A CLINICAL AND HISTOPATHOLOGICAL STUDY OF PITYRIASIS LICHENOIDES CHRONICA

Thao Phuong Vu, MD[1], Linh Thi Tran, MD[2], Nghi Huu Dinh, MD.PhD[1,2], Minh Nguyet Vu, MD.PhD[1,2], Doanh Huu Le, MD.PhD[1,2], My Huyen Le, MD.PhD[1,2,*]

ABSTRACT

Objectives: To investigate the clinical and histopathological characteristics of pityriasis lichenoides chronica (PLC).

Methods: This was a cross-sectional observational study of 90 patients diagnosed with PLC at the National Hospital Of Dermatology & Venereology from August 2023 to August 2024. All patients underwent clinical examination, medical history taking, and skin biopsies for histopathologic assessment.

Results: The average age of the patients was 19.5 ± 12.7 years, with the youngest being 4 years old and the oldest 61 years old. The 0-20 age group had the highest proportion, with 56 patients (62.2%). There were 52 male patients (57.8%) and 38 female patients (42.2%). The average duration of illness was 6.3 ± 10.5 months, with the shortest duration being 1 month and the longest 60 months. Notably, the rate of lesions on the trunk and lower limbs was higher in children than in adults, with respective rates of 91.1% (41 patients) and 71.1% (32 patients). The most common lesions were papules (100% in children, 88.9% in adults) and scales (88.9% in children, 97.8% in adults). The most common histopathological features in the epidermis were parakeratosis (93.3%) and basement membrane liquefaction (95.5%), with no significant difference between children and adults. The proportion of dermal lymphocytic infiltration was 93.3% in children and 82.2% in adults.

Conclusions: PLC is more common seen in males and in younger individuals, predominantly in the 0-20 age group. The disease follows a chronic, prolonged course. The presentations of chronic lichenoid pityriasis are quite diverse. The condition presents with polymorphic skin lesions, including papules, scaly patches, erythematous macules, and hypopigmented patches. Lesions are most commonly distributed on the trunk, upper limbs, and lower limbs. Histologically, PLC is characterized by parakeratosis, basement membrane liquefaction, and lymphocytic infiltration in the dermis.

Keywords: *Pityriasis lichenoides chronica, PLC, clinical features, histopathology.*

[1]Hanoi Medical University
[2]National Hospital of Dermatology and Venereology
Corresponding author: My Huyen Le, MD.PhD
Email: Drlehuyenmy@gmail.com
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1. INTRODUCTION

Pityriasis lichenoides (PL) is a rare group of dermatoses with unknown etiology[1], first described by Neisser2 and Jadassohn3 in 1894. The disease occurs in both children and adults,[4,5] but is more common during the first decade of life, with an estimated 19 - 38% of cases being pediatric patients.[1,6] Based on clinical presentation, PL is classified into two categories: Pityriasis lichenoides et varioliformis acuta (PLEVA) and pityriasis lichenoides chronica (PLC).[4] The PLEVA form presents with acute and explosive erythematous macules, reddish-brown papules, vesicles, progressing to central necrosis with hemorrhage, which may progress to ulceration and heal with scarring. In contrast, PLC manifests as red or brown papules covered with sparse, dirty-gray mica-like scales, which can be removed in a single sheet, developing gradually and following a chronic course without progressing to necrotic crust, and potentially leaving post-inflammatory hypopigmentation without scarring.[1]

The etiology of PL remains unclear; the disease may arise spontaneously or following viral infections or vaccinations.[7] Several hypotheses regarding its pathogenesis have been proposed, including immune complex-mediated dermatitis.[4,6-9] Additionally, some authors suggest that pityriasis lichenoides may represent a premalignant condition with the potential to progress to cutaneous T-cell lymphoma.[4,5] Therefore, accurate diagnosis, which facilitates effective treatment, requires a thorough understanding of the clinical features together with ancillary investigations and, in particular, histopathological changes associated with the disease.[10]

Among the two clinical variants of PL, PLC is generally benign and may spontaneously regress in some cases; however, it more commonly follows a chronic course, persisting for many years with a high recurrence rate, thereby compromising patients' physical and cosmeic well-being, and quality of life.[11,12]

Globally, several studies have investigated the clinical characteristics and associated factors of PLC in children, indicating that the disease in this population tends to be benign and may resolve spontaneously.[11,12,13], In clinical practice, we have also observed differences in disease course and clinical manifestations between pediatric and adult patients. However, in Vietnam, research on PLC remains limited. Therefore, we conducted this study to investigate the clinical and histopathological characteristics of PLC in both children and adults at the National Hospital Of Dermatology and Venereology from August 2023 to August 2024.

2. MATERIALS AND METHODS

2.1. Study population

A total of 90 patients with the definitive diagnosis of PLC, confirmed by histopathological examination of skin biopsy specimens, who presented at the National Hospital of Dermatology and Venereology between August 2023 and August 2024, were enrolled in the study.

Diagnostic criteria: Clinical features: Small reddish-brown papules with a central mica-like adherent scale; removal by the Brocq method is difficult, producing the "varnish plug" sign. Lesions are non-tender and typically mildly pruritic or asymptomatic. Common sites of involvement include the trunk, buttocks, arms and legs, hands, feet, face, and scalp. Upon resolution, lesions do not leave scars but may result in hyperpigmented or hypopigmented macules, which gradually fade over several months. Histopathological features: Epidermis: Parakeratosis; focal spongiosis; mild to moderate acanthosis; occasional necrotic keratinocytes and vacuolar degeneration of the

basal layer; focal lymphocytic exocytosis and scattered extravasated erythrocytes. Dermis: Dermal edema; perivascular lymphocytic infiltration at the dermo-epidermal junction; occasional erythrocyte extravasation; superficial vascular dilation without vasculitic changes.

Inclusion criteria: Patients with a confirmed diagnosis of PLC who provide informed consent to participate in the study. Exclusion criteria: Patients who do not consent to participate in the study or are unable to communicate normally.

2.2. Methodology

Study design

A cross-sectional observational study. A convenience sampling method was applied, including all patients diagnosed with PLC presenting to and receiving treatment at the National Hospital of Dermatology and Venereology from August 2023 to August 2024.

Study procedures

Patients were assessed for demographic data; medical history (internal medicine and dermatologic history); clinical characteristics including disease duration; and primary skin lesions (papules, scales, erythematous macules, crusts). A skin biopsy was performed, and histopathological examination was carried out at the Department of Dermatopathology, National Hospital of Dermatology and Venereology.

Data analysis

Data were processed using SPSS software version 16.0. Categorical variables were analyzed by counts and percentages. Continuous variables were presented as mean ± standard deviation, minimum, and maximum values. Compartive analyses between categorical variables included the Chi-square test (for expected frequency less than 5 under 20%) and Fisher's exact test (for expected frequency less than 5 over 20%) to . The Student's t-test was employed for comparing means between two normally distributed quantitative variables, and the Mann-Whitney U test for non-normally distributed quantitative variables. A p-value < 0.05 was considered statistically significant.

2.3. Ethical approval

The investigators ensured that all procedures were conducted in accordance with the Declaration of Helsinki on ethical principles for medical research involving human subjects. The study protocol was reviewed and approved by the Institutional Review Board of Hanoi Medical University and the National Hospital of Dermatology and Venereology, IRB#48/HĐĐĐ-BVDLTW on November 13, 2023. All patients were provided with a detailed explanation of the study procedures and objectives, and each signed a written informed consent form prior to participation.

3. RESULTS

3.1. General characteristics of patients with pityriasis lichenoides chronica

Table 1. General characteristics of patients with PLC (N = 90)

Characteristic	n	%
Age group		
0-20 years	56	62.2
21-40 years	25	27.8
> 40 years	9	10
Mean age ($\overline{X}$ ± SD)	19.5 ± 12.7	
Youngest age	4	
Oldest age	61	
Sex		
Male	52	57.8
Female	38	42.2
Disease duration (months)		
Mean disease duration ($\overline{X}$ ± SD)	6.4 ± 10.5	

A total of 90 patients with PLC were enrolled, comprising 45 pediatric and 45 adult cases. The mean age was 19.5 ± 12.7 years, ranging from 4 to 61 years. The 0 - 20-year age group accounted for the largest proportion, with 56 patients (62.2%). There were 52 male patients (57.8%) and 38 female patients (42.2%). The mean disease duration was 6.4 ± 10.5 months, with the earliest duration of 1 month and the longest of 60 months (Table 1).

3.2. Clinical characteristics of pityriasis lichenoides chronica

Table 2. Lesion characteristics and distribution in adults (n = 45) and children (n = 45) with pityriasis lichenoides chronica

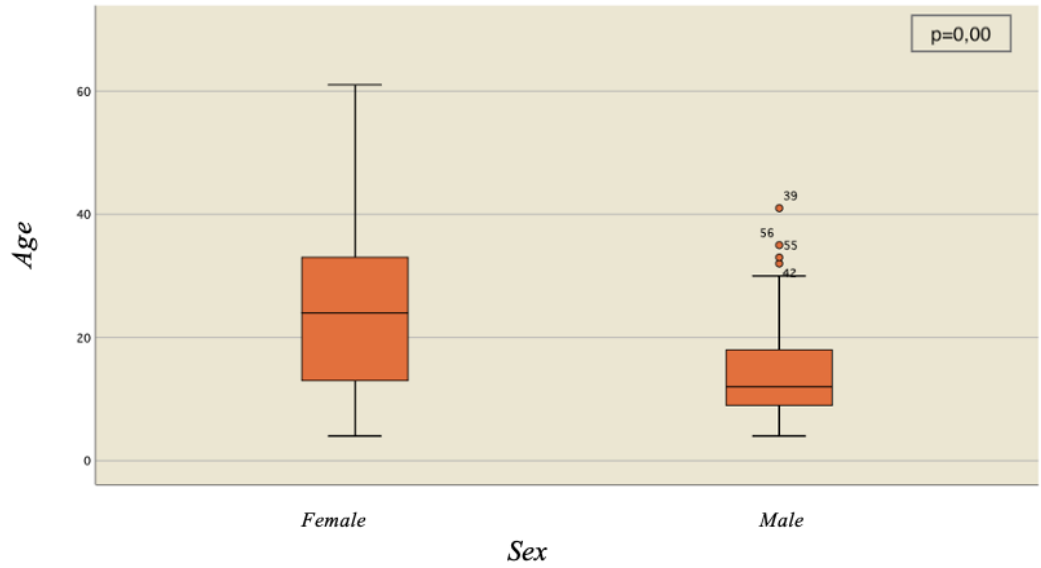
Characteristic	Children n (%)	Adults n (%)	p-value
Body part of involvement			
Head/face/neck	5 (11.1 %)	1 (2.2%)	0.203[a]
Trunk	41 (91.1%)	31 (68.9%)	0.008[b]
Upper limbs	41 (91.1%)	37 (82.2%)	0.215[b]
Lower limbs	43 (95.6%)	32 (71.1%)	0.002[b]
Skin lesion			
Papules	45 (100%)	40 (88.9%)	0.056[a]
Scales	40 (88.9%)	44 (97.8%)	0.203[a]
Erythematous macules	38 (84.4%)	40 (88.9%)	0.535[b]
Hyperpigmented macules	20 (44.4%)	18 (40%)	0.67[b]
Hypopigmented macules	30 (66.7%)	32 (71.1%)	0.649[b]
Crusts	16 (35.6%)	15 (33.3%)	0.824[b]

[a]Fisher's Exact test, [b]Chi-square test.

Among the 90 patients with PLC, there was no notable difference in mean disease duration between children (6.36 months) and adults (6.38 months). Most patients presented with disseminated lesions over the body. Lesions involving the trunk and lower limbs were more frequent in children compared to adults (91.1% vs. 68.9%, p = 0.008, and 95.6% vs. 71.1%, p = 0.002, respectively). Lesions on the head, face, and neck were observed more often in children (11.1%) than in adults (2.2%), although this difference did not reach statistical significance (p = 0.203, Fisher's exact test). Lesions on the upper limbs were present in 41 children (91.1%) and 37 adults (82.2%). Overall, the morphological characteristics of the lesions did not substantially differ between adults and children. The most common lesion types in both groups were papules (100% in children vs. 88.9% in adults, p = 0.056) and scales (88.9% vs. 97.8%, p = 0.203). The least common lesion type was crusts (35.6% vs. 33.3%, p = 0.824). Erythematous macules were observed in 38 children (84.4%) and 40 adults (88.9%).

Pigmentary alterations were also noted in both groups, without statistically significant differences. Hypopigmented macules were more frequent than hyperpigmented macules, occurring in 32 adults (71.1%) and 30 children (66.7%). Hyperpigmented macules were present in 18 adults (40.0%) and 20 children (44.4%) (Table 2).

3.3. Relationship between age and sex

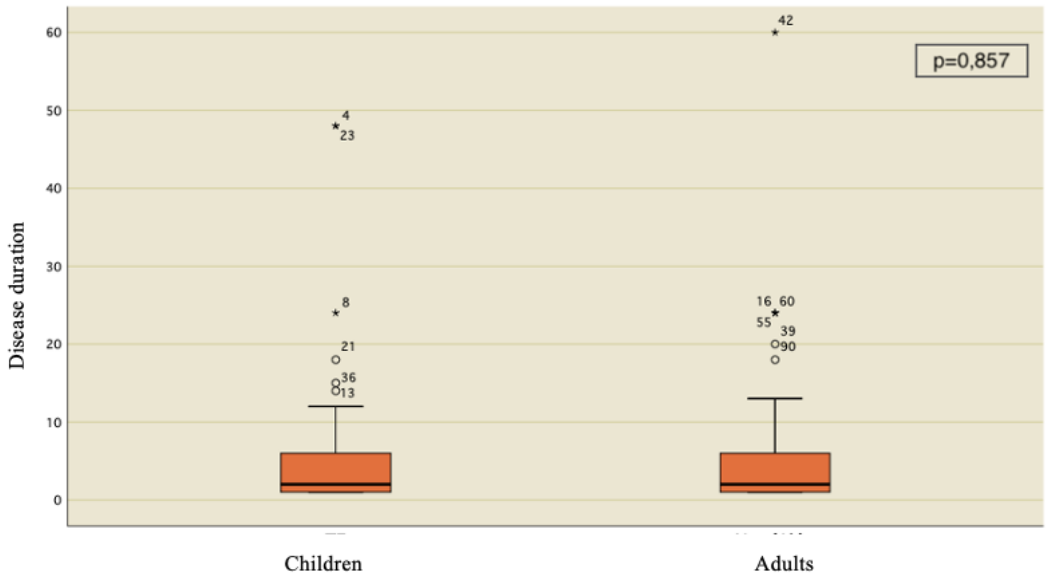


**p: Mann-Whitney test.*

Figure 1. Relationship between age and sex

In the male patient group, the mean age was 14.92 years, ranging from 4 to 41 years. In the female patient group, the mean age was 25.87 years, ranging from 4 to 61 years. The corresponding p-value was p = 0.01 (Figure 1), indicating that age dícrepancy between the male and female groups was statistically significant.

3.4. Association between disease duration in pediatric and adults



**p: Mann-Whitney test.*

Figure 2. Association between disease duration in pediatric and adults

The mean disease duration in the pediatric group was 6.36 months, ranging from 1 to 48 months. In the adult group, the mean disease duration was 6.38 months, ranging from 1 to 60 months. The corresponding p-value was p = 0.857 (Mann-Whitney test) (**Figure 2**), indicating that the difference in disease duration between children and adults was not statistically significant at the 95% confidence level.

3.5. Association between sex and lesion location

Table 3. Association between sex and lesion location

Lesion location	Male n (%)	Female n (%)	p-value
Head/face/neck	2 (3.8%)	4 (10.5%)	0.236[a]
Trunk	41 (78.8%)	27 (71.1%)	0.395[b]
Upper limbs	46 (88.5%)	32 (84.2%)	0.558[b]
Lower limbs	46 (88.5%)	29 (76.3%)	0.127[b]

[a]Fisher's Exact test, [b]Chi-square test.

Among the 90 patients included in our current study, no significant differences in lesion location were observed between males and females. The upper limbs were the most commonly affected sites in both males (46; 88.5%) and females (32; 84.2%) (p = 0.558, Chi-square test). The head/face/neck region was the least commonly affected in both males (2; 3.8%) and females (4; 10.5%) (p = 0.236, Fisher's exact test) (Table 3).

3.6. Histopathological characteristics of chronic lichenified pityriasis

Table 4. Histopathological characteristics in adults (n = 45) and pediatric patients (n = 45) with PLC

Histopathological feature	Pediatric n (%)	Adult n (%)	p-value
Epidermal changes			
Parakeratosis	41 (91.1%)	43 (95.6%)	0.677[a]
Acanthosis	35 (77.8%)	34 (75.6%)	0.803[b]
Liquefaction of basal cell layer	42 (93.3%)	44 (97.8%)	0.616[a]
Spongiosis	28 (62.2%)	30 (66.7%)	0.66[b]
Lymphocytic exocytosis	42 (93.3%)	44 (97.8%)	0.616[a]
Erythrocytic exocytosis	27 (60%)	24 (53.3%)	0.523[b]
Dyskeratosis	15 (33.3%)	22 (48.9%)	0.134[b]
Dermal changes			
Lymphocytic infiltration	42 (93.3%)	37 (82.2%)	0.108[b]
Extravasated erythrocytes	8 (17.8%)	7 (15.6%)	0.777[b]
Dilated superficial vessels	32 (71.1%)	34 (75.6%)	0.634[b]
Perivascular inflammatory infiltration	25 (55.6%)	24 (53.3%)	0.832[b]

[a]Fisher's Exact test, [b]Chi-square test.

In patients with PLC, no statistically significant histopathological differences were observed between pediatric and adult cases. Common epidermal alterations included marked parakeratosis, seen in 41 pediatric patients (91.1%) and 43 adults (95.6%) (p = 0.677); liquefaction degeneration of basal cell layer was observed in 42 pediatric patients (93.3%) and 44 adults (97.8%) (p = 0.616,); and lymphocytic exocytosis, present in 42 pediatric patients (93.3%) and 44 adults (97.8%) (p = 0.616). Additionally, acanthosis was noted in 35 pediatric patients (77.8%) and 34 adults (75.6%) (p = 0.803, Chi-square test); spongiosis in 28 pediatric patients (62.2%) and 30 adults (66.7%) (p = 0.660, Chi-square test); and extravasated erythrocytes within the epidermis in 27 pediatric patients (60.0%) and 24 adults (48.9%) (p = 0.523, Chi-square test). The least frequent epidermal change was dyskeratotic keratinocytes, observed in 15 pediatric patients (33.3%) and 22 adults (48.9%) (p = 0.134, Chi-square test). In the dermis, the most common feature was lymphocytic infiltrate, present in 42 pediatric patients (93.3%) and 37 adults (82.2%) (p = 0.108). Vascular alterations, such as dilated superficial dermal blood vessels and perivascular inflammatory infiltrate, were also relatively frequent in both groups-71.1% and 55.6% in pediatric patients, and 75.6% and 53.3% in adults, respectively. Hemorrhage, characterized by scattered extravasated erythrocytes in the dermis, was the least common dermal finding, occurring in 8 pediatric patients (17.8%) and 7 adults (15.6%) (p = 0.777, Chi-square test) (Table 4).

4. DISCUSSION

Several studies have described pityriasis lichenoides (PL) in pediatric patients,[11,13,14] but few have compared adult and pediatric cases. In our findings, 90 cases of PL were documented over a one-year period, which showed that PLC is not a rare condition in Viet Nam. Pediatric accounted for 50% of all PL patients. The male-to-female ratio in this study was approximately 1.3:1, compared with 2:1 reported in other studies.[8] Our results are consistent with previous reports, showing a male predominance in PL.

The mean age at disease onset was 19.5 ± 12.7 years, with a mean age of 9.8 years in pediatric patients and 29.2 years in adults. The youngest patient was 4 years old, and the oldest was 61 years old. This age is higher than that reported by Julie B. Zang in New York[15], who studied 75 patients and found a mean age of onset of 12 ± 13 years across both age groups. In contrast, a comparative study by Wahie16 reported a mean age of 40 years in adults and 8 years in children. The differences between our results and those of other studies may be attributable to variations in study location and time period; however, overall, the disease most commonly affects individuals in their 20s to 30s.

The mean disease duration of PLC was 6.37 ± 10.5 months, suggesting a chronic clinical course. The mean duration in pediatric patients was 6.36 months, compared with 6.38 months in adults. This finding suggests that the level of concern regarding the disease does not differ substantially between adults and children.

In both pediatric and adult patients, we observed that lesions most frequently involved the trunk and extremities, followed by the head, face, and neck. Among these, pediatric patients showed a higher prevalence of trunk and lower limb involvement compared with adults. This finding is consistent with the study by S. Wahie in the United Kingdom, which included 25 children and 32 adults and reported trunk and lower limb involvement in 23 patients (92%).[16] A study by Gelmetti in Italy[11] classified PL lesion distribution in 89 children as diffuse, central, or peripheral, and demonstrated a correlation between lesion distribution and disease prognosis. However,

similar to the study by Romani et al.[14], we did not classify lesion distribution in this manner and found no association between lesion distribution and prognosis.

Regarding lesion characteristics, the clinical manifestations of PLC include papules, scales, and hypopigmentation,[1,17] which were also the most common cutaneous findings in this study. Some features of PLEVA were also observed concurrently with chronic lesions, such as crusts and hemorrhage (albeit to a lesser extent). This suggests that PLC and PLEVA are not entirely distinct diseases, and that each variant may present with characteristic lesions of both conditions.[4,5,11,13,14]

Regarding histopathological characteristics, our study showed that parakeratosis, liquefaction degeneration of basal cell layer, lymphocytic exocytosis, and perivascular lymphocytic infiltrate were the most common findings. The frequencies of these features did not differ significantly between adults and pediatric patients in our cohort. Although spongiosis is also considered an important feature of PLC, in our study it was observed in only 28 pediatric cases (62.2%) and 30 adult cases (66.7%). In addition, all PLC cases demonstrated perivascular inflammatory infiltrate, including 25 pediatric patients (55.6%) and 24 adults (53.3%). We did not observe other vascular changes, including thrombosis of dermal vessels or fibrinoid necrosis of vessel walls, as seen in PLEVA.

5. CONCLUSIONS

PLC is common in males and in the age group of 0 - 20. The average duration of the disease lasts over 6 months. The symptoms of chronic lichenoid pityriasis are typically diverse. The most common are papules and scales. The location of lesions on the trunk and lower limbs in children is higher than in adults. Parakeratosis, liquefaction of basal cell layer, and lymphocytic infiltration are common symptoms in histopathology. PLC manifests a variety of clinical lesions. Therefore, it can be misdiagnosed in some ambiguous scenarios. Evaluation and determination of epidemiology, clinical and histopathology are really necessary for the correct diagnosis of the disease.

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