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**Original Research Article**

# Study of profile of polymorphous light eruption at a tertiary referral center

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## ABSTRACT

**Background:** Polymorphous light eruption (PMLE) is the most common endogenous photodermatosis. But only few studies are available from India regarding this photodermatosis. It is common in women, often worse in spring. The lesions are usually monomorphous in an individual patient but polymorphic in different patients.
**Methods:** The study was conducted between October 2010 and March 2012. 78 patients with clinical diagnosis of PMLE, who attended Dermatology OPD at Dr. D. Y. Patil Hospital and Research Institute, Kolhapur were included in present study. Detailed history, clinical examination and relevant investigations were done. The collected data were tabulated and analyzed.
**Results:** The age group of the patients ranged from 3 years to 58 years. Maximum number of patients were seen in the age group of 21-30 years. The female to male ratio was found to be 1.78:1.Onset of PMLE lesions was maximum in the month of March. Majority of patients were housewives. Itching was the most common symptom. In 32.05% of patients, lesions developed within 30 minutes of sun exposure. Family history of PMLE was present in 6 (7.69%) cases.
**Conclusions:** PMLE was found most commonly in second and third decades of life since people in this age group are more exposed to sun, more in women probably because of hormonal differences.The maximum number of cases was noted in the month of March when the sun exposure is high. The maximum cases in housewives, as they have short intermittent sun exposure and absence of hardening phenomenon. Higher incidence was noted with cotton clothing as it has lower UV protection. Most of the patients developed lesions within 30 minutes of sun exposure. History of recurrence of PMLE was noted in 30 patients. Only 6 patients gave family history of PMLE because of milder nature of the disease along with difference in clothing and working environment.

**Keywords:** Polymorpohous light eruption, Photodermatoses, Photosensitivity

## INTRODUCTION

Sunlight is essential for the survival of all living things as various metabolic, endocrine, and physiological processes are dependent on sunlight exposure. Photodermatoses are a group of disorders resulting from abnormal cutaneous reactions to solar radiation. They include idiopathic photosensitive disorders, drug or chemical induced photosensitivity reactions, DNA repair-deficiency photodermatoses and photoaggravated dermatoses.[1]

Polymorphous light eruption (PMLE) is the most common endogenous photodermatosis.[2] According to studies and published literature, the eruption is generally itchy, symmetrical, erythematous or skin coloured, papular and non-scarring on sun exposed parts of the body. Other presentations include plaque like, vesicular,

bullous or combination of these. It may have haemorrhagic, erythema multiforme like and insect bite like appearance. It is commoner in women, often worse in spring. The lesions are usually monomorphous in an individual patient but polymorphic in different patients.[3]

The reported prevalence in various cohort studies from England, Sweden and Singapore varies from 10-20% and 26% in a study by Fotiades et al.[4,5] No such data however, is available from India even though the exposure to sunlight is high.[6]

The etiology of PMLE is not fully understood, and it is likely to be multifactorial. Many authors consider PMLE as delayed type of hypersensitivity reaction to ultra violet radiation (UVR) induced cutaneous antigen. PMLE appears to have a genetic basis, affecting patients' families one and half times more commonly than general population.[7] However, disease expression in genetically susceptible individuals is heavily dependent on environmental factors as well.[8]

Typically affected sites are the bridge of the nose, malar areas of cheeks, tip of chin, sides and back of neck, upper chest, dorsa of the hands, dorsolateral aspects of arms, fronts and backs of the legs and dorsa of the feet. Lesional distribution and morphology vary greatly both between and within patients, but in general there are grouped, erythematous or skin coloured, large or small papules, sometimes coalescing into smooth or irregularly surfaced, confluent plaques.[9]

## METHODS

The clinical material for the present study was obtained from the patients attending the OPD of the Department of Dermatology, Venereology and Leprosy, Dr. D. Y. Patil Hospital, Kadamwadi, Kolhapur.

Seventy eight (78) patients suffering from polymorphous Light Eruption who attended the outpatient department during the period from October 2010 to March 2012 were included in the present study.

The study was approved by the ethical committee of the institute.

The diagnosis of polymorphous light eruption was made clinically.

Written informed consent was obtained from patients who were included in the study.

### *History*

A detailed history regarding patient's identification, including patients name, age, sex, address, occupation was recorded. Further, details regarding month and age of onset of symptoms of PMLE, its severity, nature - transient, persistent or recurrent, aggravating factors, constitutional and other symptoms, results of healing of the rash and any change in the severity of symptoms were recorded. History of the disease in the family, patient's profession, duration of exposure to sunlight during outdoor activities including travel, preference for the type of clothing, materials used during daytime - cosmetics and sunscreen as well as types of previous treatments were noted.

### *Examination*

A thorough clinical examination was performed to determine the characteristics and distribution of skin lesions including site, size, shape, colour, type and secondary changes, if any in the skin lesion. Skin type of the patient was also recorded. Oral mucosa, genitalia and nails were also examined and the findings were noted. Systemic examination was done in all the patients to find out any associated conditions.

### *Exclusion criteria*

Patients not giving consent to be included in the study were excluded.

## RESULTS

Seventy eight clinically diagnosed and untreated cases of polymorphous light eruption (PMLE) were studied. These patients belong to both sexes and were between the ages of 3 years and 58 years. Following are the results and observations made from the study.

**Table 1: Age wise distribution of PMLE.**

| Age in years | Numbers | Percentage (%) |
|---|---|---|
| **0–10** | 6 | 7.69 |
| **11–20** | 23 | 29.48 |
| **21–30** | 32 | 41.02 |
| **31–40** | 7 | 8. 97 |
| **41–50** | 6 | 7.69 |
| **51–60** | 4 | 5.12 |
| **Total** | 78 | 100. 00 |

Maximum number of patients 32 (41.02%) were seen in the age group of 21-30 years and the minimum was in the age group of 51-60 years. Youngest patient was three years old male patient, and the oldest was 58 years old female patient.

**Table 2: Sex distribution of PMLE.**

| Sex | Number | Percentage (%) |
|---|---|---|
| **Female** | 50 | 64.10 |
| **Male** | 28 | 35. 90 |
| **Total** | 78 | 100. 00 |

In the present study out of 78 cases, 50 (64.10%) patients were females and 28 (35. 90%) patients were males. Female to male ratio was 1.78:1.

**Table 3: Month wise distribution of PMLE.**

| Month | Number | Percentage (%) |
|---|---|---|
| **October 2010** | 6 | 7.69 |
| **November 2010** | 1 | 1.28 |
| **December 2010** | 0 | 0 |
| **January 2011** | 3 | 3.84 |
| **February 2011** | 6 | 7.69 |
| **March 2011** | 12 | 15.38 |
| **April 2011** | 5 | 6.41 |
| **May 2011** | 2 | 2.56 |
| **June 2011** | 1 | 1.28 |
| **July 2011** | 3 | 3.84 |
| **August 2011** | 3 | 3.84 |
| **September 2011** | 9 | 11.53 |
| **October 2011** | 7 | 8.97 |
| **November 2011** | 1 | 1.28 |
| **December 2011** | 1 | 1.28 |
| **January 2012** | 0 | 0 |
| **February 2012** | 7 | 8.97 |
| **March 2012** | 11 | 14.10 |
| **Total** | 78 | 100 |

The onset of PMLE was observed throughout the year. In this study, maximum number of cases were seen in the month of March 2011, 12 (15.38%), followed by March 2012, 11 (12.82%) followed by September 2011, 9 (11.53%), cases. Minimum number of cases was seen in the months of December 2010 and January 2012 i.e., no case.

**Table 4: Relation to occupation.**

| Occupation | Number | Percentage (%) |
|---|---|---|
| **Housewife** | 25 | 32.05 |
| **Student** | 24 | 30.76 |
| **Farmer** | 8 | 10.25 |
| **Office worker** | 15 | 19.23 |
| **Others** | 6 | 7.69 |
| **Total** | 78 | 100 |

Out of 78 cases, 25 were housewives (32.05%), 24 were students (30.76%), 8 were farmers (10.25%), 15 (19.23%) were office workers and 6 (7.69%) were engaged in miscellaneous occupations.

**Table 5: Type of clothing and PMLE.**

| Type of clothing | Number | Percentage (%) |
|---|---|---|
| **Mixed** | 29 | 37.17 |
| **Cotton** | 38 | 48.17 |
| **Synthetic** | 11 | 14.10 |
| **Total** | 78 | 100 |

The material of clothing used was of mixed type in 29 (37.17%) cases, cotton in 38 (48.17%), and synthetic in 11 (14.10%).

**Table 6: Presenting symptoms of PMLE.**

| Symptom | No. of cases | Percentage (%) |
|---|---|---|
| **Itching** | 58 | 74.35 |
| **Burning** | 2 | 2.56 |
| **Itching+burning** | 4 | 5.12 |
| **Asymptomatic** | 14 | 17.94 |
| **Total** | 78 | 100 |

Itching was the most common symptom. It was observed in 58 (74.35%), out of 78 patients. Burning sensation was present in 2 (2.56%); both itching and burning in 4 (5.12%) and 14 (17.94%) were asymptomatic.

In all the cases, sunlight was provoking the factor. None of the patients gave history of application of any cream or lotion, topically or taking any drug, systemically.

**Table 7: Time interval required for development of PMLE lesions.**

| Time interval for development of PMLE lesions | No. of cases | Percentage (%) |
|---|---|---|
| **<30 minutes** | 25 | 32.05 |
| **>30 minutes** | 10 | 12.82 |
| **Not known** | 43 | 55.12 |
| **Total** | 78 | 100 |

The time interval required to develop PMLE lesions was <30 minutes in 25 (32.05%) cases and >30 minutes in 10 (12.82%) cases. But the exact time interval was not known in 43 (55.12%) cases.

**Table 8: History of recurrence of PMLE.**

| History of recurrence | No. of cases | Percentage (%) |
|---|---|---|
| **Present** | 30 | 38. 46 |
| **Absent** | 48 | 61.53 |
| **Total** | 78 | 100 |

PMLE lesions were recurrent in 30 (38.46%) patients while no such recurrence history was given by 48 (61.53%) patients. The lesions increased in 13 (16.66%), decreased in 13 (16.66%) and no change was noted in remaining 4 (5.12%) patients.

**Table 9: Family history of PMLE.**

| Family history of PMLE | No. of cases | Percentage (%) |
|---|---|---|
| **Present** | 6 | 7.69 |
| **Absent** | 72 | 92.30 |
| **Total** | 78 | 100 |

In the present study 6 patients (7.69%) had history of similar complaints in the family.

## DISCUSSION

In this study 55 (70.5%) cases belonged to the age group between 11 and 30 years of age. People in this age group are usually more exposed to sun during their work activities and recreational activities. This may contribute to increased frequency of PMLE in this age group. The present study has agreed with the finding of most reports that young adults are the most frequently affected by PMLE.[10-12]

In the literature, the youngest reported patient was only 3 years old and the oldest was 81 years of age.[2,13] In this study youngest patient was 3years old and oldest was of 58 years of age.

Onset of PMLE during childhood (age <10 years) is seen less often.[10] In the present study 6 patients were below the age of 10 years. Recent changes in sun exposure habits, however, may contribute to the increased frequency of childhood involvement that has been lately reported.[14]

Only 4 (5.12%) cases of PMLE were reported above the age of 50 years, whereas Sharma et al also reported that only 5.90% of the patients belonged to this category as in our study.[6]

In this study, out of the 78 patients 50, (64.10%) cases were females and 28 (35. 90%) were males. The female to male ratio was found to be 1.78:1. This was consistent with earlier findings.[6,11,15-17] The female/male ratio was 2.6:1 in Italian study[18] and 3.79/1 in European study, although some investigators have reported an even higher female to male ratio (7 : 1).[10,14,19]

Female preponderance could be attributed to the recent demonstration of a female hormone, 17-β estradiol, which prevents UVR induced suppression of the contact hypersensitivity response caused by the release of immunosuppressive cytokines (IL-10) from keratinocytes.[20] Women may also be more cognizant of their skin symptoms than men, which could result in an over representation of women in clinical studies.[10]

In the present study, maximum numbers of cases were noted in the month of March followed by September. This was consistent with the results of Sharma et al.[6] Summer starts in the month of March. So people usually prefer to use light clothing with short sleeves. PMLE outbreaks occur during spring and summer as mentioned by many researchers.

Again in the September, monsoon ends and intensity of sunlight increases. This might be the reason for another peak in the month of September.

In the present study, maximum incidence was observed in housewives, comprising 32.05%. A similar observation was seen by Sharma et al.[6] In a study by Pullabatla et al manual laborers were predominantly affected by PMLE.[17] The incidence was 30.76% in students, 19.23% in office workers, 10.25% in farmers and 7.69% in others in this study.

In housewives, exposure to sunlight is usually intermittent and for a short period. Therefore no hardening occurs in them. This might be the reason housewives were predominant in number.

In the present study, maximum numbers of patients were using cotton clothing followed by mixed and synthetic. Cotton fabric had lower UV protection factor than synthetic fiber. This may explain higher incidence of PMLE with cotton clothing. But Sharma et al did not find any significant role of clothing.[6]

Itching was the most common symptom in our study. This was also observed by Sharma et al and Pullabatla et al.[6,17] Constitutional symptoms were absent in our study.

Provoking factor was sunlight in the present study for all cases. While Sharma et al reported sunlight as well as heat on open fire as aggravating factors.[6]

PMLE developed within 30 minutes in 25 cases which was consistent with reports of Sharma et al and Jansen et al.[6,21] Pullabatla et al found the time required to develop rash varied from less than 1 hour to 9 hours. It was shorter than 12 h in 54.2% of patients.[19]

History of recurrence of PMLE was noted in 30 (38. 46%) with increased severity in 13, decreased in 13 and no change in 4 patients. The reason for aggravation of lesions may be that the disease did not manifest in its complete form initially while hardening phenomenon is responsible for progressive milder symptoms.

In the present study, only 6 (7.69%) gave family history of PMLE. A family history was present in 12.7% patients in study by Guarrera.[22] According to study by Pullabatla et al it was 4% while Sharma et al found it to be 10%.[6,17] It varied from 6.25-12% in the studies conducted by Ross and Millard.[23,24]

As the disease presents with minimal symptoms, patients were not aware of similar symptoms in family members. In addition, the members of family work in different atmospheres and varying degree of sun exposure, which could be responsible for the low familial incidence.

## CONCLUSION

The following conclusions can be drawn after making the observations in the present study. The disease was found to be more in patients belonging to the second and third decades of life since people in this age group are more exposed to sun during their work activities and recreational activities.The incidence of the disease was found to be more in women probably because of

hormonal differences.The maximum number of cases were noted in the month of March when the sun exposure is high. The maximum incidence was observed in housewives, as they have short intermittent sun exposure and absence of hardening phenomenon. Higher incidence of PMLE was noted with cotton clothing as it has lower UV protection factor. Most of the patients developed PMLE lesions within 30 minutes of sun exposure. History of recurrence of PMLE was noted in 30 patients. Only 6 patients gave family history of PMLE because of milder nature of the disease along with difference in clothing and working environment.

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