

## Original Research Article

# An overview of scalp dermatoses in a tertiary care institute

Ramesh Aravamuthan, Sampath Vadivelu, Shabari Arumugam\*, Mukesh Mithran J.

Department of Dermatology, Madras Medical College, Chennai, Tamil Nadu, India

**Received:** 28 December 2019

**Accepted:** 04 March 2020

**\*Correspondence:**

Dr. Shabari Arumugam,

E-mail: [drshabariarumugam@gmail.com](mailto:drshabariarumugam@gmail.com)

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### ABSTRACT

**Background:** The scalp is unique among skin areas in humans, with high follicular density and high rate of sebum production which though providing thermal insulation also creates an environment conducive to superficial mycotic infections and parasitic infestations. As there is a paucity of studies on scalp dermatoses in the Indian and Western literature, a clinical study of these scalp dermatoses can unravel the common clinico-epidemiological manifestations in our population.

**Methods:** This is a prospective observational study conducted for a period of 6 months. All the patients reporting to our department were evaluated for entry into the study and patients having scalp lesions were enrolled. A detailed clinical history and a thorough scalp examination were performed.

**Results:** The incidence of scalp dermatoses is more among adolescents and early adulthood with a male to female ratio 1.8:1. 57% of patients had lesions exclusive to scalp. Scalp was the initial site of presentation in 54.6% of cases who had generalized lesions. Itching (n=107; 53.5%) is the commonest presenting complaint. Among the scalp sites, parietal area was involved the most (73%). The most common dermatoses were psoriasis (21.5%) followed by alopecia areata (11.5%).

**Conclusions:** The scalp dermatoses have significant psychological impact affecting the social profile of the patients. To the best of our knowledge, this is the first Indian study on scalp dermatoses involving all age groups which gives a precise clinical insight into scalp dermatoses.

**Keywords:** Scalp dermatoses, Scalp psoriasis, Alopecia, Scalp dysaesthesia

### INTRODUCTION

The scalp is unique among skin areas in humans, due to its high follicular density and a high rate of sebum production. The scalp is characterized by numerous terminal hair follicles, with most of their bulbs in the subcutaneous tissue. The follicular density is much higher, creating a dark, warm and moist environment providing thermal insulation, however, it makes the scalp vulnerable to dandruff, infections and infestations. Most of the common scalp conditions share similar clinical manifestations of pruritus, scaling, inflammation and hair loss, complicating diagnosis, since a correct diagnosis is essential to initiate proper treatment. Scaling of the scalp

is a common disorder in Children that includes atopic dermatitis, seborrheic dermatitis, tinea capitis, and psoriasis.<sup>1</sup> In a survey of 735 adults in the United States, 39% experienced some flaking, and almost 50% complained of scalp itch.<sup>2</sup>

In human societies, 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, which affect self-esteem and confidence in social settings, have become primary. The good condition of the scalp has a considerable effect on the patient's psychological well-being and social interaction. The

visibility of this part of the skin and the presence of hair, limit the supply of possible remedies for their difficult application and unsuitable cosmetic effect. Therefore, the scalp is usually chosen different galenic forms than in other parts of the skin. As there is a paucity of studies on scalp dermatoses in the Indian and Western literature, a clinical study of these scalp dermatoses can unravel the common clinical manifestations in our population. This article gives a precise clinical insight into scalp dermatoses including scalp dysaesthesia among the population reporting to a tertiary care center in South India, thereby, helps the treating dermatologists manage the patient better.<sup>3-5</sup>

## METHODS

The study was a prospective observational study conducted for a period of 6 months from June 2019 to November 2019. All patients reporting to the department of dermatology, Madras medical college and Rajiv Gandhi government general hospital, Chennai were evaluated for entry into the study and patients having scalp lesions were enrolled. The number of participants in our study is 200. A detailed history of all such patients including general status of the patient, systemic diseases were taken. A complete clinical examination and a thorough scalp examination was performed. The clinical diagnosis was established. In relevant cases, necessary investigations were done to establish the definitive diagnosis. The data collected were documented in google sheets. Data was analysed using SPSS windows software version 17.0.

## RESULTS

A total of 200 patients with scalp dermatoses were included in the study. Out of this, 128 (64%) were males and 72 (36%) were female (Figure 1A). The incidence of scalp dermatoses was more common in males than in females with a male to female ratio of 1.8:1.

The age of our patients ranged from day 1 of birth to 82 years. The most commonly affected age group was 0-18 years (n=52; 26%) followed by 19-30 years age group (n=50; 25%). As the age advances, a decreasing trend in the incidence of scalp dermatoses was noted (Figure 1B).

Itching (n=107; 53.5%) was the most common presenting symptom followed by hair loss (n=93; 46.5%), scales (n=68; 34%) and redness (n=18; 9%) (Figure 2A). Most patients had multiple symptoms.

The most common site involved in scalp dermatoses, in general, was parietal (n=146; 73%) followed by frontal (n=125; 62.5%), occipital (n=105; 52.5%), and temporal (n=91; 45.5%) (Figure 2B). These site distributions include both isolated and multiple site involvements. However, these values become more meaningful when they are studied in reference to specific scalp dermatoses.

Psoriasis vulgaris including scalp psoriasis (n=43; 21.50%), alopecia areata (n=23; 11.5%), seborrheic dermatitis (n=13; 6.5%), tinea capitis (n=12; 6%), androgenic alopecia (n=11; 5.5%) were the common scalp disorders noted during the period of our study (Table 1). Scaling disorders of scalp (n=61; 30.50%) and alopecia (n=54; 27%) were the most common disease categories in our study (Table 2).

Among the 200 cases, 114 (57%) patients had lesions which were exclusive to scalp. Of those who had lesions elsewhere including scalp lesions (n=86), scalp was the initial site in 47 patients (54.65%).

The statistical values of some of the common scalp disorders have been presented below.

Scalp psoriasis, chronic plaque psoriasis with scalp manifestation, psoriatic erythroderma (Figure 3 A-C) and sebopsoriasis, the most common scalp dermatoses, were noted in 43 patients (21.5%). Its incidence peaked in 46-60 years age group (n=14, 32.5%). Among those with generalized psoriatic plaque lesions (n=30), scalp was the initial site of presentation in 19 (63%) of patients. The most common symptom during the presentation was itching and scaling (n=38; 89%). The most common site was parietal region (n=35; 81%), however, most cases presented with multiple site involvement in scalp.

The total number of patients with Alopecia areata in our study was 23 contributing to 11.5% of the total dermatoses (Figure 4A). Alopecia universalis was seen in 2 patients (1%). Majority of the patients with alopecia areata belonged to the age group of 0-18 years (n=10, 43.5%) with no gender variation. Apart from hair loss very few presented with itching (n=3; 13%). The parietal (n=18; 78%), and occipital (n=17; 74%) regions of the scalp were commonly involved.

Seborrheic dermatitis was noted in 13 (6.5%) patients. The most common age group was 19-30 years (n=8, 61.5%) with male predominance (n=12, 92%); male-female ratio is 12:1. The predominant symptoms were itching (n=11, 85%), and scales (n=10; 77%). Lesions were scalp exclusive in 5 (38%) cases.

Tinea capitis (Figure 5A and B), comprising non-inflammatory, inflammatory and glabrata types, accounted for 6% (n=12) of total scalp dermatoses. Incidence is more among children and adolescents i.e., 0-18 age group (n=9; 75%). Males were affected more than females; male-female ratio 3:1. Most cases presented with itching (n=10; 83%) and hair loss (n=9; 75%); most of the lesions were scalp exclusive (n=9; 75%); common sites include parietal (n=6; 50%) and occipital (n=5; 42%).

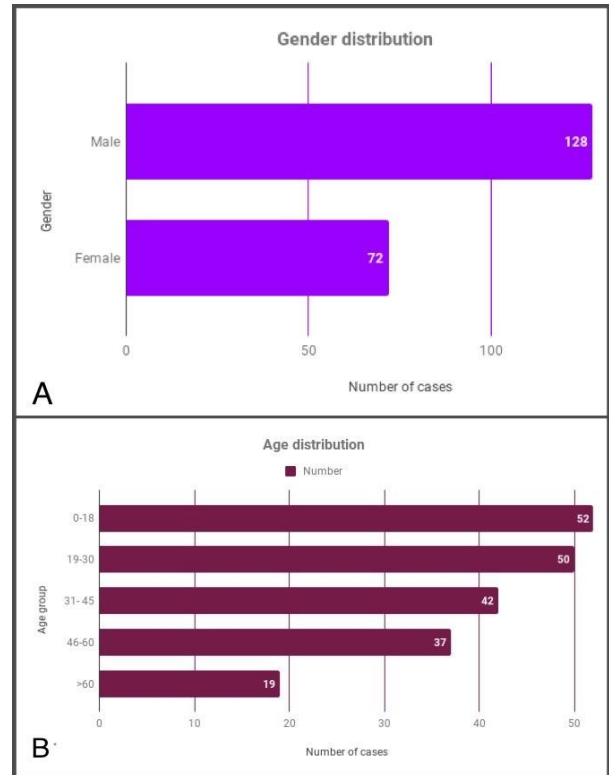
Male pattern hair loss (Figure 4C) (n=11; 5.50%) commonly noted in 19-30 age group (n=8; 73%);

common sites include frontal (n=11; 100%) followed by parietal (n=7; 64%).

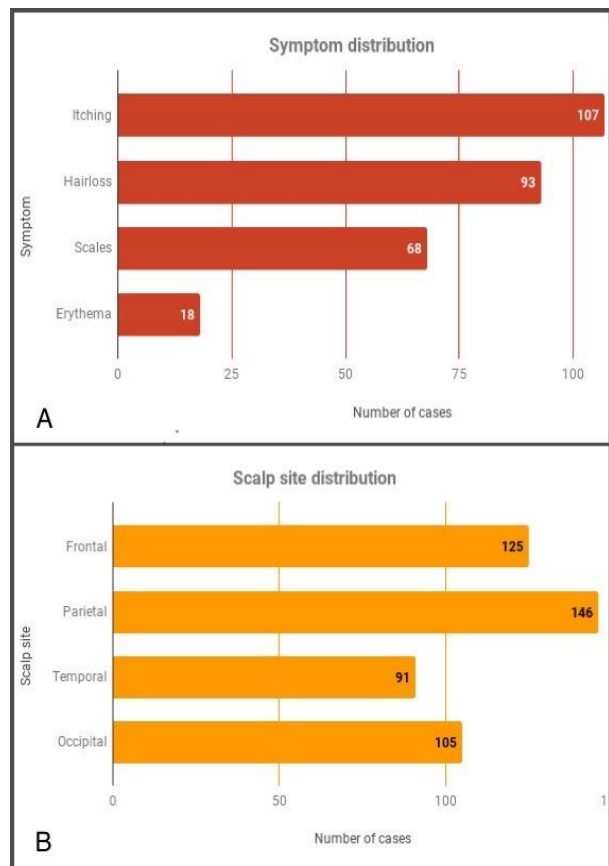
**Table 1: Distribution of scalp dermatoses.**

Scalp dermatoses	Number	Percentage (%)
Psoriasis vulgaris	30	15.00
Alopecia areata	23	11.50
Scalp psoriasis	13	6.50
Seborrheic dermatitis	13	6.50
Tinea capitis	12	6.00
Male pattern hair loss	11	5.50
Cicatricial alopecia	7	3.50
Pemphigus vulgaris	7	3.50
Vitiligo vulgaris	7	3.50
Discoid lupus erythematosus	6	3.00
Contact dermatitis	6	3.00
Scalp folliculitis	6	3.00
Acne keloidalis nuchae	4	2.00
Pediculosis capitis	4	2.00
Pityriasis capitis	4	2.00
Verruca vulgaris	4	2.00
Lichen plano pilaris	3	1.50
Scalp dysaesthesia	3	1.50
Trichotillomania	3	1.50
Alopecia7 universalis	2	1.00
Aplasia cutis congenita	2	1.00
Cutis verticis gyrata	2	1.00
Langerhans cell histiocytosis	2	1.00
Nevus sebaceous	2	1.00
Pilar cyst	2	1.00
Miscellaneous	22	11.00

The other scalp dermatoses presented during the course of our study in addition to the above, in order of decreasing incidence, include Cicatricial alopecia (n=7, 3.5%) (Figure 4D); Pemphigus vulgaris (n=7, 3.5%) (Figure 7D); Vitiligo vulgaris (n=7, 3.5%) (Figure 7A); contact dermatitis (n=6, 3%) (Figure 7B); scalp folliculitis (n=6, 3%); discoid lupus erythematosus (n=6, 3%) (Figure 7C); acne keloidalis nuchae (n=4,2%) (Figure 6A); Pediculosis capitis (n=4, 2%); Pityriasis capitis (n=4, 2%); Verruca vulgaris (n=4, 2%) (Figure 5D); Lichen plano pilaris (n=3, 1.5%); scalp dysaesthesia (n=3, 1.5%); trichotillomania (n=3, 1.5%) (Figure 4B); aplasia cutis congenita (n=2, 1%) (Figure 5C); cutis verticis gyrata (n=2, 1%) (Figure 6C); Langerhans cell histiocytosis (n=2, 1%) (Figure 8A); nevus sebaceous (n=2, 1%) (Figure 6D); pilar cyst (n=2, 1%) (Figure 8B); lichen planus (n=1) (Figure 3D); mycosis fungoides (n=1) (Figure 8D); seborrheic keratosis - acanthotic type (n=1) (Figure 8C); linear morphea – en coup de sabre (n=1) (Figure 6B), etc.



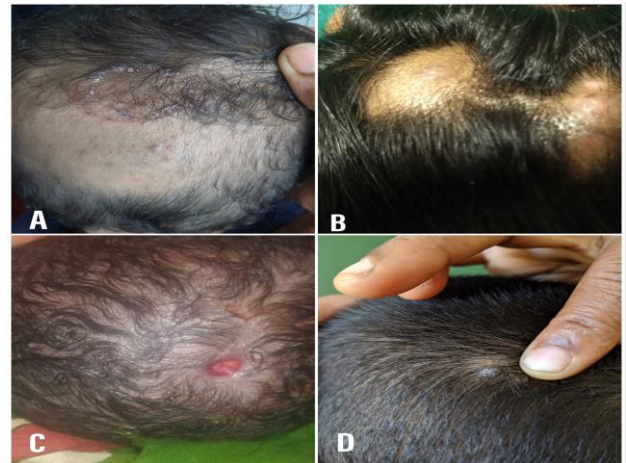
**Figure 1: (A) Gender distribution and (B) age distribution.**



**Figure 2: (A) Symptom distribution, (B) scalp site distribution.**

**Table 2: Distribution of disease category.**

Disease category	Number	Percentage (%)
Scaling disorders of the scalp	61	30.50
Alopecia	54	27.00
Thickened scalp disorders	5	2.50
Tumors of scalp	3	1.50
Infections and infestation of scalp	30	15.00
Pustular conditions of scalp	3	1.50
Other scalp disorders	44	22.00



**Figure 5: (A) Tinea capitis, (B) tinea capitis - abscess type, (c) aplasia cutis congenita, (d) verruca vulgaris.**



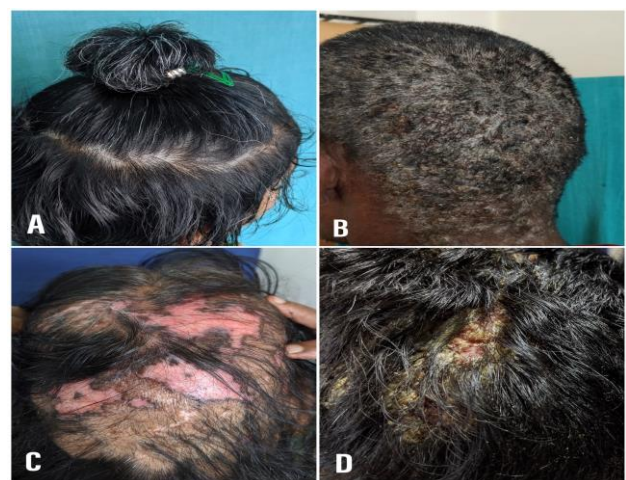
**Figure 3: (A) Psoriatic erythroderma (infant), (B) psoriatic erythroderma (adult), (c) scalp psoriasis, (d) lichen planus.**



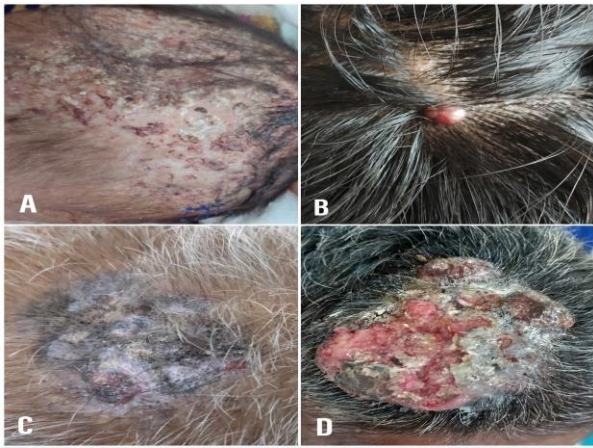
**Figure 6: (A) Acne keloidalis nuchens, (B) linear morphea, en coup de sabre, (c) cutis verticis gyrata, (d) nevus sebaceous.**



**Figure 4: (A) Alopecia areata, (B) trichotillomania, (c) male pattern hair loss, (d) cicatricial alopecia - pseudopelade of brocq.**



**Figure 7: (A) Vitiligo vulgaris with leukotrichia, (B) cement induced eczema, (c) discoid lupus erythematosus, (d) pemphigus vulgaris.**



**Figure 8: (A) Langerhans cell histiocytosis, (B) pilar cyst, (c) seborrheic keratosis - acanthotic type, (d) mycosis fungoides.**

## DISCUSSION

The skin of the scalp has several unique features that aid in its critical role of protecting the head. First, the follicular density is much higher, creating a dark, warm and moist environment providing thermal insulation however makes the scalp vulnerable to infections and infestations. Second, in adults there is a high rate of sebum production, which along with desquamated skin cells can provide a food source for microorganisms. Finally, the scalp skin is subjected to brushing and contact with fingers, combs, hats, other styling implements that can cause frictional injury and may introduce microorganisms, thereby increasing the likelihood of infections and infestations. Pruritus, hyperkeratosis (scaling), alopecia, and inflammatory signs (erythema, purulence) are common symptoms of scalp disorders. The psychological impact which the visible scalp disorders make is very high.

The findings of our study are compared with the study on scalp dermatoses among adults by Pillai et al.<sup>6</sup> The most common age group in our study was 0-18 years (26%), followed by 19-30 (25%) which is not the same as the observations by Pillai et al, whereas the most common gender and the scalp site were the same in both studies. The most common scalp dermatoses observed in our study was psoriasis (21.5%), followed by alopecia areata (11.5%) and Seborrheic dermatitis (6.5%), which is in discordance with the previously published study.

Psoriasis is a chronic inflammatory disease affecting approximately 2% of the population.<sup>7</sup> Henseler and Christophers reported bimodal age at onset. Type I begins on or before age 40 years; type II begins after the age of 40 years. Type I disease accounts for more than 75% of cases.<sup>8</sup> Patients with psoriasis have a reduction in their quality of life similar to or worse than patients with other chronic diseases, such as ischaemic heart disease and diabetes.<sup>9</sup> Incidence of scalp psoriasis varies from

50% to 90%.<sup>10,11-13</sup> Scalp manifestations may be the only sign or part of generalized plaque psoriasis along with focus elsewhere on the body. Genetic predisposition and environmental factors play a vital role in the incidence of psoriasis.

Scalp psoriasis manifests as erythematous patches and silvery-white scales that flake. The involved skin is exceedingly dry, often causing cracking and bleeding on its surface. The lesions on the scalp are mainly very pruritic. Many patients also complain about sensations of pain or burning. Patients with scalp psoriasis are particularly susceptible to the Koebner phenomenon - reformation of psoriasis as a result of injury including routine hair care. Scraping and scale removal can be a cause of secondary and temporary alopecia. Patients often experience the feeling of shame, embarrassment or self-consciousness about their scalp lesions and as a consequence wear hats or grow their hair long to hide the defect.

The treatment of psoriasis in the scalp is difficult. A large group of psoriatic patients with severe scalp involvement presents mild involvement of the body skin and in consequence, they may not meet the criteria to receive systemic therapy for moderate-to-severe Psoriasis vulgaris. Thus, the most frequent therapy is based on topical agents, such as coal tar, corticosteroids, and vitamin D analogs. Nevertheless, it is challenging to apply them on the scalp due to hair - many patients quit this therapy as it is cosmetically unacceptable for them. These facts contribute to non-adherence and dissatisfaction with this therapeutic option. Additionally, topical agents usually have only a temporary effect and lead to frequent recurrence. Localized ultraviolet B therapy (fiber-optic hair brushes) is a helpful alternative for patients. The use of systemic agents, including methotrexate, cyclosporin A and biologics, is highly desirable in severe scalp psoriasis but currently still remains an off-label indication.<sup>14</sup>

Alopecia can be non-cicatricial or cicatricial. Non-cicatricial alopecia includes male pattern hair loss, telogen effluvium, alopecia areata, trichotillomania, psoriasiform alopecia, etc. Cicatricial alopecia can be primary or secondary.

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.<sup>15</sup> Population studies found no sex predominance. AA patients are at risk for depression and anxiety, atopy, vitiligo, thyroid disease, and other autoimmune conditions. AA commonly presents as round or oval patches of nonscarring hair loss. Short 'exclamation point' hairs can often be seen, particularly at the margins of areas of alopecia. Treatment modalities include topical and intralesional corticosteroids, topical irritants (e.g., anthralin, tazarotene, azelaic acid), topical minoxidil,

topical immunotherapy (e.g., squaric acid dibutyl ester, diphencyprone), systemic corticosteroids, pulsed dosing, systemic JAK/STAT pathway inhibitors: tofacitinib, ruxolitinib. Topical or oral photochemotherapy (PUVA), excimer laser, systemic cyclosporine.<sup>16</sup>

Male pattern hair loss has substantial psychosocial impacts. The proportion of men with moderate to extensive hair loss increased with increasing age, ranging from 16% for men 18-29 years of age to 53% of men 40-49.<sup>17</sup> Over 250 independent genetic loci have been found to be associated with severe hair loss.<sup>18</sup> Minoxidil, finasteride, and low-level laser light therapy are effective for promoting hair growth in men with androgenetic alopecia and that minoxidil is effective in women with androgenetic alopecia.<sup>19</sup>

Trichotillomania is characterized by the repetitive pulling out of one's own hair leading to hair loss and functional impairment. Treatment includes habit reversal therapy and medication (n-acetylcysteine or olanzapine).<sup>20</sup>

Primary cicatricial alopecia, aka 'scarring alopecia', encompasses a group of hair loss disorders in which the hair follicle is irreversibly destroyed and replaced by fibrous tissue. Hair regeneration is prevented because of the destruction of epithelial stem cells in the bulge of the outer root sheath at the level where the arrector pili muscle inserts. Secondary cicatricial alopecia is due to a non-follicle-directed cause, such as thermal burns, metastatic cancer, trauma or radiation. Neutrophilic cicatricial alopecia includes folliculitis decal vans and dissecting cellulitis of the scalp. Lichen planopilaris, chronic cutaneous lupus erythematosus, frontal fibrosing alopecia, acne keloidalis nuchae, central centrifugal cicatricial alopecia, and Brocq pseudopelade are lymphocytic forms of alopecia. A number of treatments are used empirically; however, they are not supported by data from clinical trials.<sup>21</sup>

Seborrheic dermatitis (SD): It's incidence peaks during three age periods - in the first three months of life, during puberty, and in adulthood with an apex at 40 to 60 years of age. The presence and abundance of *Malassezia* yeast, host epidermal conditions, and sebaceous secretion, combined with various other factors, and interactions between these factors, determine an individual's susceptibility to SD and dandruff.<sup>22</sup> The characteristic symptoms-scaling, erythema, and itching-occur most often on the scalp, face, chest, back, axilla, and groin. Over-the-counter shampoos may be used as first-line treatment of SD of scalp. Antifungal shampoos (long-term) and topical corticosteroids (short-term) can be used as second-line agents for scalp SD.<sup>23</sup>

Tinea capitis is a superficial fungal scalp disease caused by dermatophytes. The most common occurrence is in children, where it is transmitted by direct contact, using combs, headgear and other personal items. In 1979, Kamalam and Thambiah observed that tinea capitis was

endemic in school children in Madras.<sup>24</sup> The main agents are *Trichophyton* (*endothrix* and *ectothrix*) and *Microsporum* (*ectothrix*). Most infections in recent years have been caused by *Trichophyton tonsurans* and *Microsporum canis*. The clinical picture varies with the causative agent and also with the condition of the host organism. The lesions may be inflammatory (kerion and favus) or non-inflammatory (grey patch and black dot types). Treatment is by topical and systemic antifungal agents.

Scabies may present as fine scaling of the scalp mimicking SD among immunocompromised patients. Pruritus may be mild or absent in these patients. These patients should be treated with whole-body and scalp anti-scabietic treatment.<sup>25</sup>

Pediculosis capitis: Itching of the scalp is the chief symptom. Presence of viable nits confirms the diagnosis of head louse infestation. Secondary bacterial infection with impetiginisation with cervical and occipital lymphadenopathy may occur. Screening and treatment of all close contacts are necessary for adequate management of pediculosis. Medical management requires proper application of topical pediculicidal agents, chiefly 1% permethrin lotion, systemic Ivermectin and wet combing with a fine-tooth comb.<sup>26</sup>

Scalp folliculitis, a common condition, is an inflammatory disease of the pilosebaceous follicle of the scalp. Typically, our patients presented with painful bumps while combing. There are three groups: infectious folliculitis, non-infectious folliculitis, and perifolliculitis. Bacteria, viruses, and fungi are the infectious causes whereas folliculitis decal vans capillitii, perifolliculitis capitis abscondens et suffodiens, erosive pustular dermatitis, lichen planopilaris, eosinophilic pustular folliculitis, etc are the noninfective causes. The diagnosis of folliculitis occasionally requires histologic confirmation.<sup>27</sup>

Pemphigus: scalp involvement, observed in 65% of patients with pemphigus vulgaris, is associated with higher disease severity, longer time to achieve complete clinical and serological remission and may indicate the need for a more aggressive therapeutic approach.<sup>28</sup>

Discoid lupus erythematosus (DLE) is characterized by persistent scaly, disk-like plaques on scalp, face, and ears that may cause pigmentary changes, scarring, and hair loss. Scarring alopecia was present in 34% of patients with DLE and was associated with a prolonged disease course. There was a significant reduction in the size of sebaceous glands in affected scalp. Loss of a population of mid-follicular stem cells may be important in the pathogenesis of scarring alopecia in DLE.<sup>29</sup>

Acne keloidalis nuchae (AKN), a chronic form of scarring folliculitis, is seen in post-pubertal men and is rare after the age of 55 years. Clinically, papules,

pustules, and sometimes tumorous masses in the nuchal or occipital regions of the scalp similar to our patients.<sup>30</sup>

Scalp dysaesthesia is described as chronic severe pain and/or pruritus of the scalp without any objective findings.<sup>31</sup> The symptoms may be manifestations of an underlying psychiatric disorder or may represent a type of chronic pain syndrome. The authors postulated that chronic muscle tension placed on the pericranial muscles or scalp aponeurosis secondary to the underlying cervical spine disease may lead to the symptoms of scalp dysaesthesia.<sup>32</sup> Though uncommon, we encountered 3 cases of scalp dysaesthesia during the study period. The nature of the disease was explained to the patient and reassured. Pregabalin and low-dose antidepressants have been used in the management of scalp dysaesthesia.<sup>33</sup>

Aplasia cutis congenita is a condition in which localized or widespread areas of skin are absent at birth. The disorder is seen most frequently on the scalp, often as a solitary lesion without other anomalies as noted in our cases also.<sup>34</sup>

En coup de sabre is a descriptive term denoting linear scleroderma of the frontoparietal area of the face and scalp. This specific type of morphea is associated with neurological symptoms.<sup>35</sup>

Cutis verticis gyrata is a descriptive term for a condition of the scalp consisting of deep grooves and convolutions that resemble the surface of the brain. Physical examination of the scalp shows cerebriform appearance with accentuating folds and deep furrows (cutis verticis gyrata), thickening in the face, frontal and parietal regions as observed in our patients also.

Nevus sebaceous is a hamartoma composed of abnormal epidermal and dermal components with clinical and histopathological features that change with aging. Regarding the histopathology, acanthosis, papillomatosis, and basal layer pigmentation were the most frequent findings. Skin adnexal changes were frequently noted, including sebaceous gland hyperplasia (93.5%) and primitive hair follicles (76.8%). In 88.5% of scalp lesions, markedly decreased terminal hair was observed. Development of malignancies in sebaceous nevi is a rare phenomenon, and decision for excision of the lesion should be made after thorough evaluation of the pros and cons.<sup>36</sup>

Langerhans cell histiocytosis (LCH) can occur at any age but is more frequent in the pediatric population. The traditional classification of LCH in Hashimoto-Pritzker disease, eosinophilic granuloma, HSC, and Letterer-Siwe disease has been abandoned because the disease spectrum is broader than that of the traditional classification and many patients do not fit into these clinical subtypes. Also, the clinical course change with time. The new classification considers the extent of organ involvement as this has significant implications for treatment and

prognosis. We encountered 2 cases of LCH in the infantile age group who had lesions over scalp and without any systemic manifestations. LCH should be kept in mind as a rare, but important, differential diagnosis when eczema, miliaria, scabies, varicella, seborrheic dermatitis, folliculitis or candidiasis lesions are seen, especially if they are resistant to therapy and are spreading.<sup>37</sup>

Pilar cysts are common, occurring in 5-10% of the population; commonly seen in females.<sup>38</sup> They occur preferentially in areas with dense hair follicle concentrations; therefore, 90% occur in the scalp. They are the most common cutaneous cyst in the scalp. Pilar cysts are almost always benign, with malignant transformation occurring rarely.

Cancers of the scalp are uncommon. Squamous cell carcinoma is the most common cancer followed by basal cell carcinoma. Other cancers are sweat gland carcinoma, angiosarcoma, dermatofibrosarcoma protuberans, liposarcoma, fibrosarcoma and malignant lymphoma. When localized, scalp cancers are managed like other skin cancers but once they invade bone, they become aggressive and are difficult to eradicate. Wide radical excision provides cure and the skull bone if involved should be removed.<sup>39</sup>

Mycosis fungoides is the most common form of cutaneous T-cell lymphoma. It is characterized by infiltrates of lymphocytes. It has an indolent clinical course, usually slowly progressing from patches to thicker plaques and eventually to tumours. According to Mellenberg et al, 4x4 technique has proven to be useful in the treatment of mycosis fungoides confined to the scalp.<sup>40</sup>

The major strength of this study is the prospective nature of the study design and a relatively larger sample size whereas the limitations include a relatively shorter duration. 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

Majority of the world's population experiences scalp related symptoms at some point or the other. Changes in the appearance of scalp and hair affect self-esteem and confidence in social settings. Proper management of scalp dermatoses is essential to improve the quality of life of the patients. Developing an accurate differential diagnosis based on the unique clinical manifestations is critically important so that proper treatment can be instituted. There are no comprehensive studies on the various clinical patterns of scalp dermatoses in Indian and Western literature. To the best of our knowledge, this is the first Indian study on scalp dermatoses of all age groups. This study gives a precise clinical insight into

scalp dermatoses and thereby helps the treating dermatologists manage the patient better.

*Funding: No funding sources*

*Conflict of interest: None declared*

*Ethical approval: The study was approved by the institutional ethics committee*

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**Cite this article as:** Ramesh A, Sampath V, Shabari A, Mukesh MJ. An overview of scalp dermatoses in a tertiary care institute. *Int J Res Dermatol* 2020;6:304-12.