A Cross Sectional Study of Clinical Spectrum and Diagnostic Efficacy of Dermoscopy in Scalp Dermatoses at A Tertiary Care Centre in Southern Rajasthan

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Abstract:

Introduction: In human society, hair and scalp now play an important role in appearance and sexual signalling; original functional roles of protection and heat conservation are secondary and changes in the appearance of skin and hair affect self-esteem and confidence in social settings.

Aims: To study the various clinical patterns and dermoscopic findings of scalp dermatoses in adults.

Settings and Design: An observational cross-sectional study.

Methods and Material: The study was undertaken from 1st January 2019 to 1st June 2020. All adult patients reporting to the Outpatient Department of Dermatology, Venereology and Leprosy, Geetanjali Medical College and Hospital, Udaipur were evaluated for entry into the study and patients having scalp lesions were enrolled. A detailed history of all such patients was taken including general status of the patient, systemic diseases, medication used, precipitating factors such as sunlight, alcohol, smoking, drugs and trauma. Complete clinical and a thorough scalp examination along with dermoscopy was performed.

Results: On studying the demographic profile of the patients with respect to the gender we found that out of 350 subjects, female and male comprised of 61.1% and 38.9% of the subjects respectively. Maximum subjects were in the second decade of the life with a mean age 35±10 years.14% followed by 31-40 years (22.86%). Most common scalp lesion was seborrheic capitis 131(37.4%) followed by psoriasis (83)23.7%. Telogen Effluvium, Androgenetic Alopecia and Alopecia Areata was found among 30(8.6%), 29 (8.3%) and27 (7.7%) of the subjects respectively. In dermoscopy findings among the study subjects most common findung is yellow scales with arborizing vessels in 119(34%) patients followed by red dots with silvery scales in 84(24%) and others findings are yellow dots, miniaturised hairs with single hair in follicular ostium, excalamation mark, yellow crusting, cerebreform pattern, peripilar casts, hypopigmented patches, broken hairs, nits, frogspawn appearance were observed.

Conclusions: This study emphasizes the fact that many of the common dermatoses can significantly involve the scalp and can have overlapping symptoms and presentation making the diagnosis difficult and dermoscopy is helpful for making diagnosis.

Keywords: scalp dermatoses, alopecia, dermoscopy, scalp psoriasis, seborrheic dermatitis.

Introduction

In human society, hair and scalp now play an important role in appearance and sexual signalling; original functional roles of protection and heat conservation are secondary and changes in the appearance of skin and hair affect self-esteem and confidence in social settings. It should also be recognized that scalp changes in some cases may be a sign of a more substantial medical problem, thus making the differential diagnosis critically important. Many of the scalp conditions share similar clinical manifestations of pruritic, scaling, inflammation and hair loss, complicating diagnosis, but a correct diagnosis is essential to initiate a proper treatment [1].

Diagnosis of scalp dermatoses can be elusive and difficult using invasive procedures like scalp biopsy. Newer advances like dermoscopy help in the correct diagnosis of scalp dermatoses[2,3]. Dermoscopic findings allow diagnosis of scarring and nonscarring alopecia along with inflammatory and infectious scalp disorders. The scalp also participates in many systematic disorders and frequently is the chief site of involvement. Similarly, many generalized cutaneous disorders exhibit their most typical manifestations in the scalp. Scalp dermatoses can present with a variety of complaints like itching, flaking, hair loss or skin lesions over the scalp [1].As there is paucity of studies on this subject in a specified population , a clinical study of these scalp dermatoses can unravel the common clinical manifestations in our population.

Due to the above mentioned factors scalp presents as a common site for many dermatological and systemic diseases and makes it an important site to be correlated with clinically.

Subjects and Methods:

The study was undertaken from 1st January 2019 to 1st June 2020. All adult patients reporting to the Out Patient Department of Dermatology, Venereology And Leprosy, Geetanjali Medical College And Hospital, Udaipur were evaluated for entry into the study and patients having scalp lesions were enrolled. A written informed consent was taken from the patients. A detailed and accurate history including demographic data, chief complaints with duration, about lesions, previous treatment history, precipitating factors, associated symptoms, associated skin and medical disorders was recorded. Detailed clinical

examination of the scalp in adequate light for the morphology, anatomical site, number, size, colour changes of the lesion (clinical parameters). General physical examination for the presence of lesions of any associated skin disorder, cutaneous examination and nail examination. Photographs were be taken for documentation. All this information was recorded in a prescribed performa. Following investigations were performed as indicated: Woods lamp, KOH mount, Scalp biopsy and Dermoscopy. CBC, TSH, RBS, LFT, RFT, Urine R/M, ESR, others-ANA etc were done when thought appropriate. All patients in the age group of 18 years and above with scalp lesions were included into the study. Patients less than 18 years of age and those who refuse to participate in the study were excluded.

Results:

A cross sectional study was conducted among 350 patients with scalp lesions attending the out-patient Department of dermatology, venereology and leprosy, Geetanjali Medical College and Hospital.

On studying the demographic profile of the patients with respect to the gender we found that Out of 350 subjects, female and male comprised of 61.1% and 38.9% of the subjects respectively. Hence there was dominancy of females in our study. Maximum subjects were in the second decade of the life with a mean age 35±10 years.14% followed by 31-40 years (22.86%). In our study, 64.3% of the subjects live in urban area while 35.7% of the subjects reside in rural area. Only 12.3% of the subjects were illiterate in our study. Graduate/post-graduation was done by 34% of the subjects. [Table 1]

Table 1: Demographic distribution of patients

Epidemiological feature		Out of 350 cases
Age (years) (mean ± SD)		35±10 years
Gender (female : male)		1.56:1
Inhabitation (%)	Rural	35.7
	Urban	64.3
Education (%)	Literate	87.7
	Illiterate	12.3

Most common scalp lesion was seborrheic capitis 131(37.4%) followed by psoriasis (83)23.7%.

Telogen Effluvium, Androgenetic Alopecia and Alopecia Areata was found among 30(8.6%), 29 (8.3%) and27 (7.7%) of the subjects respectively.

The miscellaneous and rare conditions with scalp dermatoses in our study were Acne Keloidalis Nuchae (0.3%), Atopic LSCH (0.3%), Cherry's

Angioma (0.3%), DLE (0.3%), Folliculitis (2.6%), Haemangioma (0.3%), Lichen Planopilaris (1.1%), Morphea (0.3%), Nevus Sebaceous (0.6%), P. Amiantacea (1.1%), P. Vulgaris (1.4%), Pediculosis (1.4%), Dissecting Cellulitis (0.3%), Pseudopelade Of Brocq (0.3%), Pyogenic Granuloma (0.3%), Tinea Capitis (1.1%), Trichotillomania (0.3%), Verruca (1.1%), Verrucous Epidermal Nevus (0.3%) and Vitiligo (0.6%).[Table 2][Figure 1,3,5,7]

Table 2: Distribution of scalp dermatoses

Scalp Dermatoses	N	%
Seborrheic Capitis	131	37.4
Psoriasis	83	23.7
Alopecia Areata	27	7.7
Androgenetic Alopecia	29	8.3
Cicatricial alopecia (DLE, PPB, morphea, Dissecting cellulitis, Lichen planopilaris, Acne keloidalis nuchae)	9	.3
Folliculitis	9	2.6
P. Amiantacea	4	1.1
P. Vulgaris	5	1.4
Pediculosis	5	1.4
Telogen Effluvium	30	8.6
Tinea Capitis	4	1.1
Others (trichotillomania, VEN, Vitiligo, pyogenic granuloma, atopic LSCH, cherry's angioma, Hemangioma, Nevus sebaceous)	10	.3
Verruca	4	1.1
Total	350	100.0

In the present study, scalp lesion involving whole scalp was found among 81 (23.1%) of the subjects. Frontal, parietal, temporal and occipital area was involved in 205(58.6%), 222 (63.4%), 121(34.6%) and122 (34.9%) of the scalp lesions respectively. [Table 3]

Table 3: Scalp involvement among the study subjects

Site	N	%
Whole Scalp	81	23.1
Frontal	205	58.6
Parietal	222	63.4
Temporal	121	34.6
Occipital	122	34.9

*: statistically significant

In our study, 13 out of 18 alcoholic and 17 out of 26 smokers were having psoriasis, showing statistically significant with this lesion (p<0.05). Stress and seasonal (winter) factors were associated significantly with psoriasis too. Hair oiling and cosmetic procedures were significantly associated with Seborrheic Capitis scalp lesion.

Table 4: Risk factors among the study subjects

Risk Factors	Psoriasis	SeborrheicCapitis	Telogen Effluvium	Others	Total	P value
Sunlight	0	0	0	17	17	<0.01*
Alcohol	13	4	0	1	18	0.03*
Smoking	17	4	0	5	26	0.009*
Stress	17	12	0	1	30	0.04*
Seasonal (Winter)	33	4	0	0	37	<0.01*
Oiling	-	32	0	3	35	<0.01*
Cosmetic Procedures	3	21	16	4	44	0.003*

In dermoscopy findings among the study subjects most common finding is yellow scales with arborizing vessels in 119(34%) patients followed by red dots with silvery scales in 84(24%) and others findings are yellow dots, miniaturised hairs with single hair in follicular ostium, excalamation mark, yellow crusting, cribriform pattern, peripilar casts, hypo pigmented patches, broken hairs, nits, frogspawn appearance were observed. [Table 5] [Figure-2,4.6,8]

Table 5: Dermoscopic findings among the study subjects

Findings	N	%
Nonspecific	23	5.4
Red Dots	1	.3
Yellow Scales	25	7.1
Peripilar Casts+grey blue dots	4	1.1
Cerebreform Pattern	5	1.4
Grey Thick Scales	4	1.1
Loss of follicular openings	1	.3
Hypopigmented Patches	2	.6
Yellow Pustules/Crusting	12	3.4
Broken Hairs	2	.6
Nits	4	1.1
Red Dots+Silvery scales	84	24
Yellow Scales+Arborizing vessels	119	34
Peripilar Casts+Yellow Scales	13	3.7
Yellow dots+Exclamation mark hair	6	1.7
Arborizing vessels+ Loss of follicular openings	2	.6
Arborizing vessels+Frogspawn appearance	1	.3
Broken Hair of Various lengths	1	.3
Yellow Dots+Exclamation Mark Hair+Black Dots	13	3.8
Yellow Dots+Miniaturisedhair+Single hair in follicular ostium	28	8.0

Most common Dermoscopic findings seen in seborrheic capitis are yellow scales, arborizing vessels where as in psoriasis we see red dots and silvery scales. In androgenetic alopecia we see miniaturised hair, single hair in follicular ostium whereas in alopecia areata we see black dots, broken hairs and exclamation hairs. Yellow dots are seen in both androgenetic alopecia and alopecia areata. Table 6

Table 6: Comparison of Dermoscopic findings w.r.t Androgenetic Alopecia, Psoriasis, Alopecia Areata and Seborrheic Capitis

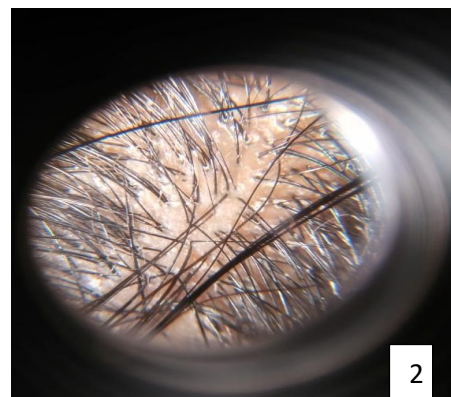| Dermoscopic findings	Seborrheic Capitis	Psoriasis	Androgenetic Alopecia	Alopecia Areata
Yellow Dots	-	-	+	+
Black Dots	-	-	-	+
Red Dots	-	+	-	-
Yellow Scales	+	-	-	-
Silvery Scales	-	+	-	-
Arborizing Vessels	+	-	-	-
Peripilar Casts	-	-	-	-
Cerebreform Pattern	-	-	-	-
Grey Thick Scales	-	-	-	-
Loss Of Follicular Openings	-	-	-	-
Hypopigmented Patches	-	-	-	-
Yellow Pustules/Crusting	-	-	-	-
Frogspawn Appearance	-	-	-	-

Figure 1: Seborrheic capitis   Figure 2: Dermoscopy – Showing greasy scales
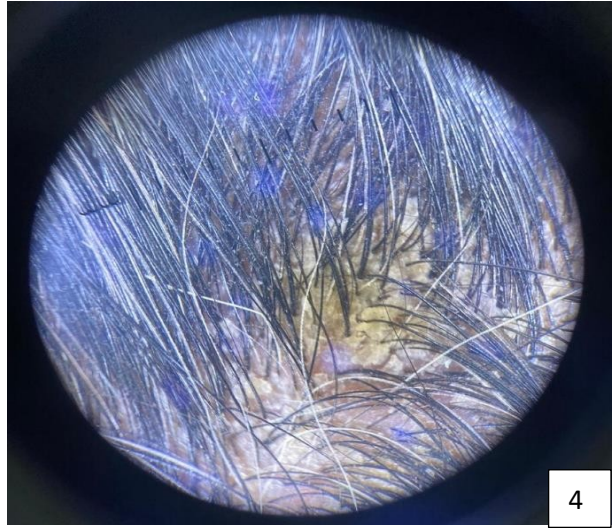
Figure 3: scalp psoriasis
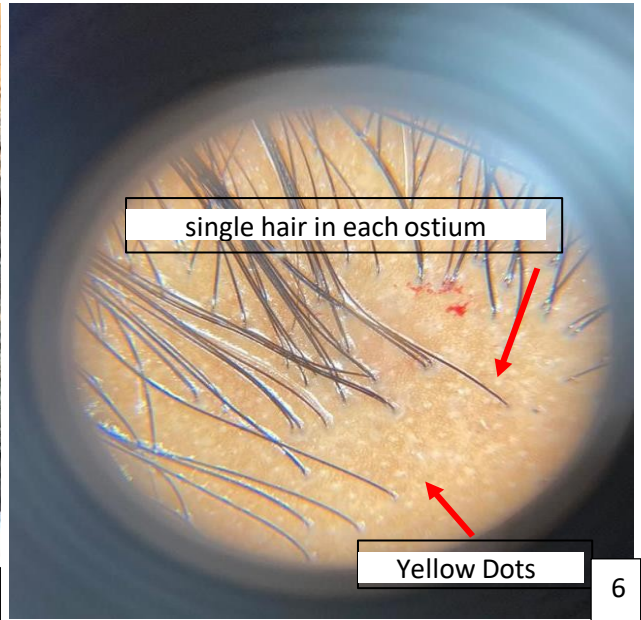

Figure 4: dermoscopy showing silvery scale

single hair in each ostium

Yellow Dots

Figure 5: Androgenic alopecia & Figure 6: Dermoscopy: yellow dots and single hair in Each ostium
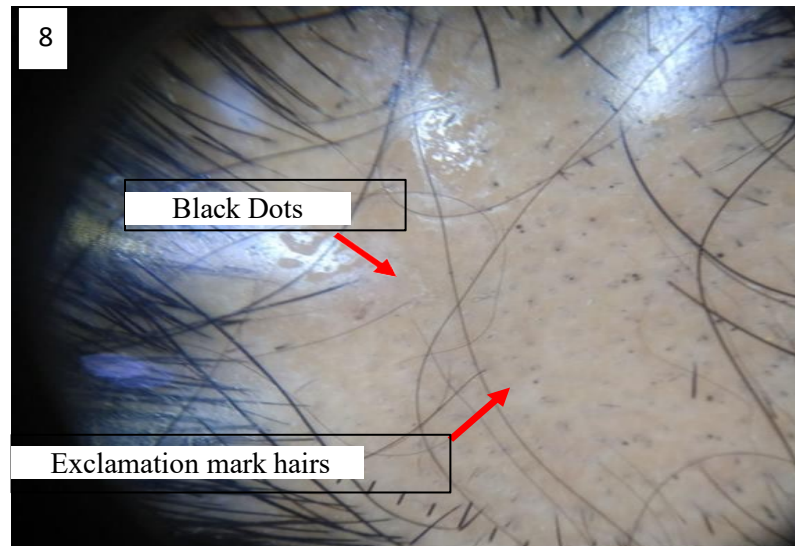

Figure 7: Alopecia Totalis

Figure 8: Dermoscopy of alopecis and few exclamata areata showing dot and few exclamation mark hairs

Discussion

There are no comprehensive studies on the various patterns of scalp dermatoses in the Indian literature. In our study a total of 350 adult patients were enrolled. Out of 350 subjects, female and male comprised of 61.1% and 38.9% of the subjects respectively. There was dominancy of females in our study who were more affected by scalp dermatoses like seborrheic capitis, p.amiantacea, folliculitis, trichotillomania which can be explained by the fact that they are more conscious and use more cosmetics. Manapajon Araya et al in their study also revealed that out of 166 participants, there were more females (56.6%) as compared to the males (43.4%) [4]. Though Aravamuthan R et al [5] and Pillai et al[6] in their study found that the incidence of scalp dermatoses was more common in males than in females with a male to female ratio of 1.8:1 and 1.55:1 respectively.

In the present study, scalp dermatoses involving whole scalp was found among 23.1% of the subjects. Frontal, parietal, temporal and occipital area was involved in 58.6%, 63.4%, 34.6% and 34.9% of the patients respectively. Therefore most common site of involvement was parietal region. Similarly Aravamuthan R et al(5) in their study revealed that most common site involved in scalp dermatoses was parietal (n=146; 73%) followed by frontal (n=125; 62.5%), occipital (n=105; 52.5%), and temporal (n=91; 45.5%). Pillai et al [6], in their study similarly reported that multiple regions of the scalp were affected in 69.6% of the patients, with parietal area being involved in 57.3% of cases.

We found that Androgenetic alopecia, Lichen planopilaris, Pemphigus vulgaris, morphea, Trichotillomania are most commonly found in the Frontal region; Acne keloidalis nuchae, Pediculosis capitis were mostly found in occipital region; Alopecia areata, atopic Lsch, Folliculitis. Maximum subjects were in the second decade of

the life (35.14%) followed by 31-40 years (22.86%). Minimum subjects were in the age group of 51-50 years (11.14%) followed by >60 years (14.29%). As the age advances, a decreasing trend in the incidence of scalp dermatoses was noted, this change can be attributed to decrease in hair density, stress, cosmetic usage with advancing age. In a study by Aravamuthan R et al[5], the most commonly affected age group was 0- 18 years (n=52; 26%) followed by 19-30 years age group (n=50; 25%).

This finding is similar to our study except for the fact that they have included children too in their study. In our study we have excluded children (of <18 years) as they can't give consent, can't come to the OPD and we wanted to study mainly adult scalp dermatoses as many studies have been conducted to study the prevalence of scalp dermatoses in children. Pillai et al(6), et al in their study showed that majority of the patients with scalp dermatoses belonged to the age group of 41-50 years (30.9%), followed by 3rd decade (29.8%).

In our study Psoriasis as well as seborrheic capitis was reported maximum in age group of 18-30 years. Similarly Aravamuthan R et al [5] found that seborrheic dermatitis was noted most in age group of 19-30 years. However Pillai et al [6], in their study found that majority of patients with scalp psoriasis were in the age group of 18- 30 years and 41-50 years. In our study, a total of 25 different types of scalp dermatoses were notes. Most common scalp disorder was seborrheic capitis (37.4%) followed by psoriasis (23.7%). Telogen Effluvium, Androgenetic Alopecia and Alopecia Areata were found among 8.6%, 8.3% and 7.7% of the subjects respectively in the present study.

In a study by Pillai et al[6], found that the most common dermatosis was psoriasis which constituted 33.3% of cases, followed by seborrhoeic dermatitis(18.7%). Aravamuthan R et

al [5] in their study revealed that the most common scalp dermatoses observed in their study was psoriasis (21.5%), followed by alopecia areata (11.5%) and Seborrheic dermatitis (6.5%). Alopecia areata (AA) is postulated to be a hair-specific autoimmune disease, with genetic factors playing a role in disease susceptibility and severity. The lifetime incidence of AA is approximately 2% worldwide.

However, Conti et al [7] reported alopecia (38.93%) as the most common dermatoses in their study in the paediatric population which included hair shaft disorders in their study as well. Dermoscopic findings In case of diagnostic dilemma we performed dermoscopy and/or biopsy on the lesion. In the present study, most common dermoscopic finding was Yellow Scales along with Arborizing vessels; reported among 34% of the subjects. Red Dots with Silvery scales was revealed in 24% of the subjects. Dermoscopic evaluations of psoriasis lesions on the trunk or extremities represented a homogenous vascular pattern of red dots/globules. In a study by Sezin Ficicioglu et al [8] , dermoscopic observations of psoriasis lesions on the scalp often reveal interfollicular twisted loops, which are seen as red dots/globules at lower magnifications and as polymorphous beaded circles at higher magnifications when the probe is positioned vertically on the scalp.

These vascular structures correspond to elongated, dilated capillaries in the dermal papilla and seem to correlate with disease activity[9,10,11], . Kim et al used the term "glomerular vessels" for these dilated capillaries[12] . Examinations of seborrheic dermatitis showed that arborizing vessels and interfollicular simple loops were prominent patterns and that twisted loops, red dots/globules, and glomerular vessels were absent. In seborrheic dermatitis, epidermal hyperplasia is not prominent, and horizontally proliferating vessels along the subpapillary plexus are seen as arborizing vessels [9,12] . Özlem Karadağ Köse et al[13] in their study revealed that findings, such as yellow dots, black dots, black vellus hairs, broken hairs, hair diameter diversity, and gray–white dots, did not show a significant difference between the patient and control groups.

None of the interfollicular findings were significantly different between the two groups. The relatively shorter duration and exclusion of hair shaft disorders were the limitations of our study. Trichoscopy is a non-invasive technique and doesn't require expesnive instruments and is very well accepted by pateints and lead to improvement in quality of care of patients with alopecia and reduces the necessity of taking scalp biopsy Furthermore, we encourage similar studies with larger sample size in different regions for a better

understanding of and to know the role of environmental conditions on the distribution of scalp dermatoses.

Conclusion

In some time or another, majority of the world's population exhibits scalp- related symptoms. Changes in the look of skin and hair impact self-esteem and trust in social contexts. Though scalp dermatoses do not account for majority of the dermatological problems, the psychological impact is significant affecting the social profile of these patients. In order to enhance the quality of life of patients, careful diagnosis and treatment of scalp dermatosis is necessary.

Dermoscopy increasingly important to establish a reliable differential diagnosis dependent on the unique clinical symptoms in order to be able to institute proper treatment. In Indian and Western literature, there are no systematic reports on the distinct clinical patterns of scalp dermatoses and diagnostic value of dermoscopy. This study emphasizes the fact that many of the common dermatoses can significantly involve the scalp and can have overlapping symptoms and presentation making the diagnosis difficult and dermoscopy is helpful for making diagnosis. To the best of our understanding, this is the one among the few Indian study of adult age groups on scalp dermatoses. This research offers accurate clinical insight into scalp dermatoses and thereby allows the dermatologists in the care to properly handle the patient.

Recommendations

Introduction of dermoscopy as a routine diagnostic tool in dermatological examination will be of an excellent aid for accurate diagnosis. The is a need to encourage similar studies with larger sample size in different regions for a better understanding of and to know the role of environmental conditions on the distribution of scalp dermatoses.

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