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Abstract

Background: Hypo-pigmentation disorders are common in paediatric patients. As skin colour is an important visible socio-cultural characteristic of an individual and any deviation from the normal pattern of pigmentation results in hypo-pigmentation. **Materials and Methods:** 60 (sixty) paediatric patients having cutaneous hypo-pigmentation were studied. The investigation included skin biopsy, woods lamp examination, KoH mount, complete hemogram, slit skin smear test. Various types of hypo-pigmented disorders were recorded. **Result:** Out of 60 patients, 13 had pityriasis Alba, 11 vitiligo, 7 leprosy, 6 nervous depigmentation, 4 Tinea versicolor, 3 hypomelanosis of Ito, 3 post-inflammatory hypo-pigmentation, 2 pityriasis rosea, 2 steroid induced hypo-pigmentation, 2 lichen sclerosus atrophicus, 2 PLC, 1 lichen striatus, 1 oculocutaneous albinism, 1 Tuberous sclerotic complex, 1 hypo-pigmentary mosaicism, 1 griscalli syndrome Hypo-pigmented macules with chronic suppurative otitis media and respiratory tract infection was associated with pityriasis alba. Generalised pigmentation with nystagmus, Arterial septal defect, seizures had oculocutaneous Albinism. A hypo-pigmented macule with dental caries was post-inflammatory hypopigmentation. Hypo-pigmented macules with enlarged tonsil and bronchial asthma had psoriasis. Ash leaf macules with seizures had vitiligo. Hypo-pigmentation had microcephaly associated with nervous depigmentosus. Hypomelanosis of Ito had Amblyopia. **Conclusion:** Pityriasis Alba, vitiligo, leprosy, nervous depigmentosus were the major hypopigmentary lesions observed in paediatrics. These lesions reflect congenital defect of growing children hence their cutaneous manifestation must be viewed genetically and embryologically to rule out their aetiologies.

INTRODUCTION

Physiologically human skin presents a unique colour. Skin colour varies from individual to individual, and in an individual, variation in the degree of pigmentation occurs in various regions of the body.^[1,2] Normal skin colour is dependent on haemoglobin (in the oxygenated and reduced state), carotenoids and melanin pigment. Melanin is the major determinant of skin colour, and racial and ethnic differences in skin colour are related to the number, size, shape distribution of melanin-laden organelles called melanosomes.^[3,4] Melanocyte is the sole site of melanin synthesis. Eumelanin and pheomelanin are the two major types of melanin; They impart brown, black and yellow, red colour respectively. Skin pigmentation is classified as constitutive and facultative. The constitutive skin colour refers to the base line genetically determined colour in the absence of sun exposure and other

influences. The facultative (inducible) skin colour is due to pigmentary darkening after secondary melanin production which can result from sun exposure and endocrine causes.^[5,6,7] There are several proposed functions of skin. They include camouflage heat absorption and protection from ultraviolet light. The human pigmentary skin system is a complex set of dynamic cellular interactions that begins during embryogenesis and continues throughout the life of an individual.^[8,9] Hence attempt is made to rule out the disorders of hypo-pigmentation so that it will be a helpful guide to dermatologist to treat such patients.

MATERIALS AND METHODS

60 (sixty) paediatric patients aged between 1 to 14 years attending OPD of skin and VD department of Nimra Institute of Medical Sciences Hospital Ibrahim patnam, Jupidi Andhra Pradesh-521456 were studied.

Inclusive Criteria

Any cutaneous hypo-pigmentary lesions in children below 14 were selected for study.

Exclusive Criteria

Children above 14 years and non-cooperative children were excluded from the study.

Material and Method

A detailed history of the every patient was taken like name, age, onset, nature, and duration of illness, predisposing factors like any skin diseases prolonged illness, family history etc. The investigation included (1) skin biopsy in suspected cases of Hansen's disease, vitiligo, nervous depigmentosis. (2) Woods lamp examination was done in suspected cases of vitiligo, nervous depigmentosus, pityriasis vesicolor (3) KoH mount – The skin scrapings in suspected cases of pityriasis vesicolor was collected directly on the glass microscopic slide held against the scalp. 10% KoH was added and covered by cover slip. Examination was done under low power of a microscope to identify the hyphal forms and spaghetti and meat ball appearance. (4) Compete hemogram was done to rule out any nutritional deficiencies and haematological abnormalities. (5) Slit skin smear was done in suspected cases of Hansen's disease. The duration of study was from June-2016 to July-2021.

Statistical analysis

Different age groups, various findings were classified. The statistical analyses were carried out in SPSS software. The ratio of the male and females was 2:1.

RESULTS

[Table 1] Study of hypo-pigmentation disorders in different age groups –

- Pityriasis alba patients 1 in > 1 year 5 between 1-5 years, 4 between 6-1 year, 3 were between 11-14 years of age, total 13 patients were observed.
- Vitiligo – 2 patients between 1-5 years of age, 3 between 6-10 years, 6 patients between 11-14 years, total 11 patients were noted.
- Leprosy (BT=4 TT=3) – 1 patient between 1-5 years, 2 between 6-10 years, 4 between 11-14 years, total patients were 7
- Nervus depigmentosus – 1 patient was more than 1 year, 1 was between 1-5 years, 3 between 6-10

years, 1 was between 11-14 years, total 6 patients.

- Tinea versicolor – 1 was in more than 1 year, 1 was between 1-5 years, 1 was 6 to 10 years, 1 was between 11-14 years, and total 4 patients were noted.
- Hypo melanosis of Ito - 1 was above 1 year, 1 was between 1 to 5 years, 1 was between 11-14 years, total 3 patients.
- Post – inflammatory hypo-pigmentation 1 was between 1 to 5 years, 1 was 6-10 years, 1 was 11-14 years, total patients were 3.
- Pityriasis rosea – 1 was between 5-10 years, 1 was between 11 to 14 years of age, total 2 patients.
- Steroid induced hypo-pigmentation 1 was above 1 years, 1 was between 1 to 5 years.
- Lichen Sclerosus et atrophicus – 1 was between 6-10 years, 1 was between 11-14 years.
- PLC - 2 were between 6-10 years.
- Lichen striatus – 1 patients between 1 to 5 years.
- Oculo-cutaneous albinism – was 1 between 6-10 years.
- Tuberous sclerosis complex – 1 patient between 6-10 years.
- Hypo-pigmentation mosaicism – 1 was between 6-10 years.
- Griscelli syndrome – 1 patient was between 6-10 years.

[Table 2] Study of systemic involvement in hypo-pigmentation disorders –

- Hypo-pigmentary Nodules in 6-8 months of age with chronic suppurative otitis media having respiratory tract infection was pituitary alba.
- Generalised hypo-pigmentation was between 1-1 ½ of age group had nystagmus with arterial septal defect and seizures had oculo-cutaneous albinism.
- Hypo-pigmented Macules – aged between 7 to 12 years had dental caries post-inflammatory enlarged tonsil, bronchial asthma had hypo-pigmentation (psoriasis).
- Ashy-leaf macules was in 12-13 years patients with seizures had tuberous sclerosis complex.
- Milky-white macules – was in between 8-9 years associated with micro cephalopathy had nervous depigmentosus.
- Hypomelanosis of Ito was aged between 14-15 years with Ambylopia had hypomelanosis of Ito.

Table 1: Study of hypo-pigmentation Disorders in different age groups

Number of children					Total
Disorders	< 1 years	1-5 years	6-10 years	11-14 years	60 (sixty)
Pityriasis alba	1	5	4	3	13
Vitiligo	0	2	3	6	11
Leprosy (BT :4) (TT:3)	0	1	2	4	7
Nervus depigmentosus	1	1	3	1	6
Tenea versicolor	1	1	1	1	4
Hypo melanosis of Ito	1	1	0	1	3
Post-inflammatory hypo-pigmentation	0	1	1	1	3

Pityriasis rosea	0	1	0	1	2
Steroid-induced hypo-pigmentation	1	1	0	0	2
Lichen sclerosus et atrophicus	0	0	1	1	2
PLC	0	0	2	0	2
Lichen striatus	0	1	0	0	1
Oculo cutaneous albinism	0	0	1	0	1
Tuberous sclerosis complex	0	0	1	0	1
Hypo-pigmentary mosaicism	0	0	1	0	1
Griscelli syndrome	0	0	1	0	1

Table 2: Systemic Involvement in hypo-pigmentation disorders

Hypo-pigmentation	Age	Eyes	Ears	Oral	CVS	RS	CNS	Diagnosis
Hypo-pigmented Macules	6-8 months	-	Chronic suppurative otitis media	--	--	Upper Respiratory tract infection	--	Pityriasis alba
Generalised hypo-pigmentation	1-1 ½ years	Nystagmus	--	--	Arterial Septal defect	--	Seizures	Oculo cutaneous Albinism
Hypo-pigmented Macules	7 years	--	--	Dental caries	--	--	--	Post inflammatory Hypopigmentation
	10 years	--	--	Enlarged tonsil	--	Bronchial Asthma	--	Hypo-pigmentation (Psoriasis)
	12 years	--	--	Enlarged tonsil	--	--	--	
Ash leaf Macules	12-13 years	--	--	--	--	--	Seizures	Tuberculosis sclerosis complex
Milky-white Macules	8-9 years	-	-	-	-	-	Seizures	Vitiligo
Hypo-pigmented	5-8 month	--	--	--	--	--	Micro-encephalopathy	Nervus depigmentosus
Hypomelanosis of Ito	14-15 years	Ambyopia	--	--	--	--	--	Hypomelanosis of Ito

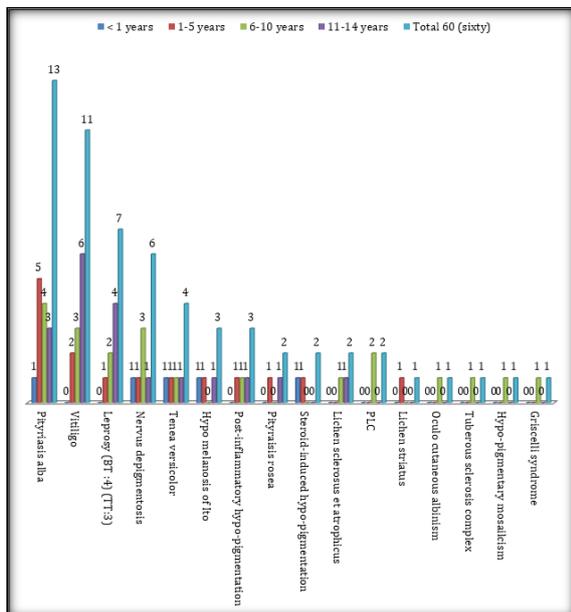


Figure 1: Study of hypo-pigmentation Disorders in different age groups

DISCUSSION

The present study of hypo-pigmented lesions in paediatric patients – 13 had pityriasis alba, 11 had vitiligo, 7 had nervous depigmentosus, 6 had tinea versicolor, 3 had hypo melanosis of Ito, 3 had post-inflammatory hypo-pigmentation, 2 had pityriasis rosea, 2 had steroid induced hypo-pigmentation, 2 had PLC,

1 had lichen striatus, 1 had oculo cutaneous albinism 1 had tuberous sclerosis complex, 1 had hypo-pigmentary mosaicism, 1 had Griselli syndrome [Table 1]. Hypo-pigmented macules with chronic suppurative otitis media, upper respiratory tract infection had pityriasis Alba. Generalised hypo-pigmentation with nystagmus, arterial septation with nystagmas, arterial septal defect, seizures had oculo-cutaneous albinism. Hypo-pigmented macules with dental caries had post-inflammatory hypopigmentation. Hypo-pigmented macules with enlarged tonsil, bronchial asthma had hypo-pigmented psoriasis. Ash-leaf macules with seizures had tuberculosis sclerosis. Milky white macules with seizures had vitiligo. Hypo-pigmented with micro encephalopathy had Nervus depigmentosus. Hypomelanosis of Ito with Ambyopia had hypomelanosis of Ito [Table 2]. These findings are more or less in agreement with previous studies.^[10,11,12]

A variation in skin colour, which occurs due to the differences in the melanin content, is one of the most striking human characteristics. Skin colour plays very important role in enhancing ones physical appearance and attractiveness.^[13,14] Pigmentary disorders in children are little different from those in the adults in terms of aetiology (pigmentary alteration due to genetic disorders are commonly countered in the children) and heightened parental concerns. Because the pigmentary change in children may be seen in the evolution phase of underlying disease, some degree of diagnostic

problems may be encountered and because of inherited nature of some of the pigmentary disorders. The dermatologist may be faced with significant therapeutic challenges.^[15,16]

The prevalence of pigmentary disorders present in children varies depending upon the geographical location of the study population. 64.2% pigmentary disorders were reported in Iran, 30% in USA, 8.6% in south India, 2.6% in north India. Moreover localized area of hypo-pigmentation are frequently developmental or hereditary in origin and appear early in childhood. However pigmented lesion may also be acquired later in childhood.

Post-inflammatory hyper pigmentation is characterised by increase in melanin synthesis following cutaneous inflammation occurring due to physical trauma, friction, primary irritants, lichen SIMPLEX chronicus and DERMATOSES such as pityriasis rosea, fungal infection, bullous dermatoses, and psoriasis fixed drug eruption, photodermatitis and pyoderma.^[17,18] Mosaicism is defined as the existence of two or more genetically of two or more genetically different population of cells originating from one genetically homogeneous zygote. Mosaic skin disease may show different patterns of clinical involvement.

The vast majority of pigment cells are derived from precursor cells in the embryonic neural crest except pigmental layer of retina. Migration of melanoblast from the neural crest to integument has been observed in mammalian embryos hence depigmented lesions are associated with one or more clinical manifestations.^[19]

Melanosomes contain structural matrix proteins and the enzyme tyrosinase which catalyses melanin biosynthetic pathway. Several proteins of unknown structure and function hence it can be hypothesized that well balanced nutritious diet during pregnancy and lactation is essential to maintain the normalcy of integumentary system because most of the depigmented paediatrics is anaemic with congenital defects.^[20]

CONCLUSION

Hypo-pigmentation in paediatric of Andhra Pradesh population they can appear at birth or develop later in life. Pityriasis Alba, vitiligo, leprosy, nervous pigmentosus are predominantly observed. These lesions associated with congenital defect and anaemia. This study demands further genetic, embryological, nutritional, hormonal, environmental studies because exact pathogenesis of hypo-pigmentation is still unclear.

Limitation of study

Owing to tertiary location of present hospital, small number of patients we have limited results.

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