

A Hospital Based Study on the Patterns of Photodermatoses in a Rural Population Trichy

M.R. Agni Swetha¹, Jansy R.², Bandhala Rajan M.³, Gopala Krishnan K.⁴

¹Postgraduate, Department of Dermatology, Venereology and Leprology, Trichy SRM Medical College Hospital and Research Centre, Tiruchirapalli, Tamil Nadu, India.

²Senior Resident, Department of Dermatology, Venereology and Leprology, Trichy SRM Medical College Hospital and Research Centre, Tiruchirapalli, Tamil Nadu, India.

³Assistant Professor, Department of Dermatology, Venereology and Leprology, Trichy SRM Medical College Hospital and Research Centre, Tiruchirapalli, Tamil Nadu, India.

⁴Associate Professor and Head of the Department of Dermatology, Venereology and Leprology, Trichy SRM Medical College Hospital and Research Centre, Tiruchirapalli, Tamil Nadu, India

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Corresponding author: Dr. Jansy R

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Abstract

Background: Photodermatoses are a group of disorders that occur due to an abnormal response to ultraviolet radiation (UVR) from the sunlight which has integral role in the pathogenesis of various dermatological disorders. This may broadly be classified as photo-allergic and phototoxic reactions.

Materials and Methods: The present study was an observational hospital-based study and was conducted at Trichy SRM Medical College Hospital and Research Centre, Irungalur from August 2022 – November 2022 in patients with photodermatoses. A total of 30 patients aged more than 12 years with complaints related to any form of photodermatoses were enrolled.

Results: The most common pattern of dermatoses observed was Polymorphous light eruption (PMLE-36.7%), followed by Photosensitive Eczema (PSE- 30%), Phytophotodermatitis (20%), Actinic Lichen Planus (Actinic LP -6.7%). Overall, the prevalence was 53.3 % in females, comprising Scaling (90%), Erythematous plaques (56.7%), Hypopigmented papules (36%), Hypopigmented macules (30%), Hyperpigmented papules (16.7%) and skin coloured papules (10%).

Conclusion: Unawareness about phototoxic medications and inappropriate use of topical native medications lead to secondary dermatitis masking the underlying primary morphology making the diagnosis difficult. Correct diagnosis and appropriate education regarding photoprotection will help in reducing the incidence of photodermatoses. Above all these, sun protection is the very important measure to prevent the sun radiation effects.

Keywords: Actinic Lichen Planus (Actinic LP), Photodermatoses, Photosensitive Eczema (PSE), Phytophotodermatitis Polymorphous light eruption (PMLE), Skin, Sun protection, Ultra Violet Radiation.

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Introduction

Sunlight has a vital influence on the pathogenesis of different skin conditions both directly and indirectly. Photodermatoses is a broad term referring to skin diseases provoked by exposure to ultraviolet radiation (UVR). [1] Photodermatoses is provoked by exposure to specific wavelengths of electromagnetic radiation due the presence of an underlying autoimmune process, a concurrent medication, photo-aggravation, or inherited abnormalities in DNA repair. [2] It was reported that females suffer more than males. [3] The four components of UVR namely Vacuum UVR (10-200 nm), Ultra Violet C (200-290 nm), Ultra Violet B (290-320 nm) and Ultra Violet A (320-400nm) play a major role in causing photo trauma in human populations. [3] Harmful effects of such radiations are more among fair skinned population leading to photodermatoses. [4].

Effects of sunlight exposure on human skin has been classified broadly as photo-allergic and phototoxic reactions. Time of exposure, type of skin, extent of skin exposure, occupation of an individual are the major components determining the intensity of damage caused due to photodermatoses. Melanin, which is seen in higher quantities in those with darker skin, inhibits UVB radiation from penetrating the skin. [5] Photodermatoses are classified into 5 categories viz (1) Idiopathic photodermatoses, including polymorphic light eruption (PMLE), actinic prurigo, hydroa vacciniforme, chronic actinic dermatitis, and solar urticaria. (2) Photodermatoses which are secondary to exogenous agents like psoralens, coal tar, antibiotics, fragrances, sunscreens and those including phototoxic and photoallergic reactions; (3) Photodermatoses secondary to endogenous agents, mainly the porphyrias; (4) Photoexacerbated dermatoses, including

autoimmune disease, infectious conditions, nutritional deficiencies; and 5) Genodermatoses. [6]

Treatment for photodermatoses can be difficult and strict adherence to treatment for a long duration along with lifestyle modifications are required. Photo-protective measures such as sunscreens, protective clothing and window films are helpful but do not completely prevent exacerbations. Antihistamines and topical corticosteroids provide some symptomatic relief. Lehmann and Schwarz [7] suggested that photodermatoses are not life-threatening conditions but can interfere with the quality of life and hence preventive efforts are more important.

Sunscreens are much more effective against UVB than UVA, as such photo-protection also means using appropriate shade and wearing suitable clothing. Patients need to be advised to use a sunscreen with high Sun Protection Factor (SPF).[8] The present study was undertaken to observe the effects and patterns of photodermatoses in a rural population of Trichy area attending OPD of dermatology department of Trichy SRM medical college, a tertiary care hospital and Research centre in Irungalur, Trichy District, Tamil Nadu.

Materials and Methods

This is a cross-sectional observational study and the type of study is prospective and was conducted in patients with photodermatoses attending dermatology OPD and IPD at Trichy SRM Medical College Hospital and Research Centre, Irungalur, Tiruchirapalli. The total sample size of this study was 30. Patients aged more than 12 years and willing to participate were kept as inclusion criteria. Patients with other major dermatological or systemic illness were kept under exclusion criteria. All the pertaining details were recorded in a

Proforma. Clinical photographs of the skin lesions were taken after obtaining patient's consent.

The presence of different patterns of photodermatoses like PMLE, Photosensitive Eczema, Phytophotodermatitis and Actinic Lichen Planus were recorded. The effects of various native medication like neem, turmeric, oils, leaves paste and sun screens used by the patients under study were also recorded.

Statistical Analyses

Data were entered in MS-EXCEL sheet, compiled and analysed. Statistical analysis was carried out using SPSS v26.0.

Categorical variables were expressed in frequency and percentages. Age was expressed in Mean (Standard deviation). Significance of association between the dermatological findings and the demographic variables was tested by chi-square test or Fishers exact test. A p value of <0.05 was considered statistically significant.

Results

In the present study, the most common pattern of dermatoses observed was PMLE, (36.7%) followed by Photosensitive Eczema (30%), Phytophotodermatitis (20%) and Actinic Lichen Planus (6.7%) [Fig-1 A-D]



Figure 1 A - D: Clinical photographs of]. Figure 1A Polymorphous Light Eruption (36.7%), B Photo sensitive Eczema (30%), C Phytophotodermatitis (20%), D Actinic Lichen Planus (6.7%).

Among the different patterns, PMLE occurred in higher frequency 11 (Frequency n=30) followed by PSE (9) and Actinic LP. Photodermatoses were more prevalent in females comprising 53.3%. Among male and female populations, actinic lichen planus was

found to affect equally (50%). Photo Sensitive Eczema was found in 66.7% and 33.3% in females and males respectively. Females had 54.5% of PMLE and males had 45.5%. Phytophotodermatitis was observed equally among males and females(50%) [Fig- 2].

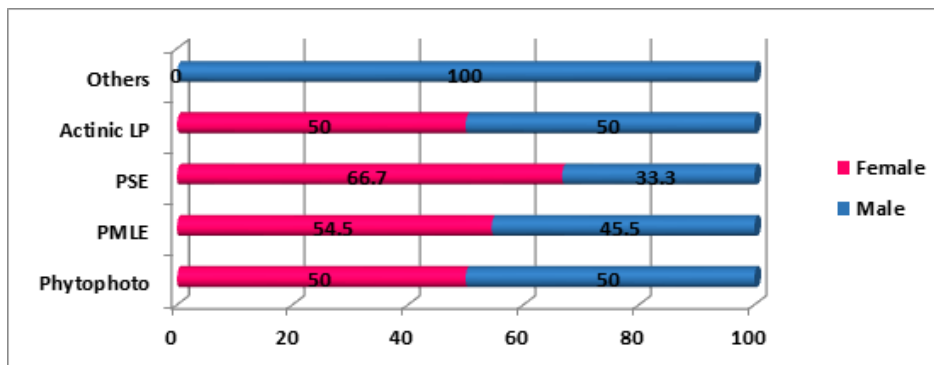


Figure 2: Occurrence of various patterns of photodermatoses among different sex populations

Actinic Lichen Planus - Actinic LP
 PSE - Photo Sensitive Eczema
 PMLE – Polymorphous Light Eruption
 PHYTOPHOTO – Phytophoto Dermatitis

All the patients included in this present study had itching as the primary complaint followed by scaling (90%), Erythematous plaques (56.7%), Hypopigmented papules (36%), Hypopigmented macules (30%), Hyperpigmented papules and Hyperpigmented macules (20%), Hypopigmented plaques (16.7%) and skin

coloured papules (10%). Among 30 patients included in the current study, the highest number of patients (46.7%) belonged to socio-economic status Upper Lower (46.7%) followed by Upper Middle (33.3%), Upper (10%), Lower Middle (6.7%) and Lower (3.3%). [Fig- 3]

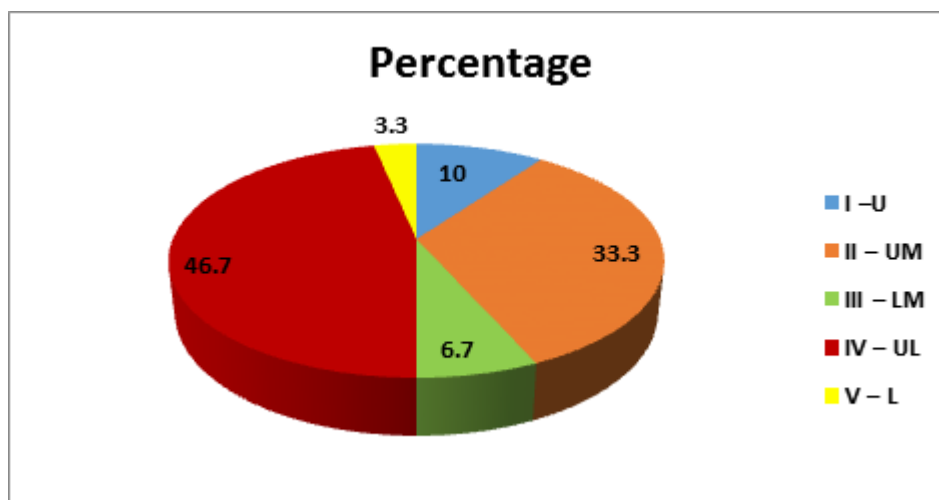


Figure 3: Prevalence of Photodermatoses in relation to socio-economic status

U – Upper;
 UM – Upper middle;

LM - Lower Middle;
UL –Upper Lower;
L – Lower

The farmers and daily wages were more prone to photodermatoses compared to other individuals. The sites of photodermatoses involvement among farmers and daily wages were extensors (85.75%), followed by legs (75%), arms (73.3%), hand (9.2%), feet (66.7%), back (58.8%) and face (57.1% [Table - 1].

Table 1: Occurrence site of Photodermatoses with respect to occupation

Site of lesion	Occupation		P-value *
	Farmers/daily wages	Others	
Face	8(57.1%)	6(42.9%)	0.765
Forearms	15(65.2%)	8(34.8%)	0.290
Arms	11(73.3%)	4(26.7%)	0.136
Legs	6(75%)	2(25%)	0.312
Trunk	9(64.3%)	5(35.7%)	0.654
Back	10(58.8%)	7(41.2%)	0.880
Extensors	6(85.7%)	1(14.3%)	0.113
Hand	9(69.2%)	4(30.8%)	0.367
Feet	2(66.7%)	1(33.3%)	0.804

Variables were tested by Chi-square test or Fishers exact test, *. p value of < 0.05.

The sites involved with unemployed patients were different from the farmers and daily wages. Risk of erythrodermic episodes was high (1.923) among farmers and daily wages than the other individuals. The frequency of photodermatoses occurrence was more in forearms (76.7%), followed by upper back (56.7%), face, trunk and arms (46.7%), hands (43.3%), legs (26.7%), flexures (20%). The least common site was feet (10%). The severity of photodermatoses was more in forearms of the patients (76.7%) followed by back (56.7%), face, arms and trunk (46.7%), hands (43.3%). Legs (26.7%), flexures (20%) and feet (10%) were less affected. The patients affected by sun burns mainly undertook native medications like Neem, Turmeric, oils and paste of multiple leaves

or other topicals like zinc cream. Some of them also used sun glasses, covered clothing, hats and umbrellas which were believed by the patients to have a role in reducing the effect of different patterns of Photodermatoses. Among the many native treatments undertaken by the patients for Photodermatoses, in the present study, paste of leaves of Neem (*Azadirachta indica*), Kuppaimeni (*Acalypha indica*) and Bottle guard (*Lagenaria siceraria*) [Table- 2] gave better relief as felt by majority of the patients included in the study. Sunscreen usage for protection indicated that it is an effective measure that resulted in improvement of lesions at exposure sites. Patients used sunscreen at sites namely hands, face, flexures, legs, forearms, trunk, arms and back [Table- 3].

Table 2: Percentage of native medication used against various Photodermatoses

Pattern	Phytophotodermatitis	PMLE	PSE	Actinic LP	P- value*
Neem	3(50%)	1(9.1%)	2(22.2%)	0(0%)	0.265
Turmeric	5(83.3%)	3(27.3%)	4(44.4%)	1(50%)	0.156
Oil	4(66.7%)	3(27.3%)	3(33.3%)	0(0%)	0.269
Leaves Paste	4(66.7%)	6(54.5%)	5(55.6%)	2(100%)	0.353

For other statistical explanations, refer Table 4, *P = 0.05 (Duncan).

Table 3: Sunscreens usage at different sites of the affected patients

Site of lesion	Sunscreen	P-value*
Face	8(57.1%)	0.153
Forearms	10(43.5%)	0.977
Arms	5(33.5%)	0.153
Legs	5(50%)	0.657
Trunk	5(35.7%)	0.431
Back	3(17.6%)	0.001
Flexures	4(57.1%)	0.400
Hand	9(69.2%)	0.012
Feet	1(33.3%)	0.713

*P = 0.05 (Duncan)

Discussion

The present observational study was conducted on patients with photodermatoses who attended dermatology OPD and IPD at Trichy SRM Medical College Hospital and Research Centre, Irungalur, Tiruchirapalli. Among the different patterns, PMLE occurred in higher frequency 11 (Frequency n=30) as reported earlier by Karthikeyan et al [9] Lehmann and Schwarz [7] reported that the PMLE prevalence was around 10% to 20%. This is followed by PSE and Actinic LP. Nagaraj et al [4] observed that PMLE was the commonest photodermatoses noticed in many of the individuals followed by actinic prurigo and chronic actinic dermatitis. Sharma et al [10] documented that the second commonest photodermatoses is chronic actinic dermatitis. Khoo et al [11] reported second commonest photodermatoses is systemic drug photosensitivity.

In the present observation, photodermatoses was more prevalent in the females and actinic LP was found to affect both sexes equally. PSE and PMLE were more among females varied and Phytophoto Dermatitis was observed equally among female and male patients [Fig-2]. In gender analysis, it was observed that females were affected more than males as reported earlier by Sharma and Sahni [12], Sharma and Basnet [13] and Rhodes et al [14] Kaliaperumal

Karthikeyan et.al reported a female preponderance. [9]

Nagaraj et al. [4] reported females (58%) formed the majority of population affected with photodermatoses to that of males (42%).As per our observations, rural population is more affected than urban population. The farmers and daily wages were more prone to the hazardous effects of the sun compared to other individuals as reported earlier. [4] Sharma et al [15] reported that the skin diseases are mostly depended upon occupation, socioeconomic status and age of the patients. These authors reported that out of 600 female patients, 36% belonged to the age group of 21-30 years, 28% were illiterate and 59% were unskilled workers. 58% of the patients had various noninfectious dermatoses while 42% had various infectious dermatoses.

Based on sites of exposure and nature of work undertaken by the patients, the mainly affected sites were forearms followed by back, face, arms and trunk, hands legs, flexures. The feet were less commonly affected. Nagaraj et al. [4] reported that face and neck were mostly affected since it is placed vertically while sitting, travelling, walking and receive the maximum exposure to sun light. Sharma and Basnet [13] reported the face and neck were more affected followed by upper limbs. The sites involved in unemployed patients differed from the farmers and daily wages.

It was also observed that itching was the foremost prevalent symptom of photodermatoses. Among different patterns, PSE and PMLE occurred in higher frequencies (11- Frequency n=30) and was found to be more in females as reported by Nagaraj et al. [4] PMLE disease was mainly reported in people indulging in outdoor activities like as farmers and laborers. In some observations, higher incidences were noted in housewives probably because of household activities. [16,17] The female to male ratio reported earlier was 1.78:1. [18,19,20,21,22]

In the present study, paste of leaves of Neem (*Azadirachta indica*), Kuppaimeni (*Acalypha indica*) and Bottle guard (*Lagenaria siceraria*) were exhibited better home remedy for Photodermatoses [Table - 2]. Although much information is not available in literature with regard to the ayurvedic and native treatments for Photodermatoses, recently Rajesh Nair [23] and Rashmi and Sathish [24] opined that herbs can help to reduce the discomforts and turmeric, aloe vera and neem gave good relief.

It was also observed that individuals with involvement of two sites in total were more prevalent. The usage of sunscreen significantly reduced the lesions at various sites of patients. Earlier reports by Lehmann and Schwarz [7] also showed topical application of broad-spectrum sunscreen was useful. This predominantly benefits UV-B-induced PMLE.

The consequences of hazardous rays from sunlight is usually in milder forms, but occasionally there can be severe effects on the account of lack of noticing at the right time and using native medications to treat the lesions. People should be taught to take necessary measures to avoid the triggers and be explained about the various routes through which they can come across the same trigger. Sometimes this warrants change of residential places, change of occupation and life style

modifications. Proper sun protection is the soul factor above all. Patients used sunscreen more as a shield against the sun radiation in hand, face and flexures followed by leg, forearms arms, trunk, arms, feet and back [Table - 3].as reported earlier. [13]

Conclusion

This study is similar to many other studies conducted on clinical spectrum of photodermatoses which is very common in tropical countries like India. Lack of proper sun protection, unawareness about phototoxic medications (psoralens, coal tar, antibiotics, fragrances, sunscreens) and inappropriate use of topical native medications lead to secondary dermatitis masking the underlying primary morphology hindering the clues to diagnosis. Proper diagnosis and appropriate education regarding photoprotection will help to reduce the incidence of photodermatoses.

Limitations

The study's overall sample size was 30. Patients could have been followed up and could have recorded the improvement in a subjective manner. Patients with significant systemic or dermatological illnesses were excluded.

Recommendations

Proper diagnosis and appropriate education regarding photoprotection will help to reduce the incidence of photodermatoses.

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