THYROID FUNCTION TESTS IN POLYMORPHIC LIGHT ERUPTIONS

Senthil Ganapathy¹, Dhanalakshmi Kasi², Vinothiney Krishna Moorthy³, Sindhuja Balaji⁴

¹Assistant Professor, Department of Dermatology, Thanjavur Medical College, Thanjavur, Tamilnadu, India.

²Associate Professor, Department of Dermatology, Thanjavur Medical College, Thanjavur, Tamilnadu, India.

³Postgraduate Student, Department of Dermatology, Thanjavur Medical College, Thanjavur, Tamilnadu, India.

⁴Associate Professor, Department of Dermatology, Thanjavur Medical College, Thanjavur, Tamilnadu, India.

ABSTRACT

BACKGROUND

Polymorphic Light Eruption (PMLE) is the most common, recurrent idiopathic acquired photodermatosis with female preponderance.⁽¹⁾ Polymorphic light eruption has been found to be associated with thyroid function abnormalities.

Aim- To study the clinico-epidemiological profile of polymorphic light eruptions and its association with thyroid function abnormalities.

MATERIALS AND METHODS

A prospective observational study was conducted for a period of one year from April 2017 to October 2017 in 50 patients presenting to the Outpatient Department with polymorphic light eruptions. Thyroid Stimulating Hormone (TSH), Free Triiodothyronine (FT3) and Free Tetraiodothyronine (FT4) were estimated in these patients. Inclusion criterion was patients clinically diagnosed as cases of polymorphic light eruptions. Exclusion criteria were pregnancy, lupus erythematosus, inflammatory photodermatoses, use of drugs causing photosensitivity, specific treatment of polymorphic light eruption in last 3 months.

RESULTS

The study showed a female preponderance (68%). The average age at presentation was 30 - 35 yrs. Thyroid Function Tests (TFT) showed abnormality in 40% of cases.

CONCLUSION

This study showed that hypothyroidism has significant association with PMLE.⁽²⁾ Cases of polymorphic light eruptions should be examined clinically for thyroid disorder and also tested for TFT and thyroid autoantibodies to find any association and prevent serious consequences.

KEY WORDS

Polymorphic Light Eruptions, Hypothyroidism.

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BACKGROUND

Polymorphic Light Eruption (PMLE) is the most common, abnormal, recurrent, idiopathic, acquired photodermatoses characterised by polymorphic eruptions ranging from papulovesicular lesions to large plaques, localised predominantly in a photo-exposed distribution. TFT abnormality was significantly higher among PMLE cases. Genetic basis or immune dysfunction may be the cause of both these diseases. Hence, in this study, we analysed the clinico-epidemiological profile of PMLE and its association with thyroid function abnormalities in a tertiary care hospital.

MATERIALS AND METHODS

A single centre prospective and observational study was conducted for a period of one year.

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Corresponding Author:

Dhanalakshmi Kasi,

Associate Professor,

Department of Dermatology,

Thanjavur Medical College,

Thanjavur, Tamilnadu, India.

E-mail: drkdhanalakshmi@gmail.com

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Fifty patients with PMLE of age less than or equal to 40 were included in the study after ethical committee approval. A written informed consent in the language known to them was obtained from the patient for including into the study and capturing photographs. Patients with lupus erythematosus, inflammatory photodermatoses, use of drugs causing photosensitivity, treatment for PMLE in the last 3 months and pregnant patients were excluded from the study.

A detailed history was taken with the help of a designed proforma which included information on age, gender, clinical features, onset with duration, features suggestive of thyroid disorder, treatment details and associated comorbid illnesses. A thorough clinical examination was done and arrived at definitive clinical diagnosis. All routine investigations were done along with Thyroid function tests (FT3, FT4, TSH). The data was tabulated, analysed and compared with data of other studies. The primary objective of the study was to study the clinico-epidemiological profile of PMLE and its association with thyroid function abnormalities in a tertiary care setting.

Statistical analyses of the data were performed using SPSS version STAT 8.0. Microsoft Word and Excel have been used to generate graphs, tables etc. The sample size was estimated by consulting Biostatistician. The sample size of 50 was enough to maintain the power of study to at least 80%.

RESULTS

Sex Ratio

Of the total 50 cases with Polymorphic light eruptions, 34 cases were females and 16 cases were males (Female: Male ratio was 2.1: 1).

Age Ratio

Of the total 50 cases of Polymorphic light eruptions, 31 cases were in the age group 30 - 35 years, 11 patients were in the group 35 - 40 years, 8 patients were in the age group less than 30 years.

Type of PMLE

Among 50 cases of polymorphic light eruptions, papular type of PMLE was observed in 27 cases, plaque type of PMLE in 14 cases and macular type in 9 cases.

Site of Involvement

Among 50 cases of polymorphic light eruptions, 23 cases had skin lesions over both upper limbs, 11 cases had lesions over neck, 9 cases had lesions over face, 7 cases had lesions over all these sun exposed areas.

Thyroid Function Tests

Of the total 50 cases, 29 cases had abnormal thyroid function tests suggestive of hypothyroidism and 21 cases were of euthyroid status.

Figures (1, 2, 3, 4). Shows varied Presentations of Polymorphic Light Eruptions at different Sites

DISCUSSION

Polymorphic Light Eruption (PLE) is a recurrent, delayed onset, abnormal reaction to sunlight (Or Artificial UVR Source) that resolves without scarring. There are several morphological variants, hence the term 'polymorphic.' It usually starts before 30 years of age. Fitzpatrick skin type also influences the risk of developing PMLE with the highest prevalence in people with skin type I and the lowest prevalence in people with skin type IV or higher.⁽³⁾ Polymorphic light eruption is much commoner in females. The coexistence of PLE and autoimmune thyroid disease has been observed, but the genuine association has not been confirmed. The association between PMLE and Thyroid dysfunction may be immune dysfunction or genetic in origin.

Polymorphic light eruption is believed to be a delayed-type hypersensitivity response to an UV-induced allergen (Photoallergen). This is supported by- (i) The nature of the lymphocytic infiltrate, which comprises mainly T-helper cells early on but is predominantly T-suppressor cells at 72 h and (ii) The pattern of adhesion molecule expression, which also resembles that of contact dermatitis. Previous greater sunlight exposure followed by more intermittent, less intense exposure might predispose to PLE development.

Percentages with a positive family history have ranged from 12% to 46%.⁽⁴⁾ We would expect at least 10% to 20% (the same as the general population prevalence) of relatives to have PLE. However, 15% of monozygotic twin pairs compared with 5% of dizygotic twin pairs had PLE, helping to confirm an inherited component to the predisposition to PLE.

More recently, the induction of allergic contact sensitivity to dinitrochlorobenzene after solar-stimulated irradiation of sensitisation sites has been shown to occur more easily in PMLE patients than in normal individuals,⁽⁵⁾ which suggests that sensitisation to a putative UVR-induced cutaneous antigen may also be easier during disease-induced exposure.

As little as 10 mins upto several hours of sunlight (or occasionally other UVR source) exposure produces, usually after a delay, an exposed site eruption that is often intensely itchy. Some, particularly those who only have a significant problem during sunny holidays describe a 'priming phenomenon' - the need for 2 or 3 days of initial exposure before PLE occurs. The delay after exposure before onset is usually 6 or more hours. With subsequent sunlight avoidance, the eruption usually resolves within a few days to 2 weeks of onset. Occasionally, patients describe a longer duration. Reasons for this include: (i) Unclear history causing confusion between post-inflammatory changes and the original rash; (ii) True persistence due to inadequate avoidance measures; and (iii) Secondary 'eczematisation,' particularly in atopic patients, although the possibility of contact and photocontact reactions to sunscreens should be considered.

There is evidence that in people with PLE, there is less UVR suppression of the induction phase of delayed hypersensitivity responses than in those without PLE. This may be the factor predisposing some people to the presumed autosensitisation of PLE. This would fit with the fact that people with PLE appear less prone to skin cancer than would be expected due to sunlight avoidance alone; perhaps those who show easier induction of skin antigen recognition after UVR exposure are better immunologically protected against skin cancer but more prone to PLE.

Polymorphic light eruption affects sunlight-exposed sites exclusively. The occasional exceptions to this can be explained by UV transmission through clothing. Sparing of the face and of the dorsal hands is quite common and presumably due to tolerance induced by repeated perennial UVR exposure. This is akin to the 'hardening' phenomenon,⁽⁶⁾ characterised both by the decline of PLE susceptibility after repeated sunlight exposure and for the tendency of PLE to be less troublesome towards the end of summer. Facial involvement is more commonly seen in children with PLE. PLE is generally non-scarring unless secondary excoriation is prominent.

The mixed papulovesicular type appears to be most frequent, closely followed by plaque and papular/micropapular morphologies; vesiculobullous and erythema multiforme-like variants were uncommon. An insect bite like PLE variant (Strophula), a form without a rash ('sine eruption' with a typical time course but no visible eruption) and purpuric/ haemorrhagic subtypes are rarely seen.

Sunscreen allergy and photoallergy can complicate PLE. Patients can be reassured that they are not at increased risk of developing skin cancers. In fact, they have a lower skin cancer risk than people without PLE.

The histological features of PMLE are characteristic but not pathognomonic⁽⁷⁾ and they vary with clinical presentation. In most cases there is a superficial and deep, predominantly perivascular, dermal inflammatory cell infiltrate. The cells of this infiltrate are mainly T lymphocytes, usually CD4+ in early lesions and CD8+ later. Increased numbers of epidermal Langerhans cells and dermal macrophages are also present. Additionally, it has been demonstrated that neutrophilic infiltration into the skin following UVB irradiation is deficient, leading to impaired IL-4 and IL-10 release.⁽⁸⁾ Whereas a Th2 cytokine milieu is favoured in normal skin following irradiation, a Th1 cytokine profile is favoured in patients with PMLE. Upper dermal oedema is common. It has been suggested that an absence of dermal deposits of acid mucopolysaccharides may help distinguish it from LE, but in practice this may not be useful. Some basal liquefaction is not uncommon, but is not as marked as in LE. Spongiosis may be found, especially in papulovesicular PLE. Direct immunofluorescence is negative in PLE.

Monochromator phototesting, photopatch testing, provocation testing, autoantibody screen, porphyrin screen, HLA typing and skin biopsy can be done to exclude other causes of skin eruptions and to confirm the diagnosis.

The rate of both depression and anxiety in patients with PMLE are twice that of the general population, and these rates are similar to those observed in patients with psoriasis and atopic dermatitis.⁽⁹⁾

Sun avoidance and protective measures are sufficient for most affected people. Broad-spectrum high sun protection factor sunscreens should be used and applied correctly. Prophylactic phototherapy/ photochemotherapy⁽¹⁰⁾ can also be used. Prednisolone tablets taken at the first onset of PLE in a population only affected by holiday-type exposure slightly, but significantly shortened the duration of the eruption. The use of a potent to very potent topical corticosteroid applied daily from the day before to the third day of a holiday also appears helpful for some with 'holiday-only' PLE.

Antimalarials, beta carotene, omega-3 polyunsaturated fish oil, extract of tropical fern polypodium leucotomos, Escherichia coli taken orally, and vitamin D analogue are various experimental second line therapies under trial.

Long-term immunosuppressive drugs, such as azathioprine and cyclosporin have been used for refractory cases.

CONCLUSION

PMLE patients are more prone to have thyroid disorders. All cases of PMLE need to be clinically examined for features of thyroid disorders and investigated for TFT to prevent serious consequences. Therefore, further studies with larger sample size with genetic analysis and immunological study need to be done to prove the association.

Limitations of the Study

Sample size of our study is very small.

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