

Scalp dermatoses: The patterns and impact on quality of life

Shaziya Kalam, Jayadev B Betkerur, PSS Ranugha, Veeranna Shastry

Department of Dermatology, Venereology and Leprosy, JSS Medical College and Hospital/ JSS Academy of Higher Education, Mysuru, Karnataka, India.

Abstract

Background The scalp is unique due to high follicular density and sebum production. Scalp diseases can occur as primary diseases, part of generalized disease or as a part of systemic disease.

Objective To study clinico-epidemiological profile of scalp dermatoses and their effect on quality of life (QoL).

Methods Groups 1 and 2 containing 268 patients with primary scalp complaints (PSC) and 260 patients with no PSC but suffering from diseases where scalp involvement is expected were recruited. History taking, examination and relevant investigations were done. In Group 1, QoL was assessed using modified Dermatology Life Quality Index (DLQI).

Results A male preponderance (54.5%) and mean age of 37.17 years were seen in patients with PSC. Most patients came with itching (60.8%) while scaling (27.7%) was the common sign. Overall, scalp was the common initial site while frontal scalp was the predominant region. Pityriasis capitis, infections and psoriasis were common while sensitive scalp was rare. DLQI was less than 10 in majority (85.4%).

Conclusion Scalp dermatoses may be localized or the initial site of generalized dermatoses. The effect on QoL is minimal unless the disease is generalized.

Limitations Difficulty in assessing QoL in scalp dermatoses using questionnaire designed for generalized dermatoses.

Key words

Scalp; Sensitive scalp; DLQI; Quality of life; Psoriasis; Seborrheic dermatitis.

Introduction

With a surface area of approximately 600 cm², the scalp acts both as a physical barrier and thermal insulator. The high follicular density of scalp and repeated trauma due to combing, brushing and styling create an environment favorable for infection.¹

Scalp diseases can occur as a primary disease, as part of generalized skin disease or as part of systemic disease. Since the scalp is often affected early, it can be an indicator of an underlying substantial disease. However, many scalp dermatoses may have identical clinical presentations, posing problems for diagnosis.² Diseases of the scalp can affect both physical and psychological quality of life leading to discomfort, loss of self-esteem and depressive symptoms.³

Even though scalp disorders are a common complaint affecting the general population, due

Address for correspondence

Dr. Shaziya Kalam
407 A block, Brigade mountain view apartments
Ooty road, Mysore Karnataka, India.
Ph: 8921902402
Email: shaziya.kalam@gmail.com

attention has not been given to the study of clinico-epidemiological profile and quality of life (QoL) in patients with scalp dermatoses. A clear understanding of scalp dermatoses in terms of demographic distribution, common clinical presentations, unique features and effect on QoL can help in early diagnosis and better management of these disorders.

Materials and methods

This was an observational study carried out in a tertiary care hospital from November 2018 to July 2020 after obtaining ethics committee approval and informed consent from all study subjects.

Two hundred and sixty eight patients presenting with primary scalp complaints (PSC) were recruited as the first group while the second group comprised 260 patients with no PSC but diagnosed with dermatoses where scalp involvement was expected. Detailed history taking and complete clinical examination pertaining to the clinical diagnosis was done for each patient. Necessary investigations were done in relevant cases to establish the definitive diagnosis. QoL was assessed for Group 1 patients using a questionnaire specifically modified for scalp disorders derived from the Dermatology Life Quality Index (DLQI).⁴

Statistical analysis was done using SPSS version 16.0 software for Windows. The descriptive statistics were done by using mean, median, standard deviation, frequency and percent. To obtain the association for categorical variables, Chi square test was applied and $p < 0.05$ was considered statistically significant.

Results

The study evaluated 528 patients– 268 with PSC (50.8%) in first group and 260 in second group

with no PSC but diagnosed with dermatoses where scalp involvement was expected (49.2%).

Mean age among group 1 was 37.17 years and group 2 was 39.97 years. Most of the cases fell under the age group of 15 to 30 years in both groups ($p=0.001$). A definite male preponderance was noted in group 1 (54.5%) whereas female patients formed the majority (53.5%) in group 2. Housewives were found to be the most commonly affected group overall (27.7%) and in the second group (31.5%) whereas students (25.4%) were most commonly affected in the group with PSC. Other commonly affected occupations in the first group included housewives (23.9%), farmers (14.9%) and office workers (11.2%).

The duration of illness was less than 10 weeks in 37.7% of subjects in group 1 and 28.8% in group 2 ($p=0.11$). The most common initial site of involvement overall was scalp (48.1%) followed by lower limbs (18.0%) and upper limbs (14.4%). Among the 268 patients who had PSC, 196 patients (73.1%) had complaints which were exclusive to scalp and not involving any other part of the body.

Itching (60.8%) was a common symptom, followed by flaking (24.3%), pain (13.4%) and burning sensation (6.7%) while 15.7% of had no symptoms despite lesions on scalp. Lesions on scalp were found in 353 patients comprising 268 patients of group 1 and 85 patients of group 2. Scaling was the most common examination finding (27.7%) followed by patch (13.2%), erythema (12.5%) and plaques (11.6%) (**Figure 1**).

Twelve patients in group 1 had symptoms (itching and burning) without any lesions and were diagnosed as cases of sensitive scalp. The frontal region was the most common primary site in group 1 (48.5%) and group 2 (43.5%) (**Table 1**).

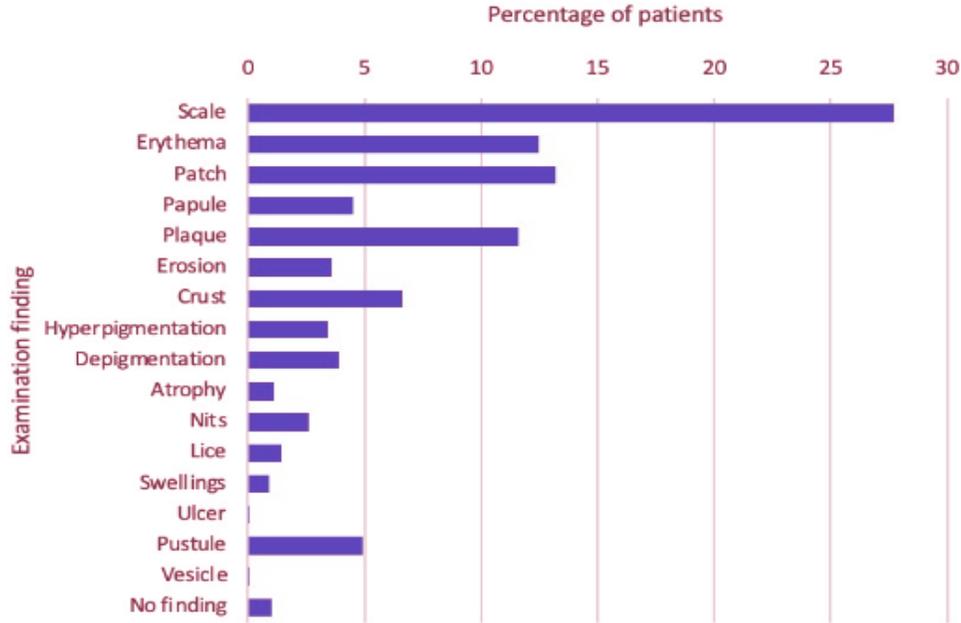


Figure 1 Examination findings in scalp dermatoses.

Table 1 Area of scalp involved.

Primary area involved	Group		Total
	With PSC	Without PSC	
Frontal	130 (48.5%)	37 (43.5%)	167 (47.3%)
Parietal	29 (10.8%)	11 (12.9%)	40 (11.3%)
Temporal	28 (10.4%)	7 (8.2%)	35 (9.9%)
Occipital	50 (18.7%)	20 (23.5%)	70 (19.8%)
Vertex	31 (11.6%)	10 (11.8%)	41 (11.6%)
Total	268 (100.0%)	85 (100.0%)	353 (100.0%)

Winter (7.8%) and sunlight (3.7%) were the exacerbating factors in group 1 (p=0.02). Comorbidities observed in group 1 included diabetes mellitus (DM) (7.5%), hypertension (HTN) (5.2%) and hypothyroidism (0.7%) with no significant difference between the two groups (p=0.78).

The most common diagnoses overall (both groups) were psoriasis (26.1%), pityriasis capitis (11.7%) and infections (11.7%) (**Table 2**).

Table 2 Diagnosis.

Diagnosis	With PSC	Without PSC	Total
Psoriasis	51 (19.0%)	87 (33.5%)	138 (26.1%)
Autoimmune vesiculobullous disorders	4 (1.5%)	49 (18.8%)	53 (10.0%)
Autoimmune connective tissue disorders	8 (3.0%)	28 (10.8%)	36 (6.8%)
Infections	58 (21.6%)	4 (1.5%)	62 (11.7%)
Tumours	18 (6.7%)	1 (0.4%)	19 (3.6%)
Contact dermatitis	21 (7.8%)	0 (0.0%)	21 (4.0%)
Sensitive scalp	12 (4.5%)	0 (0.0%)	12 (2.3%)
Pityriasis capitis (Dandruff)	62 (23.1%)	0 (0.0%)	62 (11.7%)
Acne keloidalis nuchae	9 (3.4%)	0 (0.0%)	9 (1.7%)
Seborrheic dermatitis	16 (6.0%)	2 (0.8%)	18 (3.4%)
Lichen planus	2 (0.7%)	41 (15.8%)	43 (8.1%)
Vitiligo	5 (1.9%)	48 (18.4%)	53 (10.0%)
Pyogenic granuloma	1 (0.4%)	0 (0.0%)	1 (0.2%)
Pityriasis amiantacea	1 (0.4%)	0 (0.0%)	1 (0.2%)
Total	268 (100.0%)	260 (100.0%)	528 (100.0%)

Pityriasis capitis was seen in 23.1% of the patients in group 1 followed by infections (21.6%), psoriasis (19.0%) and contact dermatitis (7.8%). In 260 patients in group 2, 85 patients (32.69%) were found to have lesions on scalp on clinical examination despite the lack of PSC.

These patients were found to have a diagnosis of psoriasis (49.4%), autoimmune vesiculobullous disorders (23.5%), vitiligo (10.5%), autoimmune connective tissue disorders (8.23%), and varicella (4.70%). Sensitive scalp was diagnosed in only 2.3% patients with winter (8.3%) and sunlight (8.3%) as triggers ($p=0.0001$)

Patients with PSC were found to wash hair more frequently with daily in 29.1% patients and alternate day in 23.1% when compared to 22.7% and 20.8% respectively in group 2 ($p=0.03$). The cleansing agents used for hair wash overall included shampoos (66.9%), soaps (22.2%) and organic agents (11.0%) with no significant difference between the two groups. Use of hair dye was seen in 16.8% of patients with PSC and 15.8% of patients without PSC with no significant difference between the groups.

Dermatology Life Quality Index (DLQI) The DLQI was administered to all 268 patients belonging to the group with PSC. DLQI scores of less than 10 were found in 85.4% of the patients whereas no patients had a score more than 20 (**Figure 2**). The mean DLQI score in all patients was 5.49.

Discussion

Scalp dermatoses are common complaints in daily clinical practice. Despite the frequent and varied involvement of scalp in several primary as well as systemic diseases, there is paucity of studies focused on scalp disorders alone.

In our study, 268 patients (Group 1) had come

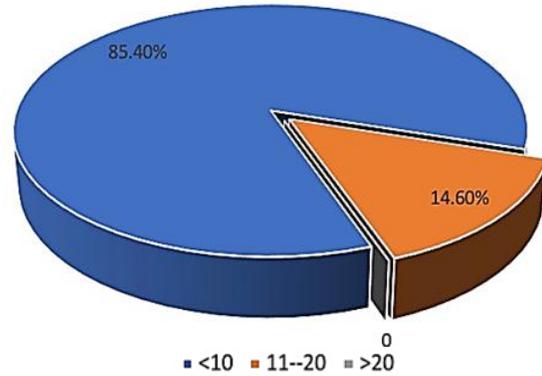


Figure 2 DLQI

with PSC while 260 patients (Group 2) who had no PSC were screened considering that they were diagnosed with disorders where scalp involvement was expected.

Scalp dermatoses were found to be more common in the age group 15 to 30 years in both groups with a decreasing incidence of scalp dermatoses with advancing age ($p=0.001$). Aravamuthan *et al.* noted a similar decreasing trend in scalp dermatoses with age in their study.⁵ The incidence of scalp dermatoses is said to be more common in males than in females with a male to female ratio of 1.8:1.^{6,7} A similar male preponderance (54.5%), though not statistically significant was seen in this study ($p=0.068$). The increased incidence of exposed scalp in androgenic alopecia among men may contribute to dermatoses like hair dye dermatitis and photocontact dermatitis. In our study, housewives (27.7%) were the most commonly affected group overall which was similar to the observations by Pillai *et al.*⁸

Inflammatory dermatoses often cause patients to consult dermatologists early in the course of disease due to the distressing nature of symptoms, whereas tumours may often go unnoticed for years due to lack of visibility on scalp and symptoms. Majority of patients in both groups were found to have symptoms for less than ten weeks prior to seeking medical care.

This is probably due to the high proportion of inflammatory diseases in our patients. Though not statistically significant, those with PSC sought treatment earlier than those in the second group ($p=0.11$).

Among the 268 patients who had PSC, 196 patients (73.1%) had complaints which were exclusive to scalp. The remaining 72 patients in group 1 had lesions on the body in addition to the scalp. This reiterates the need for a complete cutaneous examination even in patients who only report scalp lesions. The scalp is often the first site of involvement in diseases like psoriasis and pemphigus.⁹ This early involvement can serve as an indicator of an underlying substantial disease in patients. The scalp was the initial site of involvement in 94.8% of our patients with PSC in contrast to the second group, where patients noticed initial lesions on lower limbs (34.2%), upper limbs (28.5%) and face (8.0%).

The common symptoms reported were itching (60.8%), flaking (24.3%), pain (13.4%) and burning sensation (6.7%). Itching was the most common symptom noted in similar studies on scalp dermatoses.^{5,8} Some patients (15.7%) in our study also had asymptomatic lesions on the scalp.

In this study, total of 353 subjects (66.85%) had lesions on the scalp. Examination findings revealed scaling (27.7%), patches (13.2%), erythema (12.5%) and plaques (11.6%). Those patients who were diagnosed to have sensitive scalp (1.7%) had no lesions on scalp. The frontal area of the scalp was the most common primary site involved in patients in first (48.5%) and second group (43.5%). Multiple areas were found to be involved in 33.9% of the patients with lesions on the scalp.

Inflammatory disorders like psoriasis (26.1%) and pityriasis capitis (11.7%) (**Figure 3**) were



Figure 3 Pityriasis capitis

the most common cause of scalp dermatoses in our study followed by infections (11.7%).

In group 2, 85 patients were found to have lesions over scalp along with skin lesions despite lack of PSC. These lesions on scalp mostly comprised psoriasis (49.4%), autoimmune vesiculobullous disorders (23.5%), vitiligo (10.5%), autoimmune connective tissue disorders (8.23%), and varicella (4.70%). By comparing the frequency of cases in both groups, it was seen that screening of some disorders are necessary despite lack of primary complaints on scalp. This was significant in diseases like chronic plaque psoriasis, where even though 69 patients had no PSC, 35 of them had lesions on scalp examination. Similar findings were also seen in patients with pemphigus vulgaris (PV), pemphigus foliaceus (PF), discoid lupus erythematosus (DLE), scleroderma, varicella and vitiligo in our study.

Patients with psoriasis presented with various forms of the disease including chronic plaque psoriasis (19.1%), scalp psoriasis (3.6%), pustular psoriasis (2.3%) and guttate psoriasis (1.1%). Scalp involvement was seen primarily in chronic plaque psoriasis and scalp psoriasis whereas few patients of pustular psoriasis and

guttate psoriasis showed scalp lesions on examination. There was a high prevalence of pityriasis capitis sicca (11.7%) and seborrheic dermatitis (3.4%) in our study. The adult form of seborrheic dermatitis usually presents first around puberty, correlating with the increase in cutaneous lipids due to the influence of androgens.¹⁰ This could explain the high prevalence as our study population mostly comprised young adults. Contact dermatitis including hair dye dermatitis, kumkum dermatitis and photocontact dermatitis was identified in 4% of our study population with most patients showing lesions on face, neck and ears in addition to the scalp. Autoimmune vesiculobullous disorders included PV (4.4%), PF (1.1%), bullous pemphigoid (BP) (4.4%) and pemphigus vegetans (0.2%). Scalp involvement was noted more commonly with PV and PF and was less likely in BP and pemphigus vegetans. The scalp is reported to be the first location in 9 to 15% of patients with pemphigus.¹¹ We observed only one patient with scalp as the initial site in PV whereas no patients had scalp as the sole site of involvement throughout the course of their pemphigus. DLE (3.4%), systemic lupus erythematosus (2.1%), dermatomyositis (0.4%) and scleroderma (0.9%) were the autoimmune connective tissue disorders diagnosed in our patients. Among the

two patients with dermatomyositis in this study, one of them was found to have erythema and scaling on scalp. Two out of five patients with generalized scleroderma were found to have salt and pepper pattern of pigmentation on the scalp. Assessment of our patients revealed folliculitis of scalp (5.5%), pediculosis capitis (3.4%), verruca vulgaris (1.5%), varicella (0.8%) and herpes zoster (0.6%) as the common infections affecting scalp. Patients with varicella presented with pustules on scalp while all patients with lesions of herpes zoster were of the herpes zoster ophthalmicus type. Tumors on scalp were found in 3.6% of patients including basal cell carcinoma (BCC) (0.4%) (**Figure 4**), actinic keratosis (0.4%), nevus sebaceous (0.4%) (**Figure 5**), sebaceous cysts (0.8%) and dermoid cysts (0.2%). Although most studies have observed only benign neoplasms, we observed two cases of ulcerative type BCC confirmed by histopathology. Rare dermatoses with scalp involvement identified in this study included pseudolymphoma, dermoid cyst, nevus comedonicus (**Figure 6**) and pyogenic granuloma. Scalp sensitivity is characterized by the presence of pricking, burning or tingling sensation in scalp and is considered to be an extension of the concept of sensitive skin.¹² An epidemiological study in the French population revealed an incidence of 44.22% and no link



Figure 4 Basal cell carcinoma.



Figure 5 Nevus sebaceous.



Figure 6 Nevus comedonicus.

between scalp sensitivity and a specific scalp disease. However, it was noted that people with scalp sensitivity suffered more frequently from a scalp disease or hair loss.¹³ It was proposed that thinner stratum corneum (SC) leads to increased permeability of irritant chemicals leading to SSS. However, most studies on scalp have revealed that scalp has a thicker SC when compared to most other sites of the body.¹⁴ Our study could identify only 12 patients (2.3%) with sensitive scalp where majority of the patients were female (8 out of 12) and above the age of 50 years. Analysis of triggers in these patients revealed a significant association with winter and sunlight exposure which was in concordance with previously published studies¹¹ ($p=0.001$).

Hair care habits of our patients were recorded to assess any relationship between the frequency of hair washes and scalp dermatoses. Patients with PSC were found to wash hair more frequently with 29.1% washing daily and 23.1% of the patients on alternate day. This could be due to belief that frequent washing may clear the scaling or crusting associated with the inflammatory conditions on scalp. The cleansing agents used for hair wash included shampoos (66.9%), soaps (22.2%) and organic agents like soap nut powder (11.0%) with no significant difference in the incidence of scalp lesions among the various groups.

It is often accepted that skin diseases do not represent a health problem compared to other chronic diseases but it is becoming increasingly clear that these diseases considerably affect patient QoL. DLQI was administered to all patients in group 1. A total DLQI score of less than 10 was seen in 85.4%, whereas no patients had a score more than 20. The mean DLQI score in all patients recorded was 5.49. The mean DLQI score for psoriasis in our study (6.35) was lower than other published studies¹⁵ where the

mean DLQI score was 11.59. This may be due to the fact that lesions on all parts of the body were considered in their study, whereas patients in our study mostly had lesions exclusive to the scalp. The mean DLQI in pityriasis capitis in our study was found to be 4.82 whereas it was 4.62 in seborrheic dermatitis. The lowest mean DLQI score (0.5) was noted in patients with seborrheic keratosis and nevus sebaceous. The relative lack of visibility of these lesions due to hair and the asymptomatic nature probably contribute to the low DLQI scores associated with these lesions.

Conclusion

Many patients attend hospital with primary scalp complaints while some may present with common dermatoses which reveal scalp lesions only on examination. The QoL is often not impacted in patients with PSC. However, if the scalp is involved along with skin on other parts of the body in diseases like psoriasis and seborrheic dermatitis, there is an impact on QoL. These observations make it imperative that the examination of the scalp should be mandatory in most patients attending the dermatology department.

References

1. Elewski B. Clinical Diagnosis of Common Scalp Disorders. *J Invest Dermatol Symp Proc*. 2005;**10(3)**:190–3.
2. Grimalt R. A Practical Guide to Scalp Disorders. *J Invest Dermatol Symp Proc*. 2007;**12(2)**:10–4.
3. Chen S, Yeung J, Chren M. Scalpdex: A Quality-of-Life Instrument for Scalp Dermatitis. *Arch Dermatol*. 2002;**138(6)**:803-7.
4. Finlay A, Khan G. Dermatology Life Quality Index (DLQI) - a simple practical measure for routine clinical use. *Clin Exp Dermatol*. 1994;**19(3)**:210–6.
5. Aravamuthan R, Vadivelu S, Arumugam S *et al*. An overview of scalp dermatoses in a tertiary care institute. *Int J Res Dermatol*. 2020;**6(3)**:304-12.

6. Kulthanan K, Jiamton S, Araya M. Clinical characteristics and quality of life of seborrheic dermatitis patients in a tropical country. *Indian J Dermatol*. 2015;**60(5)**:519.
7. van de Kerkhof P, Franssen M. Psoriasis of the Scalp: Diagnosis and Management. *Am J Clin Dermatol*. 2001;**2(3)**:159–65.
8. Pillai J, Okade R. A clinical spectrum of scalp dermatoses in adults presenting to a tertiary referral care centre. *Int J Biol Med Res*. 2014;**5(4)**:4434–9.
9. Salmanpour R, Shahkar H, Namazi M, Rahman-Shenas M. Epidemiology of pemphigus in south-western Iran: A 10-year retrospective study (1991-2000). *Int J Dermatol*. 2006;**45(2)**:103–5.
10. Rosso J. Adult Seborrheic Dermatitis. A Status Report on Practical Topical Management. *Clin Aest Derm*. 2011;**4(5)**:32-38.
11. Salmanpour R, Shahkar H, Namazi M, Rahman-Shenas M. Epidemiology of pemphigus in south-western Iran: A 10-year retrospective study (1991-2000). *Int J Dermatol*. 2006;**45(2)**:103–5.
12. Maibach H, Lev-Tov H. The Sensitive Skin Syndrome. *Indian J Dermatol*. 2012;**57(6)**:419-23.
13. Misery L, Sibaud V, Ambronati M, Macy G, Boussetta S, Taieb C. Sensitive scalp: does this condition exist? An epidemiological study. *Contact Dermatitis*. 2008;**58(4)**:234–8.
14. Ya-Xian Z, Suetake T, Tagami H. Number of cell layers of the stratum corneum in normal skin - relationship to the anatomical location on the body, age, sex and physical parameters. *Arch Dermatol Res*. 1999;**291(10)**:555–9.
15. Çakmur H, Derviş E. The relationship between quality of life and the severity of psoriasis in Turkey. *Eur J Dermatol*. 2015;**25(2)**:169–76.