

DETERMINING THE CLINICAL AND EPIDEMIOLOGICAL PROFILE OF THE VARIOUS IDIOPATHIC PHOTO-DERMATOSES IN A PARTICULAR POPULATION

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Abstract

Background: Solar radiation is the main source of light to the world. The spectrum of solar radiation is broad, but only 2–3% of ultraviolet light (UV), approximately 32% of visible light, slightly < 66% of infrared light reach the Earth's surface. Photodermatoses represent a heterogenous group of skin disorders, caused or aggravated by UV radiation and /or visible light. Those distinct photosensitive cutaneous conditions can be classified into four main categories. Idiopathic photodermatoses refers to those photosensitive disorders which are probably auto-immunity mediated. These include polymorphous light eruption (PMLE), chronic actinic dermatitis, solar urticaria, actinic prurigo (AP) and hydroa vacciniforme (HV). **Materials and Methods:** This study was undertaken in the Department of Skin and VD, S.C.B Medical College, Cuttack, Odisha within a Period of one year from August 2013 to July 2014. All the patients attending the Skin & vp OPD, referred from other departments and cases admitted in the wards of Skin & VD department who were diagnosed with a particular idiopathic photo dermatoses. All the age groups and both sexes were included. Subjects taking systemic steroids or any photosensitizing drug were not included. The diagnosis was based on history and clinical assessment mainly, and investigations (histology, blood & urine examination) in selected cases were done to rule out other diseases (LE and Porphyrias). **Result:** The incidence of individual photo dermatoses per 100 patients ranged between 0.54 for commonly occurring disorder (PMLE) to 0.0% for the rarest disorder (HV). In our study, a total of 170 cases of idiopathic photo dermatoses were recorded over a period of one year, with their frequency being 0.61% (170 out of 28066 of all skin OPD cases). Maximum number of cases of PMLE 33.3% (51 out of 151 cases) belonged to the age group 21-30 years. Females outnumbered the males in all age group except in 41-50 years and >60 years, where equal sex incidence were seen. In CAD, most common affected age group was 51-6 years at 66.7% and males outnumbered females in all age groups. In AP, maximum number of cases (75%) belonged to the age group 11-20 years and equal sex incidence was seen. **Conclusion:** As this was a hospital based study, results may not reflect status of disease in a community and also being a tertiary care centre, most of the cases belong to geographic area away from the local population. So this study may not reflect general population, but it depicts the general trend of the disease. Hence, a study on a larger scale should be encouraged to further substantiate the above results.

INTRODUCTION

Genesis 1 (The Holy Bible), states that God said – “Let there be Light and there was light”. In such timeless prose, the ancient Hebrews described the

origin of all creations and added that ‘God divided the light from the darkness’

The term ‘light’ can be used to describe the visual sensation elicited when a portion of electromagnetic spectrum with wavelengths between 7000 and

3900Å reaches the photoreceptors of the eye. Solar radiation is the main source of light to the world. The spectrum of solar radiation is broad, but only 2–3% of ultraviolet light (UV), approximately 32% of visible light, slightly < 66% of infrared light reach the Earth's surface.^[1] The sun is responsible for the development and continued existence of life on Earth. We are warmed by infrared rays and able to see due to the visible part of the radiation spectrum. Moreover, visible light is an essential component of photosynthesis, which helps plants get energy, so necessary for man's nutrition.^[2]

On the negative side, sunlight causes deleterious acute and chronic inflammatory skin reactions, skin cancer, and photo aging, and can elicit adverse reactions to certain drugs. Although the Sun is the major source of UV and visible radiation that interacts with human skin, UV and/ or visible radiation are also emitted from common sources such as fluorescent lights, incandescent bulbs, photocopy machines, and phototherapy lamps. Thus, UV and visible radiation are a constant part of the human environment and play a role in health, disease, and therapy. Photodermatology is the study of this interaction between human skin and UV and visible radiation.^[3]

Photodermatoses represent a heterogeneous group of skin disorders, caused or aggravated by UV radiation and /or visible light. Those distinct photosensitive cutaneous conditions can be classified into four main categories:^[4]

- (i) Immunologically mediated photodermatoses (IMP, previously called idiopathic photodermatoses)
- (ii) Drug- and chemical-induced photosensitivity;
- (iii) Defective DNA nucleotide excision repair disorders; and
- (iv) Photo aggravated dermatoses (PAD)

Idiopathic photodermatoses refers to those photosensitive disorders which are probably auto-immunity mediated.^[5] These include polymorphous light eruption (PMLE), chronic actinic dermatitis, solar urticaria, actinic prurigo (AP) and hydroa vacciniforme (HV). These diseases although considered to have a common pathophysiologic basis, differ in their epidemiological, clinical and photobiological aspects.^[6]

The most common disease of this group of disorders is PMLE, as characterized by an estimated prevalence of 3–20%, a strong female predominance and a marked latitude gradient.^[7] Polymorphic light eruption is a common, intermittent, sunlight or artificial UVR-induced eruption, which is generally symmetrical, itchy, erythematous or skin-coloured, papular and non-scarring, but sometimes plaque-like, vesicular, bullous or a combination of these.^[8]

Chronic actinic dermatitis is also a rather common disorder, affecting elderly males and manifesting as an eczematous photodistributed eruption of unknown etiology.^[9]

Solar urticaria (SU) may be primary (idiopathic) or secondary to porphyrias, phototoxic drugs and

chemicals. Idiopathic SU is an uncommon wealing disorder induced by UVB, UVA and visible light, affecting mostly young females.

HV is a rare acquired photodermatosis, usually with onset in childhood, and characterized by vesicle, crust and scar formation that follow exposure to sunlight. AP is a rare sunlight-induced, extremely itchy, papular or nodular, usually very excoriated eruption of light-exposed and, to a lesser extent, covered skin. The incidence of idiopathic photodermatoses in areas with a temperate climate, is often under-appreciated because of the higher degree of perennial presence of sunlight and the prevalence of darker skin-type individuals who are seemingly more resistant to the development of sun sensitivity. No studies have been done previously in this region of our country.

MATERIALS AND METHODS

The study was conducted using 50 dry human radii collected from the Department of Anatomy, Rajah Muthiah This study was undertaken in the Department of Skin and VD, S.C.B Medical College, Cuttack, Odisha within a Period of one year from August 2013 to July 2014.

Selection criteria

1. All the patients attending the Skin & vp OPD, referred from other departments and cases admitted in the wards of Skin & VD department who were diagnosed with a particular idiopathic photodermatoses.
2. All the age groups and both sexes were included

Exclusion Criteria

1. Subjects taking systemic steroids or any photosensitizing drug were not included.

Methods: The diagnosis was based on history and clinical assessment mainly, and investigations (histology, blood & urine examination) in selected cases were done to rule out other diseases (LE and Porphyrias).

History: All the cases were Subjected to thorough history taking including age, Sex, address, occupation and marital status. Patient's present complaint, duration of Sun exposure, aggravating factors, mode of onset, progression of disease, Seasonal variation, past history & family history of similar episode were recorded.

Clinical examination: A detailed general examination was carried out in all cases with particular reference to find out the distribution of skin lesions.

Local examination was carried out methodically in each patient to find out the morphological features of the skin lesions. Details of skin lesions and the site, size, shape, color, type and secondary changes were noted. All the systems were examined to find out any associated abnormalities.

Investigations: All clinically diagnosed cases were subjected to routine investigations like complete hemogram and urine- routine & microscopical

examination. Photographs of the patients were taken after consent. In some doubtful cases special investigations like histopathological examination of the lesions were done to confirm the diagnosis. In a presumptive diagnosis of PLE, lupus serologies (antinuclear, anti-SSA, anti-SSB antibodies) and porphyrin levels in the blood, urine or stools were assessed to exclude LE & Porphyrin, respectively.

Appropriate treatment and advice regarding photoprotection was given to all patients. Data thus obtained was compiled, tabulated and statistically summarized. Information about the clinical and epidemiologic characteristics of the patients with idiopathic photosensitivity was obtained from the chart abstraction.

RESULTS

The incidence of individual photodermatoses per 100 patients ranged between 0.54 for commonly occurring disorder (PMLE) to 0.0% for the rarest disorder (HV). In our study, a total of 170 cases of idiopathic photodermatoses were recorded over a period of one year, with their frequency being 0.61% (170 out of 28066 of all skin OPD cases) [Table 1]

The most common photodermatoses which comprised 88.8% of total number of cases was Polymorphous light eruption, followed by solar urticaria- 9 cases (5.3%), Chronic actinic dermatitis – 6 cases (3.5%) and Actinic prurigo in 4 cases (2.4%) in decreasing order of frequency. No cases of Hydroa vacciniforme was found in our study period. [Table 2]

Maximum number of cases of PMLE 33.3% (51 out of 151 cases) belonged to the age group 21-30 years. Females outnumbered the males in all age group except in 41-50 years and >60 years, where equal sex incidence were seen. In CAD, most common affected age group was 51-6 years at 66.7% and males outnumbered females in all age groups. Majority of SU patients 55.5% (5 out of 9 cases) were in the age group 31-40 years and female predominance was seen in all age groups except in 41-50 years where all the patients were males. In AP, maximum number of cases (75%) belonged to the age group 11-20 years and equal sex incidence was seen. [Table 3]

In our study, 5 (3.31%) patients of PMLE and 1 (25%) of AP patient had positive family history whereas negative family history was present in all the CAD and SU patients. [Table 4]

In PMLE, housewives formed the main bulk of the population with 45(30%) patients, followed by students 36(24%), office workers were 13 (8%) whereas the less commonly affected were laboureres 9(6%), farmers at 7(5%) and unemployed 6 (4%). Persons employed in all other occupations comprised 23% of PMLE patients. Out of the 6 CAD patients, 4 (66.67%) were farmers and 2 were labourers. In Solar Urticaria, majority (5) patients were housewives, 3 were office workers and 1 patient was student. In AP,

out of the total of 4 cases, 2 (50%) were labourers and one each was a student and office worker. [Table 5] In PMLE, maximum 42 (27.8%) cases developed the lesions after short and intermittent sun exposure followed by exposure to sun for a period of 30 min – 1 hr in 31 (20.5%) cases. Gradually with increasing sun exposure the number of cases decreased. About 13 (8.6%) were not able to recollect the duration of sun exposure before the onset of the lesions. Out of the total 9 cases of SU, maximum (5) cases gave history of development of lesions within 30 minutes of sun exposure, whereas 2 patients developed the lesions of SU after 2-3 hours. 1 patient each developed the lesions after 1-2 hours and 3 – 4 hours respectively. All the CAD patients gave history of longer duration of sun exposure. Maximum cases (5 out of 6) were exposed to sun for >6 hours per day. In AP, 2 cases each gave history of sun exposure for 5-6 hours and 6-7 hours per day. [Table 6]

The present study observed in PMLE, forearm was the most common site affected, in 85 (56.3%) cases, followed by neck in 46 (30.5%) patients. Other sites affected were face in 17(11.3%), arms in 3 (2%) of patients. In CAD, maximum cases, 4 (66.67%) had involvement of face followed by V- area of chest in 3 (33%) patients. 2 (22%) patients had involvement in neck. SU was reported to be most common in the arm in 5 (83%) of patients followed by face, in 1 (17%). The most common site involved in AP in the present study was the dorsal aspect of hands which was affected in 3 out of 4 patients followed by 1 patient in forearm. [Table 7]

In the present study, many types of morphology of PMLE were recorded such as papules, plaques and Photosensitive lichenoid eruption. Some patients presented with more than one morphological types of PMLE simultaneously. The most common morphology which was found in 80 (52.98%) case was papules. Followed by plaques in 44 (29.14%) patients. 15 (9.93%) patients presented with Photosensitive lichenoid eruption. 10 (6.6%) cases have papules and plaques. 2 (1.3%) had plaques and PLE simultaneously. Most of the lesions were hypopigmented – 80(52.98%) followed by erythematous in 36(23.84%) patients. All the CAD patients presented with lichenified and hyperpigmented plaques. All the patients of SU presented with wheals confined to the sun exposed parts within minutes to few hours of sun exposure. All the cases of AP, presented with excoriated lesions, only papules 1(25%) patient, only nodules in 1(25%) case and both papules and nodules in 2 (50%) patients. [Table 8]

The present study showed in PMLE, pruritus was the chief complaint in most of the cases – 123(82%) followed by burning in 17(11%) and 11(7%) patients were asymptomatic. All the patients of AP presented with extremely pruritic lesions. Out of the 6 cases of CAD, 50% (3 out of 6) cases complained of itching, 2 (33%) of burning and 1(16.7%) patient complained of both burning and itching. 77.8% (7 out of 9) cases

of SU had itching and 2 patients complained of burning sensation on sun exposure. [Table 9]

The most common factors aggravating the symptoms of PMLE was found out to be sunlight in 69 (45.7%) patients, followed by sweat in 36(23.8%) cases. Heat from other sources like that of an open fire during cooking aggravated the symptoms in 8 (5.3%) cases, both sweat and heat from other sources in 4(2.6%),

sunlight and heat from other sources in 3 (2%), whereas 17 (11.3%) patients were not able to identify the aggravating factor. Sunlight was found out to be the aggravating factor in all patients of CAD and SU. 3 out of 4 cases of AP (75%) had sunlight as the aggravating factor and one patient was not able to identify any aggravating factor. [Table10]

Table 1: Incidence of idiopathic photo dermatoses diagnosed in our OPD in 28066 patients having various skin disorders

Diagnosis	No of cases	Percentage
PMLE	151	0.54%
SU	9	0.03%
CAD	6	0.02%
AP	4	0.01%
HV	0	0.00%
Other dermatological disorders	27896	99.4%
Total	28066	100.0%

Table 2: Distribution of idiopathic photo dermatoses according to diagnosis

Idiopathic Photo dermatoses	No of Cases	Percentage
PMLE	151	88.82%
CAD	9	5.29%
AP	6	3.53%
SU	4	2.35%
HV	0	0.00%
Total	170	100.00%

Table 3: age & sex distribution of idiopathic photo dermatoses

Age (in years)	PMLE		SU		CAD		AP	
	Male	Female	Male	Female	Male	Female	Male	Female
05-10	0 (0%)	7 (4.6%)	0 (0.0%)	0 (0.0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
11-20	11 (7.3%)	14 (9.3%)	0 (0.0%)	1 (11.1%)	0 (0%)	0 (0%)	1 (25%)	2 (50%)
21-30	21 (13.9%)	30 (19.9%)	0 (0.0%)	1 (11.1%)	0 (0%)	0 (0%)	1 (25%)	0 (0%)
31-40	14 (9.3%)	21 (13.9%)	1 (11.1%)	4 (44.4%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
41-50	11 (7.3%)	11 (7.3%)	2 (22.2%)	0 (0.0%)	1(16.7%)	0 (0%)	0 (0%)	0 (0%)
51-60	4 (2.6%)	5 (3.3%)	0 (0.0%)	0 (0.0%)	3 (50%)	1(16.7%)	0 (0%)	0 (0%)
>60	1 (0.7%)	1 (0.7%)	0 (0.0%)	0 (0.0%)	1(16.7%)	0 (0%)	0 (0%)	0 (0%)
Total	62 (41%)	89 (59%)	3 (33.3%)	6 (66.7%)	5(83.4%)	1(16.7%)	2 (50%)	2 (50%)

Table:4 family history in idiopathic photo dermatoses

Family History	PMLE		CAD		SU		AP	
	N	%	N	%	N	%	N	%
Positive	5	3.3%	0	0%	0	0%	1	25%
Negative	146	96.7%	6	100%	9	100%	3	75%
Total	151	100%	6	100%	9	100%	4	100%

Table 5: occupation wise distribution of idiopathic dermatoses

Occupation	PMLE		CAD		SU		AP	
	N	%	N	%	N	%	N	%
Housewives	45	30%	0	0%	5	56%	0	0%
Students	36	24%	0	0%	1	11%	1	25%
Office workers	13	9%	0	0%	3	33%	1	25%
Farmers	7	5%	4	67%	0	0%	0	0%
Laboureres	9	6%	2	33%	0	0%	2	50%
Others	35	23%	0	0%	0	0%	0	0%
Unemployed	6	4%	0	0%	0	0%	0	0%
Total	151	100%	6	100%	9	100%	4	2

Table 6: duration of exposure to sun in idiopathic dermatoses

Duration	PMLE		SU		CAD		AP	
	N	%	N	%	N	%	N	%
IN &/OR <30 min	42	28%	5	56%	0	0%	0	0%
30min - 1 hr	31	21%	0	0%	0	0%	0	0%
1- 2 hr	17	11%	1	11%	0	0%	0	0%
2- 3 hr	15	10%	2	22%	0	0%	0	0%
3- 4 hr	13	9%	1	11%	0	0%	0	0%

4- 5 hr	7	5%	0	0%	1	17%	0	0%
5- 6 hr	13	9%	0	0%	0	0%	2	50%
>6 hr	0	0%	0	0%	5	83%	2	50%
Unable to recollect	13	9%	0	0%	0	0%	0	0%
Total	151	100%	9	100%	6	100%	4	100%

Table 7: sites affected in idiopathic photo dermatoses

Sites	PMLE		CAD		SU		AP	
	N	%	N	%	N	%	N	%
Face	17	11.3%	4	44%	1	17%	0	0%
Neck	46	30.5%	2	22%	0	0%	0	0%
V-area of chest	0	0.0%	3	33%	0	0%	0	0%
Forearm	85	56.3%	0	0%	0	0%	1	25%
Arm	3	2.0%	0	0%	5	83%	0	0%
Back	0	0.0%	0	0%	0	0%	0	0%
Hands	0	0.0%	0	0%	0	0%	3	75%
Feet	0	0.0%	0	0%	0	0%	0	0%
Total	151	100%	9	100%	6	100%	4	100%

Table 8: morphology of lesions in idiopathic photodermatoses

Morphology	PMLE		SU		CAD		AP	
	N	%	N	%	N	%	N	%
Papules	80	53.0%	0	0%	0	0%	1	25%
Nodules	0	0.0%	0	0%	0	0%	1	25%
Plaques	44	29.1%	0	0%	6	55%	0	0%
PLE (photosensitive lichenoid eruption)	15	9.9%	0	0%	0	0%	0	0%
Wheals	0	0.0%	9	100%	5	45%	0	0%
pa+ nod (Papules and nodules)	0	0.0%	0	0%	0	0%	2	50%
pa+pl (papules and plaques)	10	6.6%	0	0%	0	0%	0	0%
pl+PLE	2	1.3%	0	0%	0	0%	0	0%
Total	151	100%	9	100%	11	100%	4	100%

Table 9: symptoms of idiopathic photodermatoses

Symptoms	PMLE		CAD		SU		AP	
	N	%	N	%	N	%	N	%
Itching	123	81.5%	3	50%	7	78%	4	100%
Burning	17	11.3%	2	33%	2	22%	0	0%
Itching+Burning	0	0.0%	1	17%	0	0%	0	0%
Asymptomatic	11	7.3%	0	0%	0	0%	0	0%
Total	151	100%	6	100%	9	100%	4	100%

Table 10: aggravating factors in idiopathic photodermatoses

AGGRAVATING FACTORS	PMLE		SU		AP		CAD	
	N	%	N	%	N	%	N	%
Sunlight	69	45.7%	9	100%	3	75%	6	100%
Sweat	36	23.8%	0	0%	0	0%	0	0%
Sunlight and sweat	14	9.3%	0	0%	0	0%	0	0%
Heat from artificial sources	8	5.3%	0	0%	0	0%	0	0%
Sweat & Heat from artificial sources	4	2.6%	0	0%	0	0%	0	0%
Sunlight & Heat from artificial sources	3	2.0%	0	0%	0	0%	0	0%
Not identified	17	11.3%	0	0%	1	25%	0	0%
TOTAL	151	100%	9	100%	4	100%	6	100%

DISCUSSION

The incidence of idiopathic photodermatoses in a country like India is often underappreciated because of the higher degree of perennial presence of sunlight and the predominance of darker skin type individuals who are seemingly more resistant to the development of sun sensitivity.^[10] The true epidemiology of idiopathic photodermatoses was not documented before in this region of our country. In our study, a total of 170 cases of idiopathic photodermatoses were recorded over a period of one year, with their frequency being 0.61% (170 out of 28066 of all skin OPD cases.)

In the present study Sunlight was the aggravating factor in 45.7% (69 cases), sweat in 23.8% (36 cases), unidentifiable in 11.3% (17), both sunlight and sweat in 9.3% (14 cases), heat of an open fire in 5.3% (8), both sweat and heat in 2.6% (4) and sunlight and heat in 2% (3) cases. These findings are almost consistent with Sharma et al,^[11] who found sunlight to be the most common aggravating factor followed by both sunlight and heat.

In our study, the prevalence of chronic actinic dermatitis was 6 out of 151 (3.97%) cases. The results are significantly lower than that of study in Athens by Stratigos et al,^[12] (2003) where CAD was diagnosed in 10.2% of all cases of idiopathic photodermatoses. The lower prevalence in our study may be attributed

to the fact that majority of patients were farmers, belonging to rural areas contributing to their lesser referral to a tertiary care centre, where our study was conducted.

Total 6 cases were diagnosed during the present study. Out of these 5 (83%) were males and only 1 patient (17%) was female. The results of our study are almost near consistent with other studies. Yap et al,^[13] (2003) conducted a study in Australian population and found predominance of the disorder in males. Males were 37 out of 44 (84.09%) and females were 7 out of 44 (15.9%). Whereas Somani et al,^[14] (2005) in Hyderabad, India found out of 9 cases, all were males. Stephansson E et al,^[15] (2011) studied the characteristics of chronic actinic dermatitis in Asian skin in a heterogeneous group of Singaporean patients and found 47 out of 58 cases (81.0%) were males and females were 11 out of 58 (19%).

The most commonly affected sites in the present study were face (66.7%), V-area of chest (50%), neck (33.3%) in decreasing order of frequency which is consistent with the results of Jansen CT et al. (2011).^[16] This may be attributed to the fact that majority of CAD patients in our study were farmers, who receive constant sun exposure to these sites perennially during field work as they don't cover these areas while working. Only one patient had involvement of back in addition to the other mentioned sites, which may be explained due to his position in relation to sun and absence of clothing in this site while working in field.

CONCLUSION

As this was a hospital based study, results may not reflect status of disease in a community and also being a tertiary care centre, most of the cases belong to geographic area away from the local population. So this study may not reflect general population, but it depicts the general trend of the disease. Hence, a study on a larger scale should be encouraged to further substantiate the above results. Last, but not the least; this study will act as a baseline over which

further and in-depth studies can be carried out, which may be beneficial from the academic and research point of view in the following years to come.

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