



POLYMORPHIC LIGHT ERUPTION : A CLINICOEPIDEMIOLOGICAL STUDY

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ABSTRACT

Polymorphic light eruption (PMLE) is a common skin-related disorder related with exposure to sun in persons with fair skin. This study details a clinicoepidemiological profile of PMLE from a facility in northern India. A total of 100 clinically diagnosed patients of PMLE presenting over a period of one year were enrolled in the study. Demographic profile, clinical profile and histopathological assessment was done. Majority of patients were aged <30 years (54%), were females (58%). Acute onset (61%), summer season (78%), associated comorbidity (81%) – melasma being most common (23%), Majority were papular (64%), multiple in number (71%) had irregular shape (53%) and rough texture (55%). Mainly distributed on neck, face and forearm. Surrounding skin was erythematous in 66% and hypopigmented in 5% cases. HPE confirmed PMLE in 56.92% cases. Lymphocytic infiltration and orthokeratosis were the most common types (n=54) followed by spongiosis (n=29), hyperkeratosis (n=17), oedema and orthokeratosis (n=8 each).

KEYWORDS | Polymorphic light eruption (PMLE), young age, female.

INTRODUCTION

Polymorphous light eruption (PMLE), commonly known as sun rashes, is a common idiopathic photodermatoses which is characterized by a delayed abnormal response to electromagnetic radiation usually sunlight with a varied morphology of papules, plaques and vesicles on the exposed areas of the skin¹. Its prevalence is reported to vary from 5 to 20% in different populations^{2,3,4}.

It clinically manifests as erythematous papules, papulovesicles, and plaques to erythema multiforme-like lesions on sunlight-exposed surfaces. Interestingly, only one clinical form is consistently manifested in a single patient. PMLE has a substantial psychosocial impact on the patients⁵ and hence might eventually affect the quality of life of the patient.

Prevalence and epidemiology of PMLE has extensively been studied in several western studies^{6,7,8,9}, however, there have been limited studies on epidemiology and clinical characteristics of PMLE from Indian subcontinent. The present study is an attempt in that direction.

METHODOLOGY

The present study was carried out as a cross-sectional study at Department of Dermatology, Venereology & Leprosy, Era's Lucknow Medical College & Hospital, Lucknow. A total of 100 patients of photodermatoses (PMLE) during a period of one year were included in the study. Those having immunocompromised status, malignancy, Drug & Chemical induced photosensitivity and those having Dermatoses exacerbated by UVR were excluded from the assessment.

The study was approved by Institutional Ethical Committee. Informed consent was taken from all the patients. A detailed history was taken with reference to the past history of similar episodes, family history of any similar illness, mode of onset, progression of the disease, seasonal variation and the extent of the involvement.

An attempt was made to find out relation of any provocative factors like drugs, systemic illness, etc. with the disability.

A detailed general examination was carried out in all cases with particular reference to find out the distribution of skin lesions, type of skin lesions, any secondary changes.

Local examination was carried out methodically in every patient to find out the morphological features of every skin lesion. All systems were carefully examined to find out any associated abnormalities in other systems.

All the cases were clinically diagnosed as cases of photodermatoses (PMLE) were investigated as follows:

- Skin Biopsy.
- Complete Blood Count
- Urine for albumin, sugar, microscopy.

Digital Photographs were taken, after taking informed written consent. The identity of the patient was kept confidential.

RESULTS

Majority of patients were aged <30 years (54%), were females (58%), mainly students (32%) and housewives (28%). Mean BMI of patients was 21.43±3.78 kg/m². Only 11% had family history of PMLE. A total of 5 (5%) had drug allergy. History of tobacco, alcohol and/or smoking was reported by 20% patients. Majority were affected in summer (76%), however, a total of 24 (24%) were affected in winter. Maximum had <6 months' history of current illness. Burning sensation (34%), itching (34%) or both itching and burning sensation together (28%) were the presenting complaints. Majority had acute onset (61%). A total of 57 (57%) had treatment history for PMLE (Table 1).

Table 1: Demographic and Clinical Profile of PMLE Patients

SN	Characteristics	Statistic
1.	Age	
	≤20 yrs	25
	21-30 yrs	29
	31-40 yrs	19
	41-50 yrs	16
	>50 yrs	11
2.	M:F	42:58
3.	Mean BMI±SD (kg/m ²)	21.43±3.78
4.	Occupation	
	Farmer	9
	Housewife	28
	Labourer	8
	Shopkeeper	13

	Student	32
	Teacher	10
5.	Family history of PMLE	11
6.	Drug Allergy	5
7.	Addictions	
	Smoking	5
	Smoking + Alcohol	2
	Smoking + Alcohol + Tobacco	2
	Tobacco	9
	Tobacco+Smoking	2
8.	Season at presentation	
	Winter	24
	Summer	76
9.	Duration of illness	
	0-6 months	47
	7-12 months	24
	>12 months	29
10.	Presenting complaints	
	Burning Sensation	34
	Itching	34
	Itching + Burning	28
11.	Acute onset	61
12.	Treatment history for PMLE	57

Melasma (23%) was the most common associated disease. Freckles (8%), scabies (7%) and irritant contact dermatitis (5%) were some of the other common associated dermatological disorders. Acne vulgaris, burning micturition, chronic actinic dermatitis, Hansen’s disease, warts, Pityriasis alba and Tinea Corporis (n=2 each), Androgenic alopecia, bronchial asthma, lichen planus, melasma/lichen planus, onychomycosis, Pediculosis Capitis, Psoriasis vulgaris, Seborrhic dermatitis, Seborrhic Keratosis/Burning micturition, Tuberculosis and Tinea Corporis/Onychomycosis (n=1) each were some of the less common associated diseases. There were 19 (19%) cases with no associated disease.

Oral examination revealed caries (6%) and staining (31%) as the abnormal findings. Physical examination revealed pallor (6%) while pedal oedema was seen in 11% (Table 2).

Table 2: Frequency distribution of associated disease among PMLE patients

Associated disease	No of patients (n=100) (%)
Acne Vulgaris	2
Androgenic Alopecia	1
Bronchial Asthma	1
Burning Micturition	2
Chronic Actinic Dermatitis	2
Freckles	8
Hansen’s Disease	2
Irritant Contact Dermatitis	5
Lentigens	3
Lichen Planus	1
Melasma	23
Melasma, Lichen Planus	1
Warts	2
Onychomycosis	1
Pediculosis Capitis	1
Pityriasis Alba	2
Psoriasis Vulgaris	1
Psoriasis Vulgaris, Burning Micturition	3
Scabies	7
Seborrhic Dermatitis	1
Seborrhic Keratosis	3
Seborrhic Keratosis, Burning Micturition	1
Tuberculosis	1
Tinea Corporis	2

Tinea Corporis, Onychomycosis	1
Toxic Melanoderma	4
No associated disease	19

Majority of lesions were popular (64%) followed by plaque type (28%) and eczematous types (8%). Multiple lesions were more common (71%) than numerous (14%) or solitary lesions (15%). Majority of lesions were irregular (53%) and rough (55%) and mainly distributed on neck, face and forearm. Only 1 patient had lesions at feet. Surrounding skin was affected in 71%, it was erythematous in 66% and hypopigmented in 5% cases. Excoriation signs were seen in 52% cases followed by Lichenification (40%) and Eczematization (8%). A total of 11% were tender. Rise in temperature was seen in 26% cases (Table 3).

Table 3: Physical examination of PMLE patients

Physical examination	No of patients (n=100) (%)
Oral cavity	
Carries	6
Normal	63
Staining	31
Pallor	6
Pedal oedema	11
Type of lesions	
Eczematous	8
Papular	64
Plaque	28
Number	
Multiple	71
Numerous	14
Single	15
Shape	
Irregular	53
Regular	47
Surface	
Rough	55
Shiny	7
Smooth	38
Poorly defined margins	22
Distributions	
Neck + Forearm	45
Face + Neck + Forearm	25
Neck	23
Forearm	06
Feet	01
Surrounding skin	
Erythematous	66
Hypopigmentation	5
Normal	29
Presence of signs	
Excoriation	52
Lichenification	40
Eczematization	08
Tenderness	11
Raised Temperature	26

Histopathological evaluation could be done in 88% cases. It was confirmed as PMLE in 54 (56.92%) cases, in 23 (27.54%) it was confirmed as chronic non-specific dermatitis and in 11 (15.54%), it was confirmed as mild chronic dermatitis.

Histopathological changes were seen in 54 (61.36%) cases. Lymphocytic infiltration and orthokeratosis were the most common histopathological change (n=54) followed by spongiosis (n=29), hyperkeratosis (n=17), oedema and orthokeratosis (n=8 each) (Table 4).

Table 4: Biopsy & Histopathological findings of PMLE patients (n=88)

Biopsy findings	No of patients	%
Chronic non specific dermatitis	23	27.54%
Mild chronic dermatitis	11	15.54%
Polymorphic light eruption	54	56.92%

Histopathological changes		
NO SIGNIFICANT RESULT	34	38.63%
S + LI + O	29	32.95%
LI+ O+ H	17	19.31%
LI +O+ ORT + HDB	8	9.09%

S=spongiosis, H=hyperkeratosis, P=parakeratosis, ORT=orthokeratosis, HDB= hydropic degeneration of basal cells, li=lymphocytic infiltration, o=oedema

DISCUSSION

The present study showed a predominance of women at younger age (<30 years). Higher prevalence of females and predominance in first three decades of life has been stated to be the characteristic demographic profile of PMLE patients in some epidemiological studies too^{10,11}. In a previous study from India, Sharma and Basnet⁴ also reported 62.7% of their patients as females and majority (59.55%) to be below 30 years of age. Although, etiology of PMLE is stated to be multifactorial yet exposure to sunlight during young age could be the reason for this higher prevalence at younger age. In a conservative society like India, with increasing age women are traditionally destined to household jobs with outdoor sun exposure decreasing with increasing age. A high prevalence of students (32%) also supported this age related prevalence. PMLE is reportedly more common in fair skinned patients⁷, with increased exposure to sun and accumulation of melanin as protective mechanism¹² might also play a role in determining the age-associated lesser risk in older age groups. In present study only 20% patients had history of tobacco, alcohol and/or smoking habit. Although, it is recommended that these deleterious habits should be quit by the patients¹³ yet there is no clear cut-evidence supporting the association between these habits and PMLE. In present study too we did not establish these habits as the etiological factors of PMLE.

In present study, majority of patients presented during summers. The exposure to sun increases during the summers and hence there is increase in the related incidence⁴. However, some of the authors propose that incidence may decrease in summer because of adaptive skin hardening³, however, these specific findings could not be generalized in present study. On the contrary, other studies also consider summers to pose a higher risk^{14,15}. As majority of patients were females and in younger age group, that is why the proportion of those reporting <6 months of onset was higher. The findings indicated that PMLE has an impact on self esteem and social quality of life of patients prompting them to seek an early medical intervention more so in the wake of burning sensation / itching affecting the day-to-day life of the patients. Similar to our study, Pullabatl et al.¹⁶ reported the maximum duration between onset and reporting to be eight months. In present study, this gap was relatively higher primarily owing to the fact that a majority (57%) patients already had a treatment history. The fact that cosmetic outcome is also a major concern in various dermatological problems affecting the visible areas of body, and hence most of the patients sought the help of our facility as ours was a tertiary care facility.

In present study, incidence of associated dermatological disorders was quite high. Except for 19 patients not having any associated dermatological problem, others had a coexisting dermal issue with melasma being the most common. Presence of coexistent dermal issues is a characteristic finding of PMLE⁴. Most of these coexisting problems are hyperpigmentation disorders with sun exposure being the common etiological or aggravating risk factor^{17,18}.

In present study, majority had papular type of lesion (64%), multiple in number (71%) with irregular shape (53%), rough surface (55%) and well defined margins (78%). This clinical profile is in accordance with various studies from India^{3,4,16,19}. However, Baliah et al.²⁰ in a study from Southern India reported plaque type as the commonest form. These differences in clinical picture might be dependent on gradual change in level of sun exposure and skin color among other factors. The present study showed mainly face, neck and forearm as the most commonly

affected areas, thus showing mostly sun-exposed areas were affected by PMLE.

In present study, histopathological confirmation could be done in 59.92% of cases undergoing histopathological evaluation. This is slightly lesser than the 68% cases with diagnostic histopathological findings as reported by Pullabatl et al.¹⁶. PMLE is histopathologically characterized with dense perivascular lymphocytic infiltrate in the upper and mid dermis with or without liquefactive degeneration and Hyperkeratosis/atrophy/spongiosis marking the epidermal changes¹⁶. In present study, lymphocytic Lymphocytic infiltration and orthokeratosis were the most common histopathological changes reflective of PMLE. A similar histopathological picture was also reported by Murthy et al. in their study³. However, Manthale et al.¹⁹ in their study from south India reported hyperkeratosis as the major histopathological finding affecting the epidermis. The histopathological profile of the PMLE is dependent on the type being biopsied. Plaque type is related with hyperkeratosis, acanthosis, papillomatosis while patch type is associated with thinned out epidermis. Papular type is generally associated with mild hyperkeratosis and acanthosis²⁰. Thus, the clinical profile generally coincided with the histopathological picture.

The findings of present study showed that PMLE occurrence generally follows a similar clinicoepidemiological and histopathological pattern, however, slight differences might be attributable to geographical and ethnic differences and variable levels of risk exposures.

CONCLUSION

The findings of the study showed PMLE to be primarily affecting the females in younger age group with sun-exposed areas of body being the vulnerable areas. The tendency to delay the treatment at specialized centres was common in the studied population.

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