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A Clinical Descriptive Study Of Hypopigmentary Disorders Of Skin.

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ABSTRACT

Hypopigmentation refers to any form of decreased pigmentation whereas depigmentation describes the total loss of pigmentation, resulting in a whitish appearance. These disorders cover a wide range of pathologies including infections, inflammatory disorders, autoimmune diseases, lymphoproliferative disorders, and sclerosing diseases. The intention of this study is to correlate the histopathological findings with clinical findings of hypo-pigmented disorders of skin to arrive at an accurate diagnosis. This study was done as a Prospective study from January 2018 to June 2019 for a period of 18 months. 53 samples were collected from the Department of Dermatology, GMKMCH. The study included patients of pediatric as well as adult age group presenting with one or more hypo pigmented lesions. Both scaly and non-scaly presentations were included. Classical, hypopigmented lesion was selected for biopsy. Immunohistochemistry (IHC) was done for 11 cases selecting one case from each diagnosis using HMB 45 marker. Pityriasis versicolor was the most common disorder showing 12 cases (22.6%), followed by Hansen's disease which were 10 cases (18.9%) and Discoid Lupus Erythematosus, Polymorphous Light Eruptions were the least observed, one case each (1.9%). Of this Pityriasis versicolor showed 83% correlation, PLC showed 66.6% correlation, lichen striatus had 50% correlation and 33.3% correlation in parapsoriasis and 100% correlation in other diagnosis. Immunohistochemistry was done for 11 cases. One case from each diagnosis was selected and HMB45 marker was used to confirm the diagnosis. Based on our study results clinical diagnosis of hypopigmented disorders alone is never specific and cannot be used as a single diagnostic tool for confirmation. Furthermore, Immunohistochemistry helps in differentiating between melanopenic or melanocytopenic and in confirming diagnosis. Hence, a systematic approach of clinical, histopathological examination and Immunohistochemistry will provide an accurate diagnosis of hypopigmented disorders and thereby reducing the patient distress.

Keywords: hypo pigmented. Lesions, skin, HMB45.

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INTRODUCTION

Skin color is a vital and visible sociocultural feature of an individual. The human skin color depends upon the black-brown eumelanin and yellow-red pheomelanin [1]. Other significant contributors include the DNA, urocanic acid, and amino acids [2]. Altered skin pigmentation can result from increased or decreased melanin, abnormal melanin distribution, decreased hemoglobin, or deposition of exogenous substances. Hypopigmentation refers to any form of decreased pigmentation whereas depigmentation describes the total loss of pigmentation, resulting in a whitish appearance. Hypopigmentation and depigmentation have been referenced in many ancient religious texts as a curse. Hypopigmentary disorders in darker skin individuals like Indians can be distressing to the patients and the family. These disorders cover a wide range of pathologies including infections, inflammatory disorders, autoimmune diseases, lymphoproliferative disorders, and sclerosing diseases. Histological diagnosis is very important because treatment and prognosis for these diseases are varied and specific [3].

These hypopigmentary disorders could be classified based on their etiology (congenital or acquired), age of onset (childhood or adulthood) and extent of lesions (localized or generalized) [4]. Further differentiation could be made based on clinical findings, degree of pigment loss, and sites of involvement. The intention of this study is to correlate the histopathological findings with clinical findings of hypo-pigmented disorders of skin to arrive at an accurate diagnosis [5]. Based on this aim of our study is to assess the relative incidence of various disorders causing hypo-pigmented lesions, their site, distribution and characteristics of the hypo-pigmented lesion in each of the diseases. Also, application of hematoxylin-eosin stain and special stains in diagnosing the hypo-pigmented disorders of skin and application of Immunohistochemistry marker to confirm the diagnosis.

MATERIALS AND METHODS

This study was done as a Prospective study from January 2018 to June 2019 for a period of 18 months. After getting ethical committee, clearance 53 samples were collected from the Department of Dermatology, Government Mohan Kumaramangalam Medical College Hospital (GMKMCH). Collected samples were processed and reported in Department of pathology in GMKMCH.

The study included patients of pediatric as well as adult age group presenting with one or more hypo pigmented lesions. Both scaly and non-scaly presentations were included. Cases of chemical leukoderma and leukoderma secondary to topical applications, Cases with lesions only over the face and/or mucosa (due to increased vascularity), cases with generalized hypomelonosis were excluded from the study.

A total of 53 Patients attending the dermatology outpatient department with hypopigmented skin lesions were included for this study. After getting the consent, skin biopsy was taken for all the patients using punch biopsy of size 3.5mm. Classical, hypopigmented lesion was selected for biopsy. After anaesthetizing the area, a biopsy was taken using a disposable punch. With minimal handling, the taken biopsy was transferred to a 10% NBF (neutral buffered formalin) container with proper labeling. The tissue was processed in the following sequence for obtaining paraffin embedded tissue sections; fixation by 10% NBF, dehydration by using ascending grades of alcohol of 50%, 70% and absolute alcohol, clearing by xylene and wax was infiltrated and finally the tissue was embedded in wax with proper orientation. Sections of 6 micron thickness were taken and stained with haemtoxylin and eosin stain. Special stains like PAS (per iodic acid schiff) were done for identifying fungus and fite faraco stain was done for identifying acid fast bacilli.

Immunohistochemistry (IHC) was done for 11 cases selecting one case from each diagnosis using HMB 45 marker. HMB 45 is a monoclonal antibody obtained from an extract of malignant melanoma, which identifies oncofetal glycoconjuagte associated with immature melanosomes and probably related to the tyrosinase enzymatic system. The collected data were analysed with IBM.SPSS statistics software 23.0 Version. To describe about the data descriptive statistics frequency analysis, percentage analysis were used for continuous variables.

RESULTS

During the period of 18 months of study from January 2018 to June 2019, a total of 106 biopsies

of skin, were received. Of these, 53 biopsies were hypopigmented lesions. This formed almost 50% of the skin biopsies received. Pityriasis versicolor was the most common disorder showing 12 cases (22.6%), followed by Hansen's disease which were 10 cases (18.9%) and Discoid Lupus Erythematosus, Polymorphous Light Eruptions were the least observed, one case each (1.9%).

Table 1: Frequency of the hypopigmented disorders

S.No	Diagnosis	Incidence	Percentage
1	Pityriasis versicolor	12	22.6%
2	Hansen's disease	10	18.9%
3	Vitiligo	7	13.2%
4	Lichen sclerosus et Atrophicus	5	9.4%
5	Idiopathic guttate hypomelonosis	4	7.5%
6	Lichen striatus	4	7.5%
7	Pityriasis Lichenoides chronica	3	5.7%
8	Parapsoriasis	3	5.7%
9	Woronoff ring in Psoriasis	3	5.7%
10	Discoid Lupus Erythematosus	1	1.9%
11	Polymorphous Light Eruptions	1	1.9%
Total		53	100

In Histopathological examination also pityriasis versicolor and Hansen's were the most commonly diagnosed constituting about 18.9% and Discoid lupus erythematosus and polymorphous light eruptions were the least observed (1.9%).

The predominant age group involved was 41-60 years. About 16 cases were observed in this age group. The least age of distribution observed was 61-80 years. 10 cases were seen in this age group. The patients under 20 years of age were 15 (28.3%). The pediatric cases seen were three in number. Out of the total 53 study cases, 35 were male (66%) and 18 were female (34%).

Of the 53 cases, the most common site involved was extremities followed by trunk. The Pityriasis versicolor and Hansen's showed multiple sites of involvement. Two cases were found to be seen on the extremities and chest in Pityriasis versicolor and one case of Hansen's was found to involve both the extremity and abdomen. The lesions were classified based on the size and shape of the lesions.

Patch forms the most common type of lesion among the 53 hypopigmented lesions. Few lesions had multiple forms of presentations. Two cases of Pityriasis versicolor showed both macules and patches in the same patient. The vitiligo lesions studied also were in multiple forms like macules and patches. Among the hypopigmented lesions, the non- scaly lesions formed the majority of about 69.8% and the scaly lesions contributed to 16%.

Table 2: Clinicopathological correlation

S. No	Diagnosis	Clinical diagnosis incidence	Clinicopathological correlation	Percentage
1	Pityriasis versicolor	12	10	83.3
2	Hansen's disease	10	10	100
3	Vitiligo	7	7	100
4	Lichen sclerosus	5	5	100
5	Idiopathic guttate hypomelonosis	4	4	100
6	Lichen striatus	4	2	50
7	Pityriasis lichenoides chronica	3	2	66.6
8	Parapsoriasis	3	1	33.3
9	Woronoff ring in psoriasis	3	3	100
10	Discoid Lupus erythematosus	1	1	100
11	Polymorphous Light eruptions	1	1	100
	Total	53	46	86.7

The above table and chart shows the clinicopathological correlation of all the hypopigmented lesions, which was 86.7%. Of this Pityriasis versicolor showed 83% correlation, PLC showed 66.6% correlation, lichen striatus had 50% correlation and 33.3% correlation in parapsoriasis and 100% correlation in other diagnosis. The clinically diagnosed parapsoriatic cases showed nonspecific findings in histopathology in 2 cases and the diagnosis was excluded by IHC, as there was normal immunoreactivity with HMB45 when compared with normal skin.

Immunohistochemistry was done for 11 cases. One case from each diagnosis was selected and HMB45 marker was used to confirm the diagnosis. HMB-45 marker was non immunoreactive in vitiligo and discoid lupus erythematosus whereas cytoplasmic positivity was seen in other diagnosis. In that IGH showed moderate reduction in immunoreactivity. So vitiligo and DLE were classified as melanocytopenic and immunoreactive cases were classified as Melanopenic. In a case of hypopigmented lesion in arm with no scales with a differential diagnosis of pityriasis versicolor and vitiligo, there was a diagnostic dilemma since there were no fungal hyphae or spores, IHC was done and found to be Melanopenic and thus confirmed the diagnosis of pityriasis versicolor.

Table 3: Melanopenic and Melanocytopenic lesions

S.No	Melanopenic	Melanocytopenic
1	Pityriasis versicolor	Vitiligo
2	Hansen's disease	Discoid Lupus erythematosus
3	Lichen sclerosus et atrophicus	
4	Idiopathic guttate hypomelonosis	
5	Lichen striatus	
6	Pityriasis lichenoides chronica	
7	Parapsoriasis	
8	Woronoff ring in psoriasis	
9	Polymorphous Light eruptions	

DISCUSSION

Acquired hypopigmentary disorders encompass a significant group of disorders that affect Indians. The incidence of hypopigmented lesions among the skin biopsies received was 50% in this study as compared to Yalla ASD et al Study [6] where the incidence was 27.3%.

The relative incidence of the various hypopigmented lesions was compared with other similar studies and were found to be concordant. Pityriasis versicolor was the most common disorder and the relative incidence of the hypopigmented lesions studied were compared to Deepadarshan K et al [7] study had results similar to our study.

The etiology of these disorders ranges from infections, autoimmune processes, sclerosing diseases to lymphoproliferative disorders. In this study, hypopigmentary disorders due to infections have contributed to 37.7%, autoimmune disorder contributed to 30.1%, sclerosing diseases for about 9.4%, post inflammatory conditions include 5.6%, and genetic disorder contributed 1.9%. Histological diagnosis is essential as treatment differs for these disorders. Among these disorders, pityriasis versicolor and Hansen were more common in men, which was in concordance with the study of Ghosh SK et al [8]. The predominant age group affected was 41-60 years (32.1%) in this study, which differed from the study of Deepadarshan K et al, which had 21-30 years as the most common age group involved [7] and Yalla ASD et al[6] study showed predominant age group distribution between 30 to 40 years.

In the present study, pityriasis versicolor was the most common disorder, which was concordant with previous studies. Usually, pityriasis versicolor is observed in more physically active younger individuals. This study also proved the fact. Of the 10 cases, 6 were male and 4 were female. Histopathological examination (HPE) of these lesions showed one case with hyperplasic epidermal change, two cases with acanthosis and all the cases showed mild lymphocytic infiltration in the dermis, similar to the study of Abdul wahab S et al [9].

Second most common was Hansen's disease. Among the 10 cases, 6 were male and 4 were female. HPE of these lesions revealed epidermal atrophy (80%) in all the cases except two cases,

whereas epidermal atrophy was 60% in K SS et al study [10]. All the cases showed periadnexal lymphocytic infiltration, and (50%) of the cases showed granulomas in the dermis.

In this study the lesions were all macules and patches with ill defined borders with absence of melanocytes in HPE. Benzekri L et al in his other study[10] stated that hypomelanotic poorly defined border lesions correlated with active lesion and amelanotic sharply demarcated border lesions correlated with stable lesions. So the lesions studied in the present study were active lesions.

Chug et al [11] had conducted clinico-pathological correlation study of acquired hypopigmentary disorders in 50 patients. The overall clinico-pathological correlation in their study was 80%. In this study, there was 86.7% correlation in 53 cases.

Coons et al [12] first conceptualized the principles of immunohistochemical analysis. Generally, Immunohistochemistry is done for confirming the hypopigmented disorders in cases with diagnostic dilemmas. However, here it was done to classify the hypopigmented disorders as melanopenic or melanocytopenic in addition to confirming the diagnosis. The melanocytopenic disorders were devoid of melanocytes and the current study showed vitiligo and DLE to be melanocytopenic.

Seleit et al [13] and Franca AFE da C et al [14] showed vitiligo and DLE were melanocytopenic with HMB 45 marker in their studies respectively. When there is a dilemma between vitiligo and other close differentials like pityriasis versicolor, LSA, pityriasis alba this marker can be used. The melanopenic disorders show normal number of melanocytes but with hypomelanisation, and this finding helps in differentiating the depigmented lesions from others. HMB45 study showed reduced immunoreactivity in melanopenic cases and nonimmunoreactivity in melanocytopenic cases.

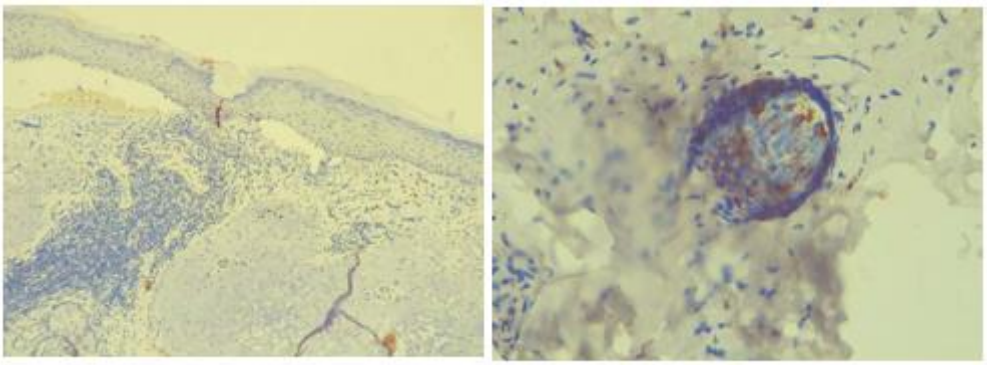

Figure 1 and 2: IHC- HMB45 shows non immunoreactivity and immunoreactivity

CONCLUSION

Based on our study results clinical diagnosis of hypopigmented disorders alone is never specific and cannot be used as a single diagnostic tool for confirmation. Histopathological examination helps in arriving at a specific etiology and good clinicopathological correlation. Furthermore, Immunohistochemistry helps in differentiating between melanopenic or melanocytopenic and in confirming diagnosis. Hence, a systematic approach of clinical, histopathological examination and Immunohistochemistry will provide an accurate diagnosis of hypopigmented disorders and thereby reducing the patient distress.

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