported sun exposure as precipitating factor in 26.8% which is lower than the incidence reported in our study.[4]

In this study 35 patients (12.7%) of melasma gave history of using oral contraceptive pills. Gob et al have reported oral contraceptives as a precipitating factor in 13.1%, which coincides with present study.[4]

An earlier study by Lufti et al reported significant association of thyroid autoimmunity or oral contraceptive pill usage in melasma.[8] In our study, there was a temporal relationship between melasma and hypothyroidism in 10 patients.

Forty five female patients of melasma (16.36%) gave history of onset of melasma during pregnancy particularly during second trimester. Goh et al reported only 12.1% which is lower than the incidence reported in our study.

Fabre et al hypothesised that melanocytes contain receptors for estrogens that show greater sensitivity to circulating estrogens in pregnant state, explaining the predisposition of pregnant patients to melasma.[9] In this study 50 female patients gave history of menstrual irregularities, although there is no clinically evident disease. Perez et al suggested subtle ovarian dysfunction as underlying cause for melasma.[10]

In present study, in 150 cases of melasma (54.5%), the colour of macules was brown and all of them had epidermal type of melasma as supported by Wood's lamp examination which showed accentuation of macules. In 115 cases (41.8%) the colour of macules was slate gray and they were of dermal type as supported by woods lamp examination that showed nil accentuation. In 10 cases (3.6%) colour of macules was black and the melasma was mixed type. Goh et al have reported more than two-third of their cases of epidermal type.[4]

In 190 patients (69%), the melasma was distributed in the malar area. 75 cases (27.3%) had centrofacial distribution of melasma and 10 cases (3.6%) had melasma over the nose only. No cases were observed with mandibular distribution.

Sanchez et al in their study of melasma, reported malar distribution in 73% of black colored patients.[11]

Griffith et al in their study of melasma reported malar distribution in 21% patients of white patients.[3] In present study malar distribution of melasma is common in 69% of patients.

In Riehls melanosis also majority of the patients belonged to 21-30 years of age group with a female preponderance which corresponds with our study.[12]

In this study, in Riehls melanosis majority of the patients belonged to 21-30 year (57%) age group, followed by 31-40 years age group which had 37% of patients. In our study there was a female preponderance in Riehls melanosis and there was no significant family history.

Majority of patients with Riehls melanosis gives history of cosmetic use.[13,14]

In the present study also, all patients (100%) of Riehls melanosis gave history of cosmetic usage, like use of face powders, creams, dyes, Ayurvedic oils, perfumes and after shave lotions.

Serrano et al reported a 27-year-old woman from the United States with dark brown facial pigmentation and ill-defined erythematous patches resulting from the use of a compact face powder containing geraniol and lemon oil. Pigmentation cleared 6 months after use of the face powder was ceased. Geraniol (a well-known sensitizer) in the powder was thought to be the main offending agent. However, it was possible that the pigmentation could have resulted from a phototoxic reaction to the lemon oil.[15]

Hayakawa et al reported sporadic outbreaks and cases from Geraniol in a face powder.[16] There are also reports of sporadic outbreaks due to musk ambrette in incense reported by Serrano et al.[15] Riehls melanosis was reported from usage of azo dyes in a dye factory reported by Nakayama et al.[16,17]

Naganuma et al had demonstrated phototoxicity to lemon oil, which is attributable to bergapten and oxypeucedanin, but none of the lemon oils from various parts of the world were phototoxic at a concentration of 20%. This explains why the International Fragrance Association recommends only 10% lemon oil in fragrance compounds.[18]

Kozuka et al showed the sensitizer in D and C red 31 to be an impurity, phenyl-azo-2-naphthol. Other sensitizers were fragrance materials and, sometimes, bromides.[19]

There was no much association with cosmetic usage in melasma and periorbital pigmentation patients in this study.

Periorbital hyperpigmentation (POH) present with a dark area surrounding the eyelids. It is an ill-defined condition, and the pathogenesis can be multifactorial. In our study, POH constituted 10% of cases of facial hypermelanoses.

Out of 50 cases, 20 (40%) were males and 30 (60%) females. However the study conducted by Ranu et al in Singapore observed male preponderance (62.6%) which was in contrary to our study probably due to geographic and racial differences.[20] In our study, we observed stress in 20 cases (40%) and positive family history of POH in 20 cases (40%) which corresponded with the study of Park et al.[13] Ranu et al in her clinical and epidemiological study of 100 cases of facial hypemelanoses also observed that 51.1% of cases had sleep deprivation with stress but a higher percentage of history of atopy (55.4%) and family history (42.2%).[20] We also noted that 3 (6%) patients had anaemia and 2 (4%) cases had hypothyroidism.

CONCLUSION

Facial hypermelanoses is a clinical feature of a diverse group of disorders in females mostly belonging to middle age who expose to sunlight and have a genetic predisposition. Melasma, Riehls melanosis and periorbital pigmentation were the most common clinical types of facial pigmentation observed. The overall main risk factors are sun exposure, menstrual irregularities, pregnancy and thyroid disorders for melasma, cosmetic usage and sun exposure for Riehls melanosis and stress and family history played a major role in periorbital pigmentation. Diagnosis is mainly clinical based on personal and family history. The treatment is still challenging. It is very important to have a good understanding and information on the clinic-epidemiological and etiological factors responsible for various disorders causing facial hypermelanoses for better management of patients.

Very few studies have been found regarding facial melanoses in South Indian skin and these disorders have variable and overlapping presentations and are associated with significant distress and psychological impact.

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