

# Newer Trends of Photodermatoses in Patients Attending Dermatology OPD in a Tertiary Care Center in Rural South India: An Observational Study

Prathyusha Prabhakar <sup>\*1</sup>, Darsan S <sup>2</sup>, Rudra Priya S <sup>3</sup>

<sup>1</sup>Associate Professor, Department of Dermatology, Karuna Medical College, Vilayodi, Palakkad, Kerala, India.

<sup>2</sup>Assistant Professor, Department of Dermatology, Karuna Medical College, Vilayodi, Palakkad, Kerala, 678103, India.

<sup>3</sup>Assistant Professor, Department of Dermatology, Azeezia Medical College, Kollam, Kerala, 691537, India.

\*Corresponding author: Prathyusha Prabhakar; [prathyukiran09@gmail.com](mailto:prathyukiran09@gmail.com)

## Abstract

**Background:** Photodermatoses are skin conditions caused by electromagnetic radiation, which can come from artificial or solar sources including UV, visible light, and infrared (IR) radiation. **Methods:** Our study was conducted in a tertiary care center of Palakkad district in Kerala which is the gateway to Kerala due to the presence of the Palakkad Gap in the Western Ghats. Palakkad has a tropical wet and dry climate. The district being granary of Kerala, farming is a major occupation. According to Lehmann and Schwarz, photodermatoses can affect a person's quality of life but are not life-threatening, so prevention is more crucial. A descriptive cross-sectional study was designed and conducted for 1 year during February 2023 to January 2024. **Results:** A total of 97 patients with photodermatoses attended our OPD during the study period. Prevalence was calculated to be 0.54%. Majority of the patients presented as PMLE (82%) as papules (47%) involving the upper limb (54%). Maximum cases had onset in the month of April, May and June. **Conclusion:** Manual labourers and Farmers who are exposed to direct sunlight >6 hours have high risk of developing photodermatoses. Photodermatoses are skin disorders mostly influenced by the age, socioeconomic status, and occupation of the patients. Standard operations protocol has to be implemented by state labour department regarding work hours of manual labourers with a mandatory 3 hours break in the afternoon from 12pm to 3pm and strict measures to ensure adherence with the same.

**Keywords:** Photodermatoses, PMLE, Work hour modification, Sun burn Kerala, Occupational risk.

## Introduction

Photodermatoses are skin conditions caused by electromagnetic radiation, which can come from artificial or solar sources including UV, visible light, and infrared (IR) radiation (M. Bylaite et al, 2009). According to Lehmann and Schwarz, photodermatoses can affect a person's quality of life but are not life-threatening, so prevention is more crucial (Lehmann P, Schwarz T, 2011). The likely differences between populations with different phototypes that inhabit different geographical areas raise the prospect of a future in which photobiologic knowledge is more globalized (R. Roelandts, 2009). Photodermatoses are classified into 5 categories viz idiopathic photodermatoses, including polymorphic light eruption (PMLE), actinic Prurigo (AP), hydroa vacciniforme (HV), chronic actinic dermatitis (CAD) and solar urticaria (SU); photodermatoses which are secondary to drugs; photodermatoses secondary to metabolic causes, mainly the porphyrias; photoexacerbated dermatosis, including autoimmune disease, infectious conditions, nutritional deficiencies; and Genodermatoses (Yashar SS, Lim HW, 2003).

Studies on the effect of sunlight on darker skin are very scarce in literature (Mehta RV et al, 2004; Sharma VK et al 2013). A clinical research must be carried out because the summer is the main cropping season and additionally, public should receive appropriate

advice regarding the work hours and the need for breaks to prevent photodermatoses.

## Materials and Methodology

A cross-sectional study was designed and conducted in a descriptive method during the period of February 2023 to January 2024 among the patients attending DVL OPD of a tertiary hospital in Palakkad, Kerala, state in southern India. All clinically diagnosed cases of Photodermatoses irrespective of age, sex, nationality or social status were included in our study. Photoexacerbated dermatosis and Photodermatoses secondary to metabolic and Genetic causes were excluded.

After obtaining ethical clearance and written consent, a detailed history taking including demographic data, past history, drug history was obtained from study subjects. By detailed history taking and clinical examination supplemented with dermoscopy whenever necessary was done for making the diagnosis of Photodermatoses. Every patient got the proper care, along with guidance on photoprotection. The gathered data were collated using Microsoft Excel ver. 2016, tabulated, and statistically analyzed.

## Results

A total of 18120 cases attended DVL OPD during this period of one year. We diagnosed 97 patients with photodermatoses features giving a prevalence of 0.54%. Majority of the cases were PMLE (80) (**Figure 1, 2**) followed by 10 cases of chronic Actinic Dermatitis (**Figure 3**). We got eight cases of solar urticaria and 3 cases of Drug induced photodermatoses (Drug). No cases of Actinic Prurigo (AP) and) hydroa vacciniforme (HV) were reported. Our study gives a female preponderance of 62% (**Figure 4**) with a Male: Female sex ratio of 1:1.63. (**Figure 5**)

In our study photodermatoses was more common in the age group of 25 -35 which constitutes 29 (36%) of the total cases. 23 cases (31%) were recorded in the group 35-45. We got only one case in age group <15 and 2 cases in age group 55 to 65 years. No cases were diagnosed in the age group >65 years (**Figure 6**). Among the 97 patients 37% were housewives, 18% office workers, 17% each of farmers and manual labourers and 9% students (**Table 1**). We noted that 44% of the cases developed lesions after sun exposure of 30 minutes to 3 hours. 21% of the people reported 3 hours to 6 hours and 11% had more than 6 hours exposure. Only 16% had short

exposure of 30 minutes while 8% couldn't recall the exposure period (**Figure 7**). Itching was the major presenting complaint for 66% of the cases in our study. 7% and 4% also complained of burning and scaling along with itching respectively. Burning was the presenting symptom for 10%, While 13% were asymptomatic (**Table 2**). April, May and June were the months which reported most number of cases. 35 cases had their onset in January to march. Only eight cases were reported in October to December (**Figure 8**).

Our study had different morphological lesions involving multiple sites. In such cases the most prominent lesion and its site is taken as the morphology of lesion. Majority of the cases presented with papules (47%) followed by photosensitive lichenoid eruptions (19%) and plaques (16%). Macules were seen in 12% and wheals in 6 cases of solar urticaria following sun exposure (**Figure 9, Table 3**). In our study, The predominant site affected in photodermatoses was upper limb (54%), followed by the face (30%). 10% of the cases reported involvement of front and back of neck and 6% had lesions over the V area of chest. None of the cases had lesions over lower limb or back (**Table 4**)

**Table 1: Distribution of occupation**

Occupation	PMLE	CAD	SU	Drugs	AP	HV	Total
Housewife	32	0	3	1	0	0	36 (37%)
Student	12	0	1	0	0	0	9(9%)
Farmer	14	6	0	0	0	0	17(17.5%)
Office Worker	8	0	2	1	0	0	18(18.5%)
Manual Labourer	14	2	0	1	0	0	17(17.5%)
Total	80	8	6	3	0	0	97

**Table 2: Symptoms distribution**

Symptoms	Distribution	Percentage
Itching	64	66%
Itching + Burning	7	7%
Itching + Scaling	4	4%
Burning	10	10%
Asymptomatic	12	13%

**Table 3: Morphology of lesion**

Morphology of lesions	PMLE	CAD	SU	Drugs	AP	HV	Total
Papules	46	0	0	0	0	0	46 (47%)
Plaques	8	7	0	0	0	0	15(16%)
PLE	14	1	0	3	0	0	18(19%)
Wheals	0	0	6	0	0	0	6(6%)
Macules	12	0	0	0	0	0	12(12%)
Total	80	8	6	3	0	0	

**Table 4: Affected site**

Affected Sites	PMLE	CAD	SU	Drug	AP	HV	Total
Face	22	7	0	0	0	0	29(30%)
Neck	6	1	2	1	0	0	10(10%)
V Area of Chest	4	0	2	0	0	0	6(6%)
Upper Limb	48	0	2	2	0	0	52(54%)
Lower Limb	0	0	0	0	0	0	0(0%)
Back	0	0	0	0	0	0	0(0%)
Total	80	8	6	3	0	0	97

**Table 5: Comparison of epidemiology**

Comparison	Our Study 2024	Nagaraju <i>et al.</i> 2018	B.S.Sahoo <i>et al.</i> 2023
Prevalence	0.54%	-	0.61%
M:F	38%:62%	35%:65%	42%:58%
Most common age group	25-35 years, 36%	-	21-30 years, 31%
Most common occupation	Housewife 37%	Housewife 45%	Housewife 30%
Month of onset	April- June, 41%	-	May, 30%

**Table 6: Comparison of morphology**

Morphology	PMLE		CAD		SU		AP	
Comparison	B.S. Sahoo et al	Our Study	B.S. Sahoo et al	Our Study	B.S.Sahoo et al	Our Study	B.S.Sahoo et al	Our Study
Papules	53%	57%	0%	0%	0%	0%	25%	0%
Plaques	29%	10%	55%	88%	0%	0%	0%	0%
PLE	10%	18%	0%	12%	0%	0%	0%	0%
Wheals	0%	0%	45%	0%	100%	100%	0%	0%
Macules	0%	15%	0%	0%	0%	0%	0%	0%

**Figure 1: Photosensitive lichenified eruption (PLE) of polymorphic light eruption (PMLE)****Figure 2: Plane topped erythematous papules coalescing to form plaques in a hypopigmented background in PMLE**



Figure 3: Chronic plaques in the face sparing eyelids in chronic actinic dermatitis

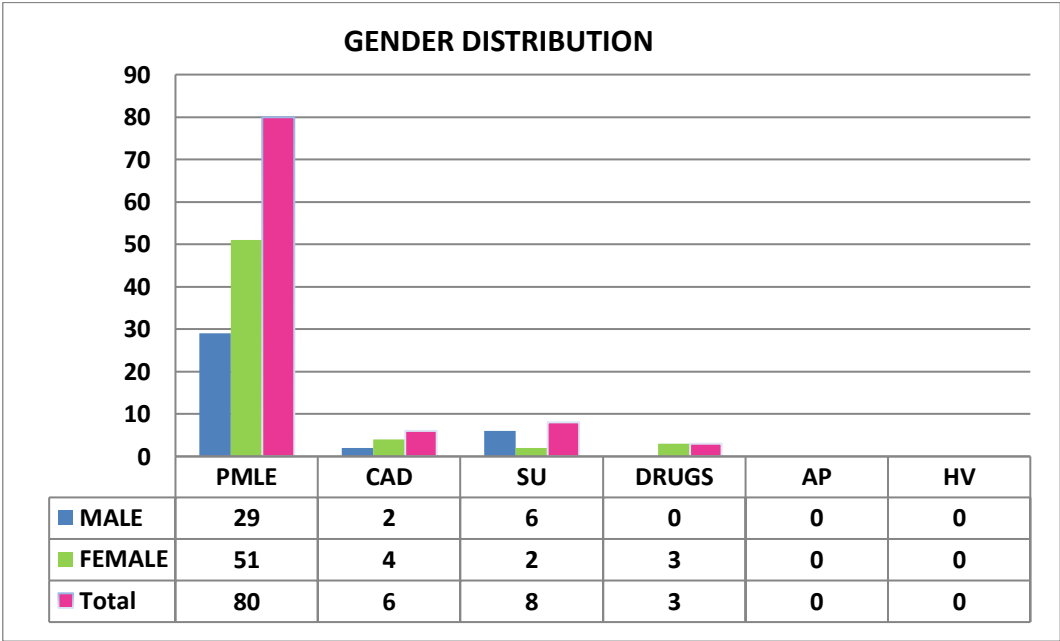


Figure 4: Distribution of Gender

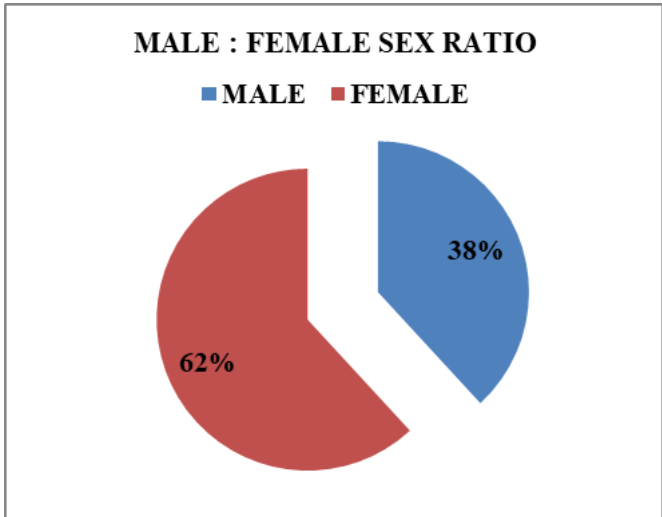


Figure 5: Male: Female sex ratio

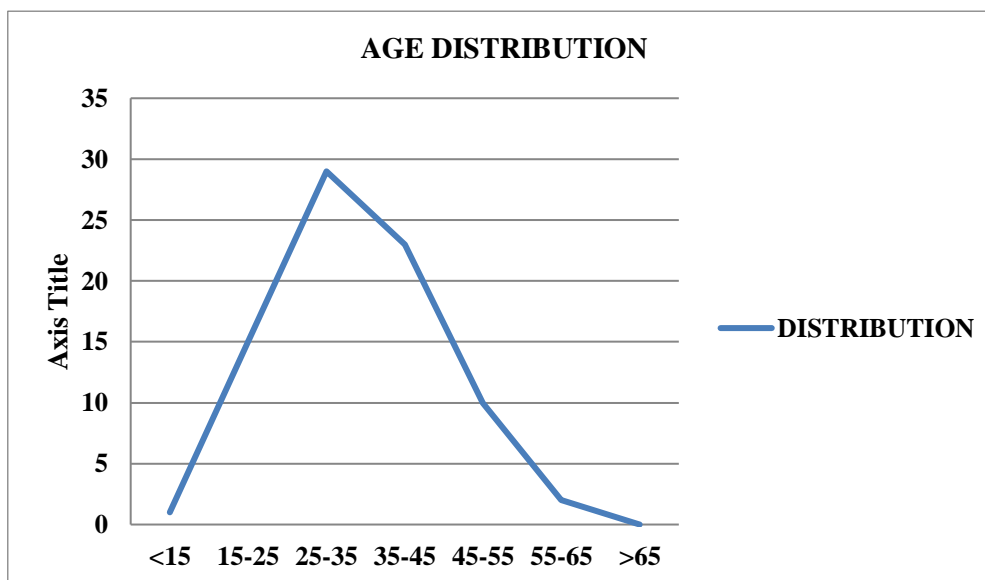


Figure 6: Age Distribution

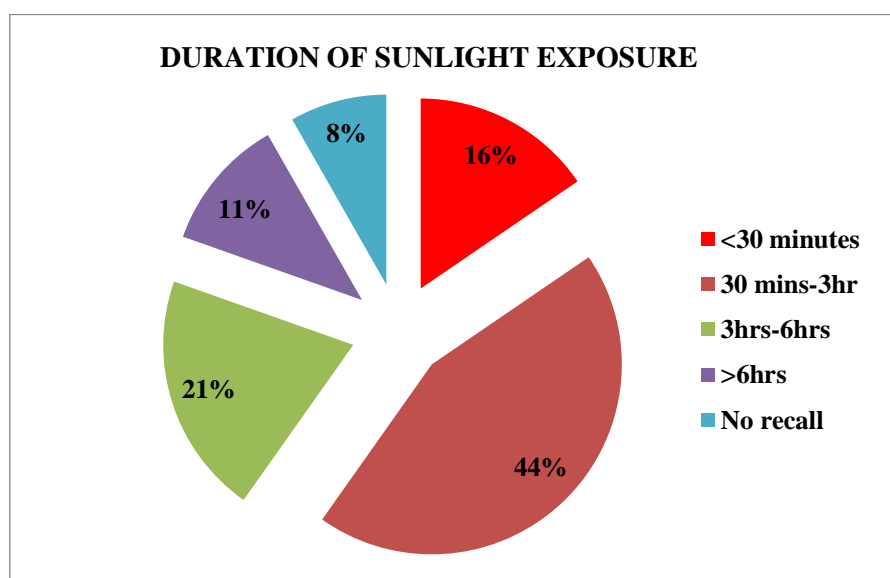


Figure 7: Duration of sun exposure

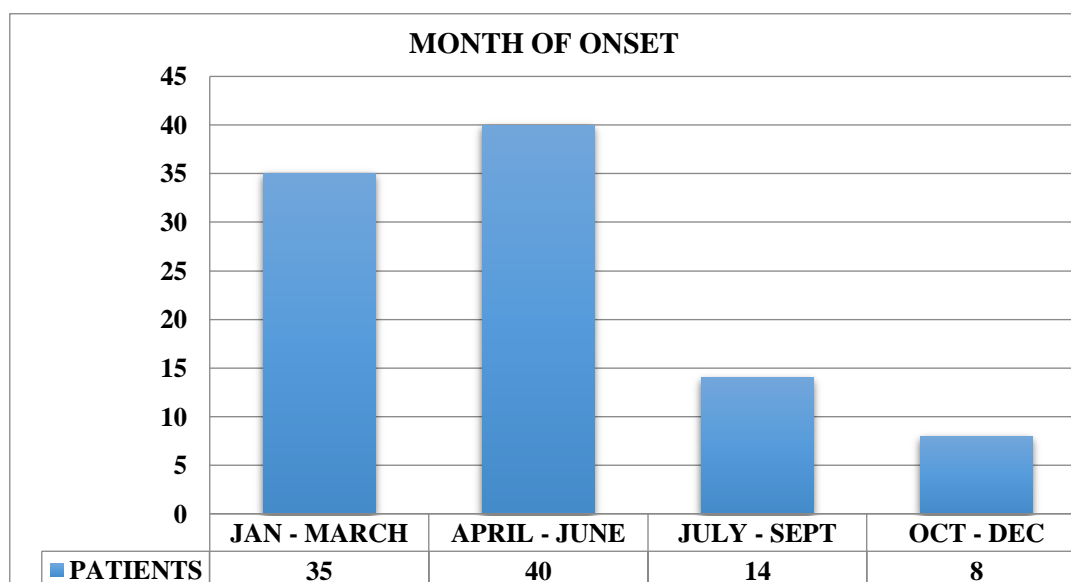


Figure 8: Month of onset

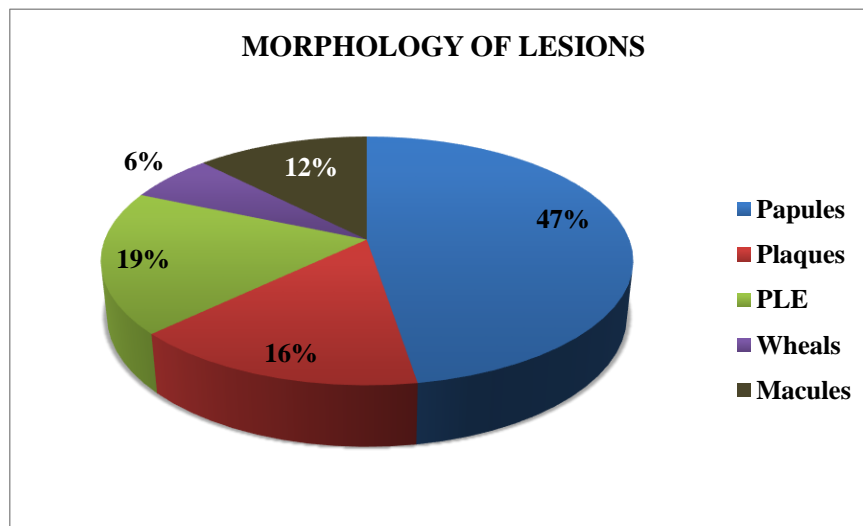


Figure 9: Morphology of lesion

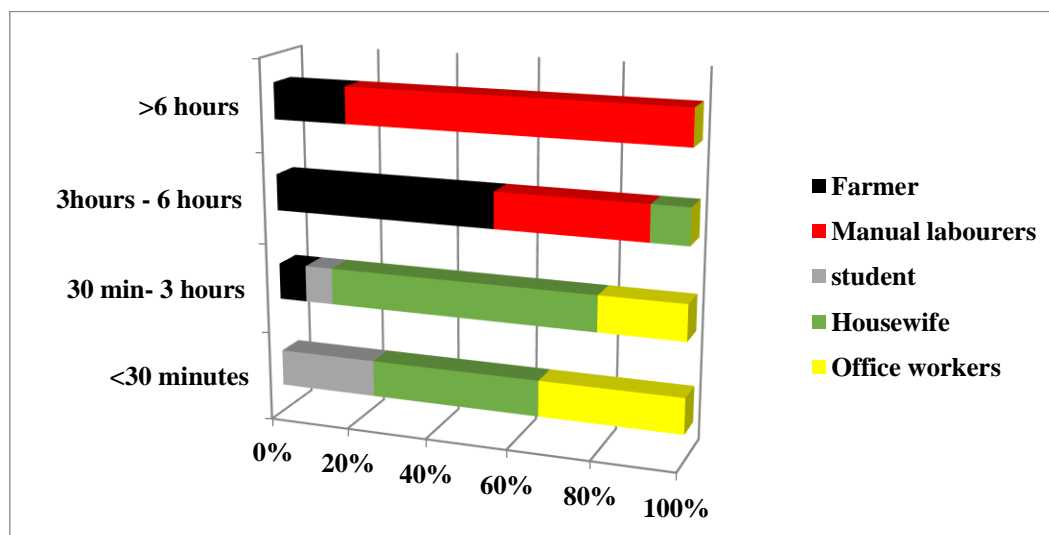


Figure 10: Duration of sunlight exposure and occupation

## Discussion

When ultraviolet (UV) radiation or visible light is exposed to the skin, results in an abnormal cutaneous reaction known as photodermatoses. It includes photosensitive genodermatoses, Photoexacerbated dermatoses, and photodermatoses resulting from exogenous or endogenous causes and idiopathic photodermatoses. The pathophysiology of idiopathic photodermatoses is yet unknown. Polymorphous light eruption (PMLE), actinic Prurigo, hydroa vacciniforme, chronic actinic dermatitis (CAD), and solar urticaria are examples of idiopathic photodermatoses. Despite the greater natural photoprotection provided by melanin, photodermatoses are frequent in the Indian population. The effect of sunlight does depend on the skin's color, type, and kind of melanin.

Observational research was done on individuals with photodermatoses who came to the outpatient dermatology department. A previous study by an author reveals a prevalence of 0.61% which is similar to the prevalence (0.54%) of photodermatoses in our study (Sahoo BS et al, 2023; Nagaraju GV et al, 2018). Females outnumbered the males in our study with a maximum incidence in 25 – 35 age group (Table: 5). These findings were comparable with studies by the previously stated two authors on Indian population (Sahoo BS et al, 2023; Nagaraju GV et al, 2018). Majority of photodermatoses in our study had onset in the months of April to June (41%) which corresponds to the summer season in our region. Temperatures remain moderate throughout the

year, with the exception being March and April; the hottest in the area of study crossing 40°C. This observation was consistent with the studies done by two authors (Nagaraju GV et al, 2018 ; Sharma L, Basnet A, 2008).

The most prevalent photodermatoses observed in our study was polymorphic light eruption (82%), followed by chronic actinic dermatitis (8%) and solar urticaria (6%). Study conducted by another author also reported Polymorphic light eruption (PMLE) as the commonest photodermatoses, affecting 59.7% of patients, followed by CAD (13.8%) (Wadhvani AR et al, 2013). According to an author previously mentioned, PMLE occurred at higher frequencies (55%) and was more common in females (Nagaraju GV et al, 2018). Even though the majority of cases of PMLE disease were reported in outdoor workers and farmers.

In our study Housewives had greater incidences, most likely as a result of their duties at home. Similar findings were observed in two more studies (Verma K et al, 2019; Deshmukh AR et al 2015). Diverse morphologies, such as papules, plaques, and photosensitive lichenoid eruption, have been observed in PMLE. Papules (57%) were the most prevalent morphology, followed by plaques (10%), photosensitive lichenoid eruption (17%) and Macules (15%) (Table 6). Wheals (100%) are the only presentations in all cases of solar urticaria. These findings were similar to a previously stated author's findings on north Indian population (Sahoo BS et al, 2023). According to the patients' jobs and exposure locations, the upper limb (54%), face (30%) and neck (10%) were the most commonly



affected areas. Less often, the V area of chest and trunk were afflicted. The face and neck were primarily impacted because of their vertical positioning and highest exposure to sunlight as reported in one study (Nagaraju GV et al, 2018). The face and neck were most impacted, then the upper limbs according to one study (Sharma L, Basnet A, 2008). Photosensitive lichenoid eruptions secondary to ant psychiatric medication were the main presentation of the entire drug induced Photodermatoses in our study. The prevalence of chronic actinic dermatitis (CAD) was 8% which is consistent with a previously stated author's study can be attributed to the occupational risk of farmers and manual laborers from rural areas exposed to sunlight more than 6 hours a day (**Figure 10**). Previous reports have indicated that manual labourers and farmers are more vulnerable to the harmful effects of sun exposure. This was also demonstrated in one author's study (Nagaraju GV et al, 2018). This observation is of vital importance in designing the work hours of manual labourers by higher authorities in Government. In 2019, State Labour department by exercising the powers of section 23(A) of the Minimum Wages Act constituted in 1958, rescheduled the working hours of labourers in the month of February to end of April. For morning shift workers, a mandatory break of 3 hours from 12pm to 3pm and work timings was fixed at 8 hours from 7 in the morning to 7 in the evening. For the other shifts which begin after morning and post noon was rescheduled to end before 12 pm and begin after 3 pm.

All the cases of photodermatoses were managed symptomatically with Steroids, Antihistamines and adequate broad spectrum sunscreens. Proper sun protection is the first and foremost above all. Usage of sunscreen significantly reduced the lesions at various sites of patients. Earlier reports by Lehmann and Schwarz also documented the efficacy of topical application of broad-spectrum sunscreen in alleviating UV-B-induced PMLE (Srinivas CR et al, 2012). Apart from this, other than environmental factors, skin diseases were mostly reported to be dependent on occupation, socioeconomic status and age of the patients. This was further elucidated upon by another study (Sharma P et al, 2018).

## Conclusion

Photodermatoses are skin disorders mostly influenced by the age, socioeconomic status, and occupation of the patients. Occupations like manual laborers, farmers with prolonged duration of sun exposure greater than 6 hours are at very high risk of developing photodermatoses. Life style modifications, change in work hours to minimize sun exposure may significantly reduce the incidence of photodermatoses in peak summer season from April to June in tropical climate zones. Prospective studies in this aspect quantifying the type and duration of radiation will enlighten us with better knowledge on the risk factors and clinical pattern of Photodermatoses.

Standard operations protocol has to be implemented by state labour department regarding work hours of manual labourers with a mandatory 3 hour break in the afternoon from 12pm to 3pm and strict measure to ensure adherence with the same.

## Strengths and limitations

The study of photodermatoses in a rural South Indian population has considerable strengths and limitations. Among its strengths are a focused study of a hitherto underrepresented population, a thorough methodology with meticulous history taking and dermoscopy, and a large sample size of 97 cases among 18,120 outpatient department visits, which allows unequivocal conclusions about prevalence. In addition, the study illustrates seasonal patterns of presentation,

informs public health strategies, detects occupational risks, and provides practical recommendations for modifying work times to improve health outcomes. The study limitations are its cross-sectional nature, which limits causal interpretations; exclusion of certain types of photodermatoses, thus limiting generalizability; reliance on patient-reported data, which can cause potential recall bias; and geographical limitations, which limit generalizability to other regions. Further, the lack of long-term follow-up provides no data about chronicity, while the single-center study design could limit patient diversity, thus potentially affecting the total completeness of the results.

## Declarations

## Ethical Considerations, informed consent, and Consent for publication

Informed consent was signed by all study participants. All mentioned ethical aspects and related consents were taken into consideration during the conduct of this study.

## Acknowledgments

We would like to thank our Principal, Dr. Vasanthamalai, and General Manager, Mr. Rahim for their immense involvement. And Miss. Swathi for her technical assistance for this study.

## Source of funding

This research was not supported by any specific grants from public, commercial, or non-profit funding agencies.

## Conflicts of interests

The authors report no conflict of interest.

## Author contributions

Conceptualization and methodology, P.P. and D.S.; Formal analysis, P.P., D.S., R.P.; Visualization and writing - original draft P.P., D.S., R.P.; Writing - review and editing, P.P., D.S. and R.P. All authors have read and agreed to the final version of the manuscript.

## Article category

Cross-sectional study

## References

- [1] M. Bylaite, J. Grigaitiene, G.S. Lapinskaite. Photodermatoses: classification, evaluation and management. *Br J Dermatol*, 161 (2009), pp. 61-68.
- [2] Lehmann P, Schwarz T. Photodermatoses: diagnosis and treatment. *Deutsches Ärzteblatt International*. 2011 Mar;108(9):13.
- [3] R. Roelandts. Photodermatology. Quo vadis?. *Actas Dermosifiliogr*, 100 (2009), pp. 66-72.
- [4] Yashar SS, Lim HW. Classification and evaluation of photodermatoses. *Dermatologic therapy*. 2003 Mar;16 (1):1-7.
- [5] Mehta RV, Sheno SD, Balachandran C, Pai S. Minimal erythema response (MED) to solar simulated irradiation in normal Indian skin. *Indian J Dermatol Venereol Leprol*. 2004;70(5):277-79.

- [6] Sharma VK, Sahni K, Wadhvani AR. Photodermatoses in pigmented skin. *Photochem Photobiol Sci*. 2013;12(1):65-77.
- [7] Srinivas CR, Sekar CS, Jayashree R. Photodermatoses in India. *Indian DermatolVenereol Leprol*. 2012;78, Suppl S1:01-08.
- [8] Sahoo BS, Panda S, Pati S, Sabat SK. Clinical and Epidemiological Profile of Idiopathic Photodermatoses: A Study in a Tertiary Care Setting. *European Journal of Cardiovascular Medicine*. 2023 Oct 1;13(4).
- [9] Nagaraju GV, Haranath PV, Rahaman K, Pranadeep NT, Kumar GP, Parvathi NS. Evaluation of clinical spectrum and frequency of photodermatoses in a skin speciality hospital. *IAJPR*. 2018;8(6):1378-89.
- [10] Sharma L, Basnet A. A clinicoepidemiological study of polymorphic light eruption. 2008.
- [11] Wadhvani AR, Sharma VK, Ramam M, Khaitan BK. A clinical study of the spectrum of photodermatoses in dark-skinned populations. *Clin Exp Dermatol*. 2013 Dec;38(8):823-9. doi: 10.1111/ced.12098. Epub 2013 Jun 13. PMID: 23758593.
- [12] Verma K, Rokde R, Singh U. A clinic epidemiological and histo-pathological study of polymorphic light eruptions in malwa region. *Indian J Clin Exp Dermatol*. 2019; 5:24-9.
- [13] Deshmukh AR, Pathrikar SS, Khedkar MY, Mahajan KR, Sherasiya BS. Clinic epidemiological study of polymorphous light eruption in Marathwada region. *Int J Recent trends Sci Technol*. 2015; 17:128-30.
- [14] Sharma P, Shah A, Lachhramani R, Jagati A. Spectrum of dermatological manifestation in all female attending tertiary health care in a developing country. *Int J Med Res Rev* 2018; 6(08): 420-426.



Published by AMMS Journal, this is an Open Access article distributed under the terms of the Creative Commons Attribution 4.0 International License. To view a copy of this license, visit <http://creativecommons.org/licenses/by/4.0/>.

© The Author(s) 2025