RESEARCH PAPER

Clinico-Epidemiological study of Polymorphic Light Eruption and Biochemical Correlation of Thyroid Dysfunction among these patients: A case-control study

Dr. Sruthi B[1], Prof. Dr. Gopalakrishnan K[2*]

ORCID ID: 0009-0009-2837-3320 (Prof. Dr. Gopalakrishnan K)

[1] Postgraduate Student, Department of Dermatology, Venereology & Leprosy, Chettinad Hospital and Research Institute, Chettinad Academy of Research and Education, Kelambakkam-603103, Tamil Nadu, India.
Email: sruthijuno@gmail.com

[2*] Professor & HOD, Department of Dermatology, Venereology & Leprosy, Chettinad Hospital and Research Institute, Chettinad Academy of Research and Education, Kelambakkam-603103, Tamil Nadu, India.
Email: dermdrgopalakrishnan@gmail.com (Corresponding Author)

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ABSTRACT

Background: The most common idiopathic photodermatosis is Polymorphic light eruption (PMLE), which is manifested by dermal abnormalities, particularly itching on areas exposed to the sun. Chronic skin diseases like PMLE are believed to be closely linked to endocrine disorders, especially autoimmune thyroid disorders. Despite all the associations, very little Indian literature prevails regarding PMLE and thyroid dysfunction.

Objectives: To analyze the risk factors associated with PMLE and to evaluate the prevalence of thyroid dysfunction among PMLE patients and healthy controls.

Materials and Methods: This study was carried out in the department of Dermatology of Chettinad Hospital and Research Institute (CHRI), over 3 months from August 2025 to September 2025. A total of 64 PMLE patients and 64 healthy controls were recruited for the study after getting ethical committee approval (IHEC-I/4169/25). Physical examination and thyroid function tests (Serum T3, T4 and TSH), using chemiluminescent immunoassay, were conducted. Data were analysed using SPSS software v.25. T-test and chi-square tests were done, with p-value <0.05 considered statistically significant.

Results: Serum total T3 and T4 values were lower in cases (p=0.002 & p=0.01), but the mean TSH value was higher in cases than in controls, with statistical significance (p < 0.001). Thyroid disorders were found in 28.1% of PMLE cases and in 9.4% of healthy controls, with statistical significance (p=0.009), and it also shows a positive association with family history of thyroid disorders (p=0.02).

Conclusion: The association of PMLE and hypothyroidism establishes a strong link between autoimmune and endocrine disorders. Combining screening of thyroid disorders in PMLE assessment may help in prompt diagnosis and thus early treatment measures.

Keywords: Autoimmune, endocrine, immunology, polymorphic light eruption, thyroid disorders.

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Introduction

Polymorphic Light Eruption (PMLE) is one of the commonest idiopathic photodermatoses. In simple terms, it represents an abnormal skin response to ultraviolet light. Patients usually develop itchy papules, plaques or mixed lesions over areas exposed to the sun (1). The current understanding is that PMLE reflects a type IV delayed hypersensitivity reaction to photo-altered antigens in individuals who are genetically predisposed. Due to this immune response, affected people tend to experience recurrent flare-ups, especially during seasons with sudden increases in sunlight exposure (2). The condition has a broad clinical spectrum and an unpredictable course, which often makes it challenging to distinguish from other photosensitive disorders and to manage effectively (3). The prevalence of PMLE worldwide has been keenly looked upon, where the rates vary from 5% to 20%,

depending upon the region, race and intensity of sunlight (4). Although the precise pathology is yet to be known, some factors like environment, immunity and hormones are known to influence the onset of PMLE (5). In India, PMLE holds a special place due to the constant, high intensity of ultraviolet radiation, predominant occupation outdoors, and widespread dusky skin colour, all of which may affect the pattern and outcome of the disease (6).

The common sites involved in PMLE are face, forearms, neck and exposed areas of the chest, where repeated eruptions occur as a result of exposure to the sun (7). The age group 30-40 and the female gender are more susceptible to developing the disease. Patients in India usually manifest with papules, and the condition is long-standing with repeated episodes during summer, states Sharma and Basnet (8). The association of PMLE, and autoimmune thyroid disorders have been explored by the latest studies (9).

PMLE has evolved from a standalone skin disorder to a systemic disorder, from a clinical point of view (10). Both PMLE and some endocrine disorders are believed to have a common etiopathogenesis, i.e., autoimmunity. The thyroid gland, often involved in various metabolic processes, is observed as an organ that is related to photosensitive disorders, since an imbalance in thyroid hormones can lead to disturbances in immunity and dermal reaction to light (11).

Latest worldwide and Indian literature have shown an association between thyroid disorders and PMLE, which is also statistically significant. A subset of patients with PMLE also presented with thyroid disorders, both in biochemical and clinical aspects, as described by Verma et al. (12). Studies related to histology demonstrated infiltration of lymphocytes and inflammation surrounding blood vessels, depicting a role of cell-mediated immunity in both thyroid and the skin (13). Disorders associated with sensitivity to light frequently occur together with autoimmune disorders, emphasizing the importance of biochemical screening of thyroid tests in PMLE patients, states Murphy (14).

Seetharam and Sridevi explained the occurrence of PMLE and autoimmune thyroiditis together, thus underscoring that dermal sensitivity to light may help in early diagnosis of autoimmune thyroiditis (15). Hence, biochemical correlation of thyroid hormones together with clinical and epidemiological assessment in PMLE is essential, especially in the context of Indian literature, where both thyroid dysfunction and photodermatoses are frequent problems of public health.

Hence, this investigation was chosen to assess the holistic clinical and epidemiological features of PMLE and to evaluate the biochemical correlation of thyroid disorders in patients. This case-control study hopes to aid in enhancing diagnostic watchfulness, screening of coexisting skin and endocrine problems, and early treatment plans for patients susceptible to both disorders.

Aim

The purpose of this study is to explore the clinic-epidemiological characteristics of polymorphic light eruption (PMLE) and to examine whether thyroid function abnormalities are present in patients diagnosed with PMLE.

Objectives

1. To identify and describe the epidemiological variables commonly associated with PMLE.
2. To assess the frequency and pattern of thyroid dysfunction in individuals with PMLE.
3. To evaluate whether any significant clinical or biochemical correlation exists between thyroid abnormalities and PMLE.

Methodology

Study design and study setting:

This case-control study was conducted in the Department of Dermatology, Chettinad Hospital and Research Institute (CHRI), Kelambakkam.

Study duration:

The study was carried out over 3 months from September 2025 to November 2025.

Study population:

The study involved 128 participants who visited the outpatient department of Dermatology. A total of 64 cases diagnosed with PMLE & 64 healthy controls without any skin disorders sensitive to light were recruited for the study, and both groups were matched for sex, age & exposure to sunlight.

Sample size:

Sample size calculation was done using the *nMaster Software Version 2.0* upon substituting values in the formula for a single proportion:

$$n = \frac{Z^2_{(1-\alpha/2)} \times P(1-P)}{d^2}$$

where:

$Z_{(1-\alpha/2)} = 1.96$ for a 95% confidence level,

$P = 0.94$ (based on prevalence value taken from the study by Meena D et al., 2022)

$d = 0.06 = 6\%$ absolute precision

Upon substituting the values,

$$n = \frac{(1.96)^2 \times 0.94\ (1-0.94)}{(0.06)^2}$$

$$n = 64.2$$

Hence, the final sample size was 64.

Inclusion and exclusion criteria:

Patients of both sexes, aged above 18 years, who provided consent, who were willing to undertake blood investigations, and who were diagnosed with PMLE (On the basis of clinical features, H/O repeated eruptions after exposure to the sun and remission upon avoiding exposure to the sun) were included in the study. Patients with other inflammatory photodermatoses, lupus erythematosus, already undergoing treatment for photosensitive conditions, undertaking steroids for the past 3 months were excluded from the study.

Procedure:

Patients who satisfied the inclusion criteria were given a proforma consisting of socio-demographic profile, comorbidities, exposure to the environment and occupation, detailed family & menstrual history, and use of any drugs/medicines. They underwent general and local (cutaneous) examination. Fitzpatrick's 6-point classification was used to record the phenotype of the skin, and the composition, symmetry & disposition were elaborated carefully. Patients whose diagnosis was unsure were advised to avoid sunlight for a period of 2 weeks, and remission followed by lesion recurrence upon exposure to sunlight again confirmed the diagnosis of PMLE. All subjects were performed mucocutaneous evaluation to note any secondary changes and any other associated dermatoses.

After assessing clinically, 5 ml of venous blood was collected with sterile aseptic precautionary measures, along with investigations. Serum was kept separately and examined for thyroid hormones. TSH (Thyroid-stimulating hormone) values were estimated with a chemiluminescent immunoassay. Measurement of T3 (Triiodothyronine) and T4 (Thyroxine) values was done using immunotech kits.

When all the thyroid hormone values were within the normal range, participants were categorized as euthyroid. When T3 & T4 values were normal and TSH alone was raised, they were categorized as subclinical hypothyroid, and when both T3/T4 and TSH levels were abnormal, they were categorized as overt hypothyroid. Finally, when T3/T4 levels were elevated and TSH levels were lower, then it is classified as hyperthyroid. Each participant was assessed for the signs and symptoms of thyroid disorders, like swelling in the neck, tiredness, change in weight, bowel disturbances, and intolerance to cold, to ensure precise correlation.

Outcomes measured:

In this study, the main outcome of interest was the frequency of thyroid abnormalities among patients diagnosed with PMLE, and how this is compared with the control group. In addition to this, we also looked at several related aspects, such as socio-demographic characteristics, the pattern and severity of thyroid dysfunction, and the clinical morphology observed in PMLE cases.

Statistical Analysis:

The collected data were compiled into MS Excel, and SPSS v.25.0 was used to analyze it. Qualitative data, such as occupation, gender, and type of lesion, were expressed using frequencies and percentages, whereas means and standard deviations were used to express quantitative data, like hormonal levels and age. Independent t-test was used to determine the association between qualitative variables, whereas Chi-square test was used for categorical variables. A p-value of <0.05 was considered statistically significant. Pearson's correlation coefficient was used to assess the correlation between biochemical and clinical variables.

Ethical consideration:

Ethical Committee approval was obtained from the Institutional Human Ethics Committee (IHEC), Chettinad Hospital and Research Institute (CHRI) (Ref No: IHEC-I/4169/25 dt 15.09.2025) before the initiation of the study. Strict confidentiality was maintained, and no identifying details of participants were mentioned anywhere in the study.

Results

Overall, 128 participants (64 cases and 64 controls) were recruited for the study.

Table 1: Socio-demographic Characteristics of Study Participants

Variable	Cases (n=64) n (%)	Controls (n=64) n (%)	p-value
Age			
18–30	22 (34.4)	24 (37.5)	0.71
31–45	30 (46.9)	28 (43.8)	
>45	12 (18.8)	12 (18.8)	

Gender			
Male	20 (31.3)	26 (40.6)	0.29
Female	44 (68.7)	38 (59.4)	
Occupation			
Outdoor occupation	38 (59.4)	28 (43.8)	0.08
Indoor occupation	26 (40.6)	36 (56.2)	
Fitzpatrick Skin Type			
Fitzpatrick III	10 (15.6)	14 (21.9)	0.32
Fitzpatrick IV	38 (59.4)	36 (56.2)	
Fitzpatrick V	16 (25.0)	14 (21.9)	
Family History of PMLE			
Yes	8 (12.5)	3 (4.7)	0.12
No	56 (87.5)	61 (95.3)	

Table 1 demonstrates the socio-demographic profile of the participants. Most of the participants were between 31-45 years age group among both cases (n=30, 46.9%) and controls (n=28, 43.8%). There was no statistical significance between the two groups (p=0.71). This indicates that most individuals affected by PMLE are between the 3rd and 4th decades of their lives.

Females were mostly affected in the study among both cases (n=44, 68.7%) and controls (n=38, 59.4%), and the difference was not statistically significant (p=0.29). This finding indicates that there is a higher prevalence of PMLE among females when compared to males.

Individuals who work outdoors developed PMLE among both the cases (n=38, 59.4%) and controls (n=28, 43.8%), suggesting that exposure to sunlight and UV radiation plays a significant role in the occurrence of PMLE. However, there was no statistical significance (p=0.08).

The Fitzpatrick skin type scores were almost similar in both groups. Most participants belonged to Type IV among both cases (n=38, 59.4%) and controls (n=36, 56.2%), and there was no statistical significance (p=0.32). Family H/O PMLE was noted more among cases (n=8, 12.5%) than controls (n=3, 4.7%), and the association was not statistically significant (p=0.12).

Table 2: Clinical Profile of PMLE Cases (n=64)

Clinical Parameter	Frequency (n) (n = 64)	Percentage (%)
Duration		
<6 months	18	28.1
6–12 months	22	34.4
>12 months	24	37.5
Seasonal Occurrence		
Summer season	52	81.3
Winter season	12	18.7
Type of lesion		
Papular lesions	36	56.3
Plaque lesions	10	15.6
Vesicular lesions	6	9.4
Mixed lesions	12	18.7
Site of onset		
Forearm site	34	53.1
Face site	14	21.9
Neck site	10	15.6
Other sites	6	9.4
Associated symptoms		
Itching	54	84.4
Burning	18	28.1

Table 2 exhibits the clinical features of PMLE cases. The most common disease duration at the time of data collection was more than 12 months, suggesting a long-lasting trend in the disease pattern of the participants.

A profound seasonal variation was noted, where most of the patients reported exacerbation or initiation of lesions during the summer season (n=52, 81.3%), indicating a strong correlation with UV radiation.

Papular lesion was the most commonly observed type of lesion in the study participants (n=36, 56.3%), thus indicating that it is the most frequent variant of PMLE. The commonly observed sites of lesions were forearms (n=34, 53.1%) and face (n=14, 21.9%), indicating that areas exposed to sunlight are most commonly affected by PMLE.

Itching was the most commonly observed clinical feature among the study participants (n=54, 84.4%), indicating its association with the inflammation caused as a result of PMLE.

Table 3: Thyroid Function Profile Among Cases and Controls

Parameter	Cases (Mean ± SD)	Controls (Mean ± SD)	p-value
TSH (µIU/mL)	4.62 ± 2.01	2.98 ± 1.35	<0.001
T3 (ng/mL)	0.94 ± 0.32	1.12 ± 0.28	0.002
T4 (µg/dL)	7.9 ± 1.8	8.6 ± 1.5	0.01
Thyroid dysfunction			
Yes	18 (28.1%)	6 (9.4%)	0.009
No	46 (71.9%)	58 (90.6%)	

Table 3 compares the thyroid profile among the cases and controls. The mean thyroid stimulating hormone (TSH) level was 4.62 ± 2.01 µIU/ml in cases, which is very much higher when compared to controls (2.98 ± 1.35 µIU/ml), and the association is also statistically significant (p<0.001). This indicates the association of hypothyroidism along with PMLE among the cases.

Also, T3 and T4 levels were higher among the control group (T3: 1.12 ± 0.28) (T4: 8.6 ± 1.5) than the cases (T3: 0.94 ± 0.32) (T4: 7.9 ± 1.8), and the difference was also statistically significant (T3: p=0.002) (T4: 0.01). Thus, it signifies the presence of subclinical hypothyroidism in PMLE cases.

Thyroid dysfunction was noted among 28.1% (n=18) cases when compared to controls, which is 9.4% (n=6), and the difference was also statistically significant (p=0.009). This observation implies that PMLE is closely associated with thyroid dysfunction (especially hypothyroidism and autoimmune thyroiditis).

Table 4: Association Between Thyroid Dysfunction and Clinical Features in PMLE Cases (n=64)

Clinical Variable	Thyroid Dysfunction Present (n=18)	Absent (n=46)	p-value
Female sex	15 (83.3%)	29 (63.0%)	0.12
Duration >6 months	14 (77.8%)	26 (56.5%)	0.10
Family history of thyroid disease	6 (33.3%)	4 (8.7%)	0.02
Outdoor occupation	12 (66.7%)	26 (56.5%)	0.44
Papular lesion type	10 (55.6%)	26 (56.5%)	0.94

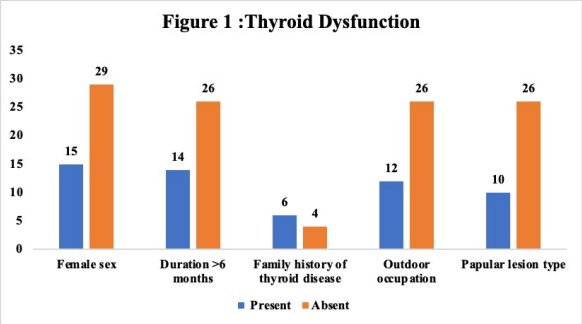

Figure 1: Association Between Thyroid Dysfunction and Clinical Features in PMLE Cases (n=64)

Table 4 summarizes the association between clinical features of PMLE and thyroid dysfunction among the PMLE cases, where 28.1% of PMLE cases (n=18) also showed the presence of thyroid dysfunction.

Female patients mostly showed the presence of thyroid dysfunction among the cases (n= 15, 83.3%) than those in euthyroid individuals, but the difference was not statistically significant (p=0.12). Also, a higher proportion of thyroid dysfunction cases presented with a disease duration of more than 6 months (n=14, 77.8%), but the difference was not statistically significant (p=0.10).

Positive family history was observed in many thyroid dysfunction cases (n=6, 33.3%), and the difference was statistically significant (0.02), indicating the possibility of thyroid autoimmunity susceptibility in PMLE patients. Individuals working outdoors were greater among the thyroid dysfunction group (n=12, 66.7%) when compared to those who belonged to the euthyroid status group, and the difference was also not statistically significant (p=0.44).

Table 5: Odds Ratio Analysis of Risk Factors for Thyroid Dysfunction in PMLE Cases

Risk Factors	Odds Ratio (95% CI)	p-value
Gender		
Female	2.6 (0.8 – 8.3)	0.11

Male	Ref	
Family history of thyroid disease		
Yes	5.0 (1.3 – 18.8)	0.02
No	Ref	
Occupational exposure		
Outdoor worker	1.5 (0.6 – 3.9)	0.35
Indoor worker	Ref	
Disease duration		
> 6 months	2.3 (0.8 – 6.2)	0.12
≤ 6 months	Ref	

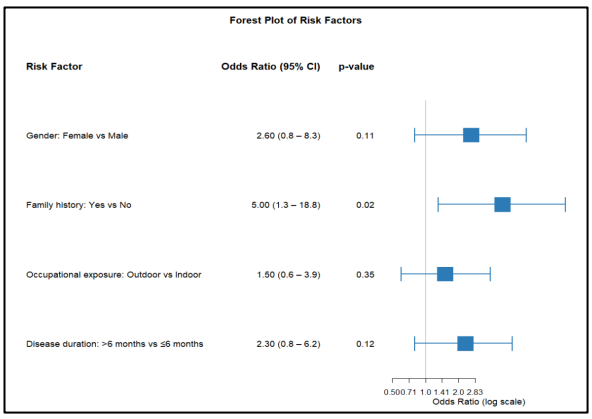

Figure 2: Odds Ratio Analysis of Risk Factors for Thyroid Dysfunction in PMLE Cases

Table 5 demonstrates the Odds Ratio analysis of the risk factors associated with PMLE cases and thyroid dysfunction. When compared to males, the female patients showed greater odds of thyroid dysfunction (OR=2.6, 95% CI=0.8 - 8.3), but the association was not statistically significant (p=0.11). Positive family history showed statistical significance (p=0.02) and also exhibited five times greater odds of developing thyroid dysfunction (OR=5.0, 95% CI=1.3 - 18.8). Outdoor occupation exhibited a mildly increased risk (OR=1.5, 95% CI=0.6 - 3.9); however, the difference was not significant statistically (p=0.35). Finally, individuals whose duration of disease is more than 6 months showed greater odds of thyroid dysfunction (OR=2.3, 95% CI=0.8-6.2), but the difference was not statistically significant too (p=0.12).

Discussion

This case-control study explored the clinical & epidemiological profile of PMLE and its correlation with thyroid disorders in a biochemical aspect. Thyroid dysfunction was noted in around 28.1% of cases when compared to those of controls (9.4%) in our study. There was a statistically significant difference in the values of serum TSH, which are elevated and in the values of T3 and T4, which are reduced in the cases. These findings display a preponderance pattern of hypothyroidism in PMLE, and it contributes to the hypothesis that an imbalance of immunity with respect to thyroid autoimmunity is closely linked to photosensitive dermatoses.

Sharma et al. [16] inspected the function of the thyroid in PMLE with a case-control study, and stated that around 26.7% of participants showed abnormalities of thyroid hormones, where the mean TSH levels were very much greater than the control group, signifying a preponderance of subclinical hypothyroidism. The mean TSH values in PMLE cases were within a close range of our study, and both studies confirm a substantial pattern of higher TSH levels with slightly lower T3 and T4 values, indicating early hypothyroid profiles. The similar findings in both studies indicate that involvement of the thyroid in PMLE is uniform across the Indian subcontinent, probably due to evenly distributed ultraviolet radiation exposure and genetic susceptibility across the whole country.

Hasan et al. [17] performed an extended follow-up study that recruited 94 PMLE cases to detect the association between autoimmune disorders (like rheumatological and thyroid dysfunction) and other diseases. After long-term observation, around 18% of the study population developed autoimmune endocrine disorders, especially disorders of thyroid. The findings of the study corroborate that the chronic disease pattern of PMLE extends more than that of the skin. These findings closely resemble our study findings, where a higher number of patients with thyroid dysfunction was noted, whose duration of disease was more than 6 months, indicating that consistent activation of the immune system may lead to endocrine abnormalities. Even the common features like infiltration of lymphocytes and Type 4 hypersensitivity in both the skin lesion and thyroid dysfunction show a concurrent autoimmunity mechanism.

Norris et al. [18] in a study revealed that expression of adhesion molecules, especially E-selectin and ICAM-I, is augmented in lesions of PMLE, thus supporting inflammation around blood vessels and recruitment of T-cells. The activation of the endothelium is also a

characteristic feature of autoimmune thyroiditis. The study signified that PMLE displayed an abundant response of immunity, similar to autoimmune endocrine disorders. The elevated TSH levels and decreased T3 & T4 levels in our study emphasized this theory, signifying that consistent activation of the immune system may also extend beyond skin to endocrine glands like the thyroid gland.

Chadha et al. [19] conducted an assessment of thyroid hormones in PMLE cases and noted that around 24% of patients exhibited thyroid dysfunction, particularly hypothyroid biochemical pattern. The findings are similar to our study, which signified that female sex was found to have coexistence of both thyroid dysfunction and PMLE. Despite not being statistically significant, the female predominance pattern can be justified by the modulation of hormones and increased susceptibility in females. Also, the study findings recommend that every chronic PMLE patient should undergo thyroid dysfunction screening.

Kadhurina et al. [20] stated that the pathophysiology of PMLE may be due to the irregular activity of cytokines, especially TNF-α & IL-10, and also due to damaged keratinocytes due to ultraviolet radiation. The cytokines form a major part of the autoimmunity of the thyroid, along with other related mediators of inflammation that help in the cell death of thyrocytes and the formation of autoantibodies. The common pathway of cytokines between thyroid dysfunction and PMLE further strengthens the immunopathologic relationship between them. Hence, the elevated TSH levels among PMLE cases can be attributed to dysregulation of immunity in our study, where subclinical hypothyroidism may be due to modulation in the activity of the hypothalamic-pituitary-thyroid axis, caused as a result of inflammatory cytokines.

Guarrera [21] gave a complete description of PMLE on UV-disorders and explained it as an abnormal immunologic reaction to ultraviolet radiation that included both adaptive and innate immune types. He also stated that alterations in immunity can also be found in localised PMLE cases. This concept can also be explained in our findings, where an alteration in thyroid profile was found without an overt thyroid pattern in many patients, thus signifying systemic autoimmunity. The repeated lesions in PMLE during the summer season in our study can be explained by the exposure to ultraviolet radiation, which in turn leads to dysregulation in the immune system, as elaborated by Guarrera.

Sharma and Shah [22] assessed the association between the abnormal thyroid diagnostic results and UV-radiation-induced lesions, where around 23% of PMLE cases exhibited subclinical hypothyroidism. These findings proved that an imbalance in the thyroid hormones may augment photosensitivity to UV radiation by altering threshold of the immune system. This finding is similar to our study, where reduced T3 and T4 levels were found in chronic duration and repeated lesions in summer months, implying that dysregulation can enhance sensitivity to light. Both studies underscore the significance of screening for thyroid disorders and associated endocrine diagnostic tests in recurrent patients of PMLE.

Boonstra et al. [23] conducted a follow-up study involving 110 cases of PMLE and noted that 30% showed systemic autoimmunity evidence serologically (antinuclear and anti-thyroid antibodies), even without endocrine clinical features. The study results exhibited that PMLE play a role as an indicator of preponderance to autoimmunity. This finding aligns with our study, where around 33% of PMLE cases showed subclinical hypothyroidism, strongly suggesting that PMLE could be due to a hidden autoimmune tendency involving the thyroid. The long-term findings also exhibited that cases with autoimmune markers faced frequent recurrence, which is also seen in our study in PMLE patients with thyroid dysfunction.

The accruing evidence from all the above studies exhibits significant resemblance to the findings of our study, where a higher frequency of PMLE cases showed thyroid dysfunction than those of controls, with a statistically significant positive family history of thyroid disorders. Overall, the above data indicate that PMLE constitute a systemic, inflammatory, immunological disorder along with components of the endocrine system, associated with corresponding epidemiological, histological and biochemical findings from many regions.

Conclusion

The study findings established a remarkable association between thyroid dysfunction and PMLE, which is believed to occur as a result of cytokine-induced mechanisms. Early screening and diagnosis of thyroid dysfunction in PMLE cases may help in controlling the disease effectively. Follow-up studies should be conducted in the future to better establish the relationship between thyroid autoimmunity and other photosensitive disorders.

References:

1. Oakley AM, Ramsey ML. Polymorphic Light Eruption. In: StatPearls. Treasure Island (FL):

StatPearls Publishing; 2025 [cited 2025 Oct 5]. Available from: http://www.ncbi.nlm.nih.gov/books/NBK430886/

2. Lembo S, Raimondo A. Polymorphic Light Eruption: What's New in Pathogenesis and Management. Front Med. 2018 Sep 10 [cited 2025 Oct 5];5. Available from: https://www.frontiersin.org/journals/medicine/articles/10.3389/fmed.2018.00252/full

3. Karthikeyan K, Aishwarya M. Polymorphous Light Eruption– An Indian Scenario. Indian Dermatol Online J. 2021 Apr [cited 2025 Oct 5];12(2):211. Available from: https://journals.lww.com/idoj/fulltext/2021/12020/Polymorphous_Light_Eruption__An_Indian_Scenario.1.aspx

4. Burfield L, Rutter KJ, Thompson B, Marjanovic EJ, Neale RE, Rhodes LE. Systematic review of the prevalence and incidence of the photodermatoses with meta-analysis of the prevalence of polymorphic light eruption. J Eur Acad Dermatol Venereol. 2023 [cited 2025 Oct 5];37(3):511–20. Available from: https://onlinelibrary.wiley.com/doi/abs/10.1111/jdv.18772

5. Kamboj A, Lause M, Kumar P. Ophthalmic manifestations of endocrine disorders—endocrinology and the eye. Transl Pediatr. 2017 Oct [cited 2025 Oct 5];6(4):28699–28299. Available from: https://tp.amegroups.org/article/view/16985

6. Kochupillai N. Clinical endocrinology in India. Curr Sci. 2000 [cited 2025 Oct 5];79(8):1061–7. Available from: https://www.jstor.org/stable/24104359

7. Hönigsmann H. Polymorphous light eruption. Photodermatol Photoimmunol Photomed. 2008 [cited 2025 Oct 5];24(3):155–61. Available from: https://onlinelibrary.wiley.com/doi/abs/10.1111/j.1600-0781.2008.00343.x

8. Sharma L, Basnet A. A clinicoepidemiological study of polymorphic light eruption. Indian J Dermatol Venereol Leprol. 2008 Jan 1 [cited 2025 Oct 5];74:15. Available from: https://ijdvl.com/a-clinicoepidemiological-study-of-polymorphic-light-eruption/

9. Pulletikurti M, Gopal KVT, Raju PK, Bulla RR. A Study of Clinicoepidemiological Features and Association with Autoimmune Thyroiditis in Polymorphic Light Eruption. Clin Dermatol Rev. 2025 Mar [cited 2025 Oct 5];9(1):22. Available from: https://journals.lww.com/cddr/fulltext/2025/01000/a_study_of_clinicoepidemiological_features_and.4.aspx

10. Gruber-Wackernagel A, Byrne SN, Wolf P. Polymorphous Light Eruption: Clinic Aspects and Pathogenesis. Dermatol Clin. 2014 Jul 1 [cited 2025 Oct 5];32(3):315–34. Available from: https://www.derm.theclinics.com/article/S0733-8635(14)00027-8/abstract

11. Mishra R, Talanikar H, Raheja A, Deora MS, Yadav S, Poulose D, et al. Biochemical Correlation of Thyroid Dysfunction Among Patients Presenting With Polymorphic Light Eruption. Cureus. 2022 Mar 8 [cited 2025 Oct 5];14. Available from: https://cureus.com/articles/79113-biochemical-correlation-of-thyroid-dysfunction-among-patients-presenting-with-polymorphic-light-eruption

12. Verma K, Singh U, Rokde R. A clinicoepidemiological and histo-Pathological study of polymorphic light eruptions in malwa region. IP Indian J Clin Exp Dermatol. 2025 Jul 22 [cited 2025 Oct 5];5(1):24–9. Available from: https://ijced.org/archive/volume/5/issue/1/article/7562

13. Manthale N, Raikar DR, Raikar SR, Raikar SR, Raikar DR. Polymorphic light eruption: Clinico epidemiological study and histopathological correlation. Int J Health Sci. 2022 Apr 23 [cited 2025 Oct 5];6(S2):5809–17. Available from: https://sciencescholar.us/journal/index.php/ijhs/article/view/6470

14. Murphy GM. Diseases associated with photosensitivity. J Photochem Photobiol B. 2001 Nov 15 [cited 2025 Oct 5];64(2):93–8. Available from: https://www.sciencedirect.com/science/article/pii/S1011134401002287

15. Seetharam KA, Sridevi K. Association of polymorphic light eruption and autoimmune thyroiditis. Indian J Dermatol Venereol Leprol. 2010 Nov 1 [cited 2025 Oct 5];76:704. Available from: https://ijdvl.com/association-of-polymorphic-light-eruption-and-autoimmune-thyroiditis/

16. Sharma L, Lamba S, Singh SK. Thyroid function tests in cases of polymorphic light eruption: A case–control study. Indian Dermatol Online J. 2014 Sep [cited 2025 Oct 5];5(3):291. Available from: https://journals.lww.com/idoj/fulltext/2014/05030/thyroid_function_tests_in_cases_of_polymorphic.9.aspx

17. Hasan T, Ranki A, Jansen CT, Karvonen J. Disease Associations in Polymorphous Light Eruption: A Long-term Follow-up Study of 94 Patients. Arch Dermatol. 1998 Sep 1 [cited 2025 Oct 5];134(9):1081–5. Available from: https://doi.org/10.1001/archderm.134.9.1081

18. Norris PG, Barker JNWN, Allen MH, Leiferman KM, MacDonald DM, Haskard DO, et al. Adhesion Molecule Expression in Polymorphic Light Eruption. J Invest Dermatol. 1992 Oct 1 [cited 2025 Oct

5];99(4):504–8. Available from: https://www.sciencedirect.com/science/article/pii/S0022202X92903525

19. Chadha C, Deshmukh M, Gugle AS. Study of Thyroid Function Tests in Cases of Polymorphic Light Eruption in Tertiary Care Institute. MVP J Med Sci. 2018 Aug 17 [cited 2025 Oct 5];101–3. Available from: https://www.informaticsjournals.co.in/index.php/mvpjms/article/view

20. Kadurina M, Kazandjieva J, Bocheva G. Immunopathogenesis and management of polymorphic light eruption. Dermatol Ther. 2021 [cited 2025 Oct 5];34(6):e15167. Available from: https://onlinelibrary.wiley.com/doi/abs/10.1111/dth.15167

21. Guarrera M. Polymorphous Light Eruption. In: Ahmad SI, editor. Ultraviolet Light in Human Health, Diseases and Environment. Cham: Springer International Publishing; 2017 [cited 2025 Oct 5]. p. 61–70. Available from: https://doi.org/10.1007/978-3-319-56017-5_6

22. Sharma P, Shah A. ULTRAVIOLET INDUCED LIGHT ERUPTIONS AND ABNORMAL LABORATORY THYROID TEST REPORTS- IS THERE ANY CORRELATION. J Evol Med Dent Sci. 2017 Feb 9 [cited 2025 Oct 5];6(12):960–2. Available from: https://www.jemds.com/data_pdf/Parikshit-.pdf

23. Boonstra HE, Weelden H van, Toonstra J, Vloten WA van. Polymorphous light eruption: A clinical, photobiologic, and follow-up study of 110 patients. J Am Acad Dermatol. 2000 Feb 1 [cited 2025 Oct 5];42(2):199–207. Available from: https://www.jaad.org/article/S0190-9622(00)70102-2/abstract