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Original Research Article

Pattern of skin disorders in hilly district of Pauri Garhwal with their dermoscopic findings: an epidemiological study

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ABSTRACT

Background: The pattern of skin disorders is largely affected by climate, geography, occupation, socio-economic status, nutrition, genetics and habits of the community. Nowadays, dermoscope is being increasingly used as a non-invasive aid in diagnosis of various skin disorders. Objective of the study was to study the etiology, distribution and dermoscopic findings of various skin disorders in 5 remote villages of hilly district of Pauri Garhwal, Uttarakhand over a period of 1 month (April 2021).
Methods: The study was conducted as a weekly OPD in 5 villages of Hilly district of Pauri over a period of 1 month with free consultation and medications. Details of patients, their complaints, clinical diagnosis and dermoscopic findings were recorded.
Results: Overall, allergic/irritant dermatitis were found to be most common (30%) followed by infective disorders (27.25%), photodermatitis (20.2%), inflammatory disorders (4.3%), miscellaneous disorders (LSC, stasis dermatitis, pityriasis rosea, others) up to 9.5% and viral exanthematous rash possibly COVID-19 associated in 8.62% cases. Most common dermoscopic finding of allergic/irritant dermatitis were red dots (92%), in photodermatitis were brown dots (82.09%) and viral exanthem was diffuse erythema (100%).
Conclusions: Hilly areas contribute to a large burden of dermatological disorders which needs to be catered too. With the help of this knowledge, we can plan appropriate range of health services to meet the patient's needs in hilly regions.

Keywords: Hilly district Pauri, Skin disorders in villages, Dermoscopy, Viral exanthem COVID-19

INTRODUCTION

The pattern of skin morbidity in an area largely depends on its climate and geography. Prevalence of skin disorders is determined by socio-economic status, nutrition, occupation, genetics and habits of the community.[1] The prevalence of skin diseases in general population varies from 6.3% to 11.2%.[1] In developing countries, poor hygiene, lack of basic amenities and overcrowding also plays a major role in affecting the occurrence of various skin disorders.[1]

Garhwal is primarily a hilly region situated in Northwest India in the state of Uttarakhand. Pauri district falls under Garhwal which has an area of about 5329 km square with a total population of 687,271 in 2011 of which 83.60% is rural (574,568) and 16.4% (112,703) is urban.[1] District density was 128 people per sq km. Sex ratio is 1103 females per 1000 males.[2] There are 3,447 villages, 1212-gram panchayats, 15 blocks and 13 Tehsils and 3 major urban centres of Pauri town, Srinagar and Kotdwara in Pauri district.[2] It is important to understand the terrain

due to different ethnic, racial conditions and culture of the population which affect the pattern of skin disorders.[1]

Knowledge about the distribution and magnitude of skin diseases will help in understanding further health needs of the population of hilly regions, to provide adequate health services in remote hilly regions.[1] However, there are very few studies on the epidemiology of skin diseases from remote villages of Garhwal. The objective of this study was to study the pattern and distribution of skin diseases in 5 remote villages of Pauri District (hilly region), their etiology and correlation with dermoscopic findings over a time period of 1 month.

METHODS

This is an observational type of study which was conducted at district hospital Pauri, Garhwal Uttarakhand, India. In this study 5 remote villages of Pauri district namely Partisan, Bahedakhal, Kaljikhal, Satpuli and Parsundakhal were visited weekly in a mobile health van over a period of 1 month (2nd April 2021- 2nd May 2021) and regular health camps were conducted. OPDs were conducted in the health van during 10am-2pm and free consultation and medications were provided for all illnesses. No camps were conducted on Sundays. The selection criteria for inclusion in the study was- all patients with dermatological complaints attending the OPD. Patients of all age groups, gender were included in the study. Patients having illnesses not related to skin/hair/nail were excluded from the study. Details of patients like name, age, sex, occupation, place, co-morbidities, chief complaints, duration of illness and brief history were noted. Physical examination of the patients and dermoscopic evaluation (Dermoscope model- DermLite DL4-3Gen) was done of the lesions. A fresh cling film was kept every time at the surface while examining all lesions keeping in mind the rising cases of COVID19. Wherever needed, wet dermoscopy using alcohol rub/hand sanitiser as the interface medium was done. Clinical diagnosis was made by the observer. Appropriate pictures were taken using phone camera (Model name OnePlus7, camera details 48 megapixel (f/1.7,1.6-micron) +5 megapixel (f/2.4, 1.12 micron)) of the observer wherever necessary. Proper informed written consent was taken from every patient for all the documentation and photographic records. Statistical analysis of the data was done by calculation of p-value for the dermoscopic findings using the chi-square test. Final analysis was done using SPSS version no. 24. The funding of these health camps was done by world bank. The ethical approval has been submitted to ethics committee of concerned institution for clearance.

RESULTS

A total of 800 patients (all age groups) presenting with various dermatological diseases from 5 different villages were included in the study. Diseases were classified according to their etiology (Figure 1). The most common were allergic/irritant dermatitis (30% cases) followed by infective disorders (27.25%), photodermatitis (20.2%), miscellaneous disorders (9.5%), viral exanthem (8.62%) and lastly inflammatory disorders (4.30%). Amongst the 5 villages studied, most common skin disorders observed in Partisan were of infective etiology (31.4%), in Bahedakhal were allergic/irritant dermatitis (39.5%), Kaljikhal were allergic/irritant 30.8%, Satpuli were infective disorders 33.6% and Parsundakhal were allergic/irritant dermatitis 33.5% (Figure 2). All the diagnosis made by the observer were clinical. Cases included under allergic/irritant dermatitis were atopic dermatitis, chronic hand eczema, nummular eczema, chronic urticaria, contact dermatitis, ABCD, papular urticaria; infective disorders were tinea infections, scabies, pityriasis versicolor, vaginal candidiasis, furuncle, abscess, molluscum contagiosum and Hansen's disease; photodermatitis included PMLE and photoallergic dermatitis; miscellaneous disorders observed were lichen simplex chronicus, stasis dermatitis, senile pruritus, pityriasis rosea, post-herpetic neuralgia, insect bite reaction, fissured heel, alopecia areata and keloid; viral exanthem (Figure 3A) included patients having symptoms suggestive of fever, sore throat, running nose, headache, body ache and with a rash or RTPCR confirmed COVID-19 cases having skin rash; inflammatory disorders observed were psoriasis and lichen planus.

Dermoscopic assessment of lesions

In lesions of allergic/irritant dermatitis following findings were seen: Red dots (92%), pigmentary globules (82.5%), pinkish-yellow background (71.25%), crusts (37.9%), white scales (30%), yellow clods (29.1%). Photodermatitis showed brown dots (82.09%), red dots (70.3%), perifollicular pigmentary dots (40.70%), linear bands (22.83%). In infective disorders, tinea lesions (Figure 4) showed diffuse erythema (100%), perifollicular scaling (90.4%), broken hair (39.7%), brown dots (30.1%), follicular micropustules (5.4%), morse-code hair (2.7%); scabies lesions showed triangle sign (27.4%); Pityriasis versicolor lesions showed altered pigment network (100%), scaling (77.7%), contrast halo ring (38.8%). In inflammatory dermatosis, psoriasis lesions (Figure 5) showed red dots (83.3%), silvery scales (83.3%), erythematous background (66.6%), pigmentary changes (50%), pearly white structures (16.6%); Lichen planus lesions showed pigmentary changes (100%), violaceous background hue (80%), Wickhams's striae (80%), pearly white structures (40%). In viral exanthem (Figure 3 B and C), findings observed were diffuse erythema (100%), red globules (75.3%), yellow globules (14.4%). Among the miscellaneous cases, lichen simplex chronicus (Figure 6) showed white structureless area (100%), telangiectasias (63.6%), comedo-like openings (18.1%); stasis dermatitis showed glomerular-like vessels (80%), reddish-brown globules (60%), yellow crusts (40%); pityriasis rosea showed peripheral collarette scale

(81.8%), yellow centre with peripheral reddish background (39.3%), red dots (36.3%), scales (21.2%).

The p calculated for the most common dermoscopic findings observed which was statistically analysed by SPSS version no. 24. These were, red dots: chi-square value 166.9 ($p<0.05$), Brown clods: chi-square value 296 ($p<0.05$), scaling: chi square value 27.48 ($p<0.05$) (Table 2). The study is significant since p value is less than 0.05. No red dots were seen in infective etiology cases, no brown clods were seen in viral exanthem cases and no scaling was observed in viral exanthem cases and photodermatitis cases. Hence these were not included in the p value calculation by chi-square test.

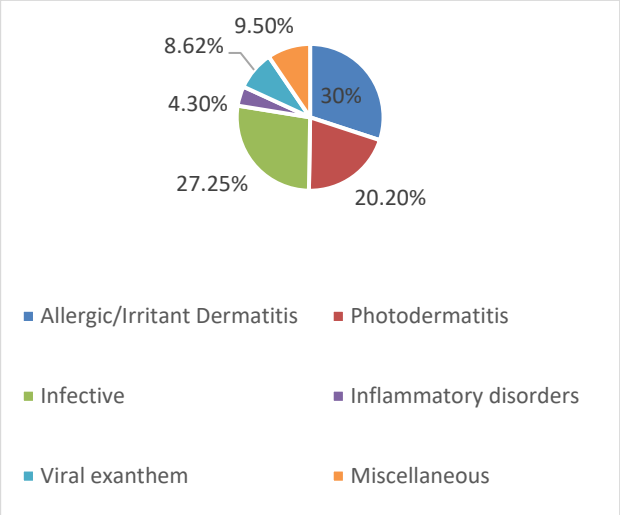

Figure 1: Etiological classification of total cases (800) observed.

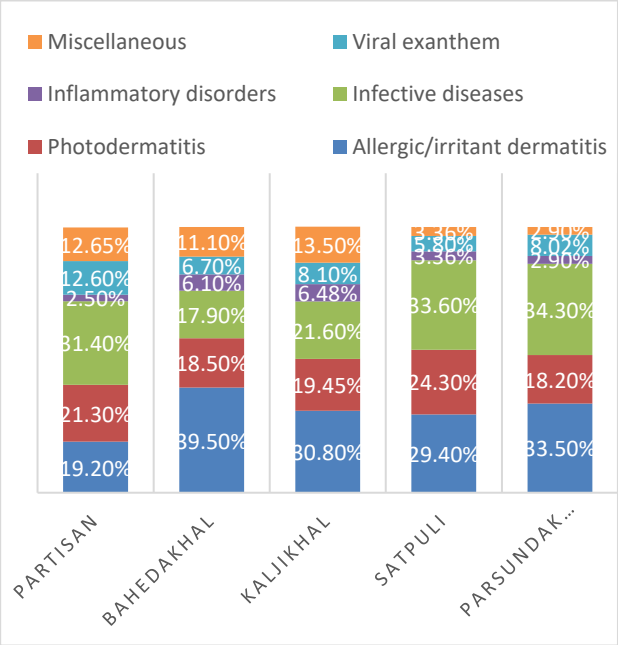

Figure 2: Dermatological disorders of various etiologies seen in 5 remote villages of Pauri district.

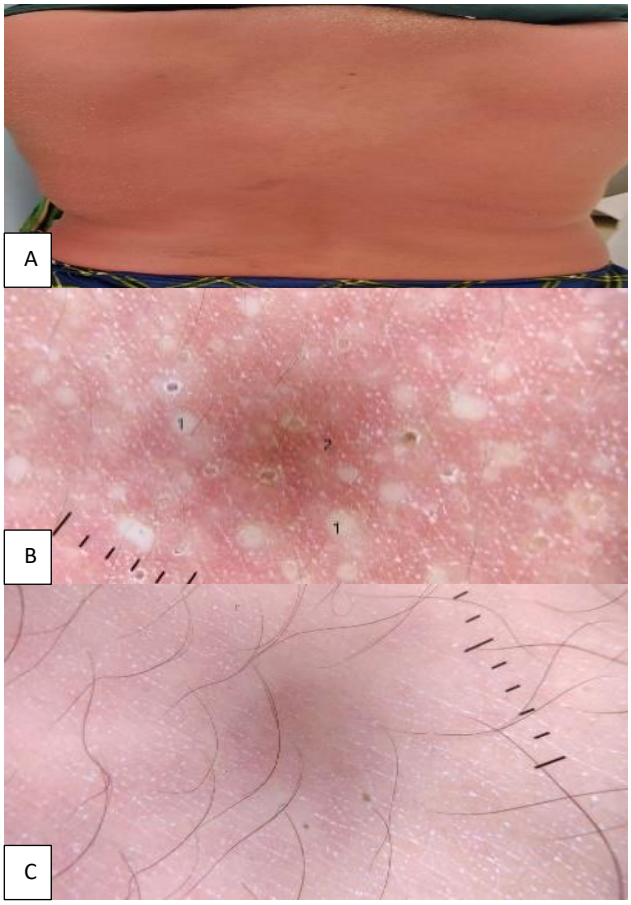

Figure 3: (A) Viral exanthem (Cutaneous manifestation of COVID-19). (B) Dermoscopic picture showing erythematous background (2) with yellow globules (1), features suggestive of viral exanthematous, possibly COVID-19. (Dermlite DL4-3Gen, contact mode, no interface medium used, magnification 10X). (C) Dermoscopic picture showing diffuse erythema suggestive of exanthematous rash possibly due to COVID19. (Dermlite DL4-3Gen, contact mode, no interface medium used, magnification 10X).

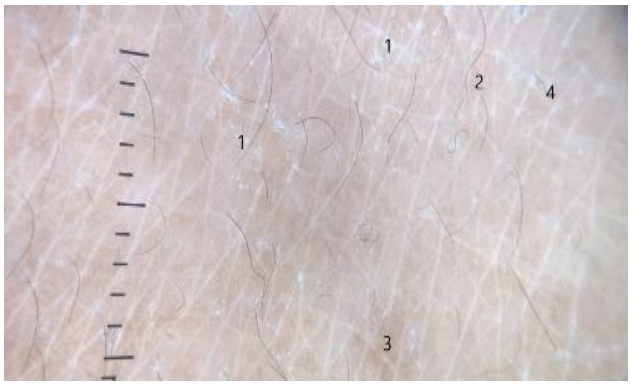

Figure 4: Dermoscopic image of tinea corporis showing perifollicular scaling (1) with mild erythema at few places (2), brown dots (3) and broken hair (4). (Dermlite DL4-3Gen, contact mode, no interface medium used, magnification 10X).

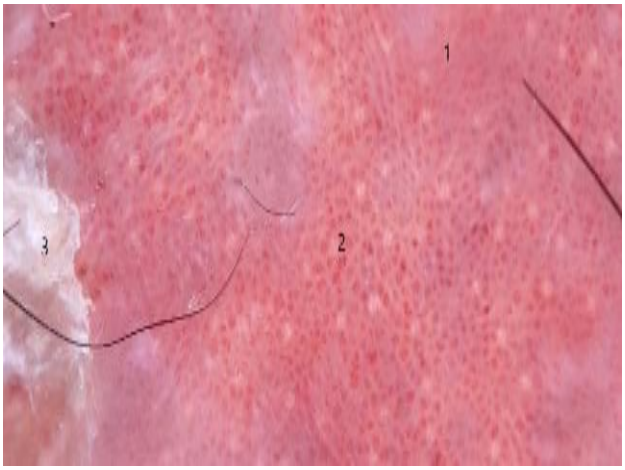

Figure 5: Dermoscopic image shows erythematous background (1), regular red dots (2) and thick silvery scaling (3) suggestive of psoriasis. (Dermlite DL4-3Gen, contact mode, alcohol rub was used as the interface medium after scraping off the thick scales with a slide, magnification 10X).

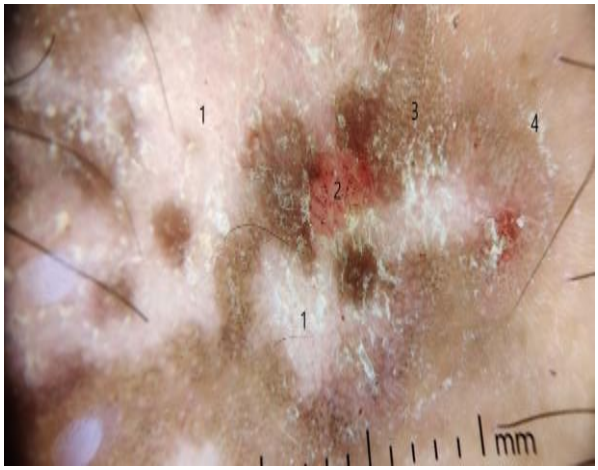

Figure 6: Dermoscopic image showing white structureless area (1), haemorrhagic areas with telangiectasias (2), scaling (4) and few comedo-like openings (3), suggestive of Lichen simplex chronicus (LSC). (Dermlite DL4-3Gen, contact mode, alcohol rub was used as the interface medium, magnification 10X).

Table 1: Data collected.

Etiology	Partisan	Bahedakhal	Kaljikhal	Satpuli	Parsundakhal	Total, n (%)
Allergic/Irritant	38	64	57	35	46	240 (30)
Photodermatitis	42	30	36	29	25	162 (20.2)
Infective	62	29	40	40	47	218 (27.25)
Inflammatory	5	10	12	4	4	35 (4.3)
Viral exanthem	25	11	15	7	11	69 (8.62)
Miscellaneous	25	18	25	4	4	76 (9.5)
Total	197	162	185	119	137	800

Table 2: P value calculation of dermoscopic findings.

	Present	Absent	Total	Chi square value
Red dots				
Allergic/irritant dermatitis	221	19	40	166.9 ($p<0.05$)
Photodermatitis	114	48	162	
Inflammatory	25	10	35	
Viral exanthem	52	17	69	
Miscellaneous	12	64	76	
Total	424	158	582	
Brown clods				
Allergic/irritant	198	42	240	296 ($p<0.05$)
Photodermatitis	133	29	162	
Infective	40	178	218	
Inflammatory	15	20	35	
Miscellaneous	9	67	76	
Total	395	336	731	
Scaling				
Allergic/irritant	72	168	240	27.48 ($p<0.05$)
Infective	80	138	218	
Inflammatory	25	10	35	
Miscellaneous	18	58	76	
Total	195	384	579	

DISCUSSION

The above results show that hilly regions hold quite a burden of dermatological disorders that need to be catered to. People of these remote villages have very limited access to appropriate medical care. A study from Kumaun region of Uttarakhand found that 58.7% were having noninfective skin diseases while only 27.1% were suffering from infective diseases.[14] A study from north-east also found that incidence of non-infectious disorders was more (58.07%) than infectious dermatological diseases.[15] Eczematous diseases were found to be maximum, 23.1% in a study from Guwahati and 19.9% cases from Haldwani, Uttarakhand.[14,16] This data correlates with the results of our study allergic disorders (30%) were found to be most common followed by infectious (27.25%) and photodermatitis (20.2%). The highest number of cases of allergic and irritant dermatitis can be explained by factors like occupation of people residing in hilly regions which includes farming, fieldwork which includes animal rearing and cow dung handling, daily wage labourers, fruit vendors, butchers, homemakers all of which predispose to various allergens like plants, animal products, raw fruits and vegetables, cement, dust, metals, household detergents and soaps etc.

Among the infective disorders most common were tinea dermatophytosis (9.125%) which correlates with a study from Guwahati.[16] Scabies cases in our study were 7% which correlates with other studies showing less than 10%, 8.9% in a study from Imphal and 9.4% in a study from Mangalore, Karnataka.[1,17,18] Another group of disorders with large number of cases are the infective disorders which can be attributed to poor hygiene, low socio-economic status, lack of awareness, poor nutrition all of which promote infectious skin disorders like tinea, scabies, pityriasis versicolor. Patients to be told about healthy practices like daily bathing, frequent changing of clothes if they sweat a lot, not to share towels etc, clean their beddings and household regularly, frequent handwashing, maintain hygiene (genital) for women suffering vaginal candidiasis. However as compared to plains, the burden of infections like fungal infections was found to be quite less. This can be explained by the difference in weather conditions, warmer climate in plains cause increased sweating, humidity predisposing to fungal infections as opposed to colder climate in hills which lowers the risk. Also, since the population density is less in hills compared to plains there is less overcrowding thus lowering the number of infectious disorder cases compared to plains.

Photodermatitis observed as the third most common group of disorders can be attributed to the greater amount of sun-exposure of people living in hilly regions as compared to people living in plains. At high altitudes due to thinning of atmosphere, the UV radiations penetrate more and cause more skin damage compared to plains. Other factors are people working in the open for long hours (fieldwork, farming etc) and travelling barefoot in the sun for long distances, even for basic needs, due to non-availability of any kind of transport thereby increasing the amount of sun-exposure and thus the chances of photodermatitis disorders. These can be prevented by asking the people to wear full-sleeved clothing and cover the neck with cloth while working in fields.

While the study was being conducted in April 2021, India was hit by a second wave of the COVID-19 pandemic which resulted in increasing number of positive/suspected cases in the latter half of the month, a part of which presented with an exanthematous rash along with other complaints of fever, headache, sore throat, cough, running nose, breathlessness. The rash usually involved trunk, back, sometimes palms with absent/mild itching. Patients were advised to look for any signs of breathlessness and referred to district hospital Pauri in case of any worsening of symptoms. Home isolation, adequate intake of fluids, good diet and proper medication were advised.

Inflammatory disorders showed mostly cases of psoriasis (3.75%) followed by lichen planus (0.625%) which correlated with the data from a study in remote areas of Nepal.[19]

Disorders commonly encountered in our daily dermatology OPDs (in plains, cities) like acne vulgaris, melasma, different kinds of alopecia, actinic keratosis were found almost negligible in these regions. The reason can be attributed to the low socio-economic status, lack of awareness and lack of botherance for cosmetic complaints in the people of these remote villages. Cases of diseases like vitiligo were also minimal. Since this study was a camp-based study so only those patients presented to us who were having symptoms/diseases which were affecting their daily activities or quality of life.

Dermoscopic findings of various etiological disorders correlates with findings of other studies as well.[3,4,7] Dermoscopy findings of COVID-19 patients is a less researched topic and our findings of red papules and yellow globules correlate with findings of Larrondo et al.[8] Many studies have shown evidences of cutaneous manifestations of COVID19 during the pandemic and this region is still being explored.

Limitations

Since the study was conducted in one particular month i.e., April so factors like weather, environmental changes can have an influence on the flare up of certain dermatological disorders like atopic dermatitis, PMLE, ABCD etc since April is the spring season involving pollens grains and crop harvesting. Also, there is increased sun exposure after winters (after March) since winters are extreme in the hilly districts of Pauri involving occasional snowfall.

CONCLUSION

The above data shows that there is a need of a specialist doctor-a dermatologist to cater to the needs of the people living there. The burden of dermatological diseases is quite a lot and should receive the desired attention it needs. People in the hills need to be educated by giving awareness about the various lifestyle changes to reduce the occurrence of various preventable dermatological diseases.

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Conflict of interest: None declared
Ethical approval: The study was approved by the institutional ethics committee

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