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Lichen planus in children in Kaduna, North-west Nigeria: A 20-year experience

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Abstract: *Background:* Lichen planus (LP) is a chronic inflammatory disease which mainly affects the skin but may affect mucous membranes and nails. The disease is rare in children.

Methods: Retrospective review of records of patients aged < 18 years diagnosed with LP in two dermatology clinics in Kaduna, north-west Nigeria between September 2001 and November 2021.

Results: Children constituted 11.3% (38/335) of patients diagnosed with LP: Mean age 10.3 years (range 5 – 16), 44.7% < 10 years, 63.2% male, median duration at presentation - 8 weeks. The legs (68.4%) and lower arms (50%) were the most frequently affected parts of the body. Others were: upper back (34.2%), abdomen (34.2%), lower back (27.2%), chest (23.7%), upper arms (23.7%), elbows/knees (21.1%) and flexural wrists (18.4%). The oral mucosa and genitalia were affected in one patient each. All patients presented with itching while 31.6% and 28.9% of patients presented with post-inflammatory hyperpigmentation and Koebner's phenomenon, respectively. Classic LP was diagnosed in 90% of patients. Other variants were: hypertrophic (7.9%), annular (6.3%) and on lines of Blaschko (5.3%). There was no significant gender or age-related difference in presentation. One patient was positive for hepatic C virus infection. Most patients were treated with topical corticosteroids with complete resolution of lesions in 80.8%. During follow-up, recurrence occurred in 3 patients.

Conclusion: Lichen planus is more common in Nigerian children than has been reported from many parts of the world. Its presentation is similar to that of adults, although oral and genital involvement is infrequent.

Introduction

Lichen planus (LP) is a chronic inflammatory disease affecting predominantly the skin but may affect mucous membranes of the mouth and esophagus, the genitalia and nails.[1] The classic disease has a characteristic clinical presentation consisting of itchy, multiple, well-defined, flat-topped, polygonal papules and plaques which are violaceous in color in Caucasians and light-skinned individuals but appear slate gray in those with dark skin.[2] The surface of lesions is shiny and has a characteristic fine, net-like scaling called Wickham's striae. Lesions appear mostly on the limbs and trunk but may appear on the scalp, face, palms and soles. Cutaneous LP may also present as annular, bullous, hypertrophic or linear lesions or appear on dermatomes or on the lines of Blaschko.[1, 2] Lichen planus usually lasts a few months to a year and responds well to treatment but certain variants such as hypertrophic LP may persist for longer. The oral and genital disease are often mild and asymptomatic but may be erosive and disabling and lead to a prolonged course and may be associated with malignancy.[3]Lichen planus has been strongly linked with Hepatitis C virus (HCV) infection but may also be precipitated by medications or vaccinations, and may be familial[1,2] Lichen planus has a characteristic histopathologic appearance whose major features are marked orthokeratosis, circumscribed wedge-shaped hypergranulosis, irregular saw tooth-like acanthosis of rete ridges, vacuolar degeneration of keratinocytes giving rise to Civatte bodies, and a band-like inflammatory infiltrate of lymphocytes in the upper dermis which touches or obscures the dermo-epidermal junction.[4] The precise cause of LP remains unknown but is believed to be autoimmune in origin leading to CD8 + lymphocyte-mediated destruction of basal keratinocytes - LP may be associated with other autoimmune diseases.[1,2]

Lichen planus is a fairly common disease, affecting 0.5 to 1% of the general population and it mainly affects middle-aged adults of all races: children make up only 1 – 3% of cases worldwide.[1, 2]Although LP is a frequently encountered skin disease in clinics in Nigeria and Africa, making up to 3.7% to 4.5% of cases in recent stud-

ies,[5-7] reports about the condition in children are scanty. The report by Nnoruka[8] is the only one we can find in the literature describing LP in African children. The purpose of our study is to report the relative frequency of LP in children in two dermatology clinics in Kaduna, north-west Nigeria seen over a 20-year period, and to present its clinical presentation, associations, response to treatment and outcome. We hope this will shed further light on the disease in children in Africa.

Methods

Study type and setting

The study is a retrospective review of medical records of consecutive patients with new skin disease diagnosed with LP at the skin clinics of Barau Dikko Teaching Hospital and Habbat Medical Centre, in Kaduna, Nigeria from September 2001 to November 2021. The study was approved by the Health Research Ethics Committee of Kaduna State Ministry of Health (MOH/ADM/744/ VOL.1/941). Diagnosis of LP was mainly clinical; histopathology was used to establish the diagnosis where this was uncertain. All the patients were examined by a dermatologist. The study was conducted in Kaduna, a city in the north-west region of Nigeria with an estimated population of 1.7 million.[9] It is a cosmopolitan city with a diverse population with all ethnic groups and occupations represented. It is the capital of Kaduna State. The two clinics were accessible to patients of all ages most days of the week and received referrals from within and outside Kaduna and from as far away as Sokoto 491km in the northwest of Nigeria. They came to the clinic on their own, referred by other patients or from public and private healthcare facilities and pharmacies.

Data retrieval, processing and analysis

We obtained medical records of patients who were diagnosed with LP within the study period and extracted demographic data, duration and type of disease, sites affected, symptoms associated with the disease, precipitating factors, any history of previous disease and intervals between current and previous disease and any future recurrence, what treatments were given, the outcome of treatment and duration of follow up. We routinely inquired about patients' Hepatitis B virus and HCV infection status during the first consultation and all patients were requested to perform these tests if the status was not already known; the results of these were also extracted from the records. Patients' confidentiality was strictly protected. We used IBM SPSS version 22 (Armonk, New York, USA 2013) to obtain descriptive statistics and to perform Chi-squared tests to compare differences between categorical variables. A p-value of <0.05% was considered significant.

Results

Over 20 years, 38 children (age < 18 years) were diagnosed with LP. These constituted 11.3% of 335 patients with LP seen over this period. The diagnosis was clinical in all patients except in five with lesions confined to the lower legs (two with annular lesions and three with hypertrophic lesions) in whom histological confirmation was also obtained. Table 1 shows the demographic and other characteristics of the disease in these patients. The mean age of patients was 10.3 years (range 5 – 16) and 44.7% were younger than 10 years. Almost two thirds (63.2%) were male. The disease had developed for a median duration of 8 weeks before presentation (interquartile range 12 weeks). The legs were the most frequently affected (68.4%) (fig 1a) followed by the lower arms (50%) (fig 1b). Lesions appeared on the upper back and abdomen in a third (34.2%) of patients while the lower back (27.2%), chest (23.7%), upper arms (23.7%), elbows and knees (21.1%) were also frequently affected. The neck (fig 1c) and flexural wrists were involved in 18.4% each while the thighs (fig 1d), dorsal wrists and dorsal feet and ankles were affected in about a tenth of patients. Special sites such as the oral mucosa and genitalia (the penis) was affected in one patient each. There was no nail involvement in any patient. All patients complained of itching of varying degree and almost a third of patients (31.6%) presented with post-inflammatory hyperpigmentation.

The isomorphic (Koebner's) phenomenon was observed in more than a quarter (28.9%) of patients (fig 1a). Classic LP was the commonest variant, affecting almost 90% of patients (fig 1c and 1d). Other variants such as hypertrophic LP (7.9%), annular LP (6.3%), LP on lines of Blaschko (5.3%) and bullous LP (1.6%) were much less frequent and often occurred together with the classic disease. There was no significant difference in the frequency of the various variants of the disease in both sexes and between adolescents (age 10 or more years) and younger children (age < 10). One patient each in whom result of HCV and HBsAg testing (20 patients) was available was positive for the viruses (5%). There were no other precipitating factors identified. All patients were treated with topical steroids (clobetasol propionate, fluocinolone acetonide and betamethasone valerate) while 31.6% of patients were treated with topical salicylic acid ointment in a concentration of 5 – 15%. One patient was treated with topical 1% pimecrolimus cream. Oral prednisolone (0.5 – 1mg/kg body weight) was used in almost a quarter (23.7%) of patients over a two-to-four-week period in those with extensive disease or those who did not adequately respond to topical agents initially; the latter patients all had hypertrophic LP. Oral dapsone and metronidazole were used in 4/38 (10.5%) of patients each while oral azathioprine was required to control the disease in two patients (5.3%). These patients had extensive disease and did not respond to topical and systemic steroids. All patients received oral antihistamines (chlorpheniramine, loratadine or levocetirizine) for control of itching. No patient was

treated with intralesional triamcinolone acetonide. The median duration of follow-up was 4 weeks (interquartile range 10.75 weeks). In 21/26 (80.8%) patients who returned for at least one follow-up visit, the rash had cleared while in 5/26 (19.2%), the disease was more persistent and required longer treatment including systemic therapy.

Table 1: Demographic and clinical characteristics of children with lichen planus

Characteristic	n (%)*
Age (years):	
Mean ± SD	10.3 ± 3.1
Range	5 – 16
Median	10.5
Interquartile range	4.5
Gender:	
Male	24 (63.2)
Female	14 (36.8)
Age group (years)	
5 – 7	9 (23.7)
8 -10	10 (26.3)
11 – 13	13 (34.2)
14 - 17	6 (15.8)
Sites of involvement	
Scalp	2 (5.3)
Face	4 (10.5)
Neck	7 (18.4)
Chest	9 (23.7)
Abdomen	13 (34.2)
Upper back	13 (34.2)
Lower back	91 (27.2)
Axillae/groin	-
Upper arms	9 (23.7)
Lower arms	19 (50)
Elbows/knees	8 (21.1)
Flexural wrists	7 (18.4)
Dorsal wrists	4 (10.5)
Buttocks	2(5.3)
Thighs	5 (13.2)
Legs	26 (68.4)
Ankles	4 (10.5)
Dorsal feet	4 (10.5)
Palms of hands/soles of feet	-
Involvement of special sites	
Oral mucosa	1 (2.6)
Penis	1 (2.6)
Nails	-
Associated symptoms	
Itching	38(100)
Koebner's phenomenon	11 (28.9)
Postinflammatory hyperpigmentation	12 (31.6)
Type of lichen planus:	
Classic	34 (89.5)
Hypertrophic	3 (7.9)
Annular	1 (2.6)
Lines of Blaschko	2(5.3)
Dermatomal	1(2.6)
Bullous	1(2.6)
Actinic	-
Pigmentosus	1 (2.6)
Hepatitis B and C virus serology: (n = 20)	
HBsAg positive	1 (5)
HCV antibody positive	1(5)

*Figures in parentheses are percentages

These patients also tended to have more severe disease or had hypertrophic lesions. Twelve patients (31.6%) did not return for follow-up after the first visit. The disease recurred in 3/38 (7.9%) of patients: the interval between first presentation and recurrence was nine months, four years and 12 years for each of the respective patients.

Fig 1a: Lichen planus on the legs

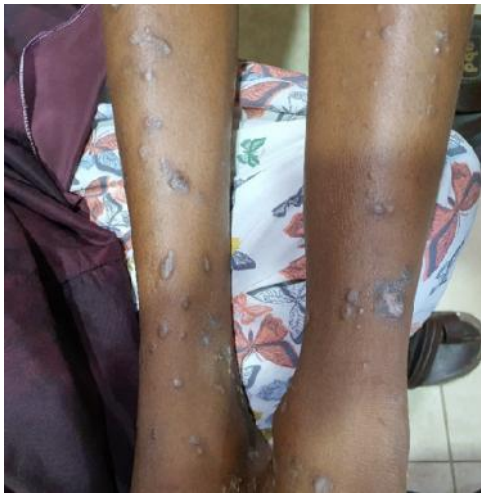


Fig 1b: Lichen planus on the arms

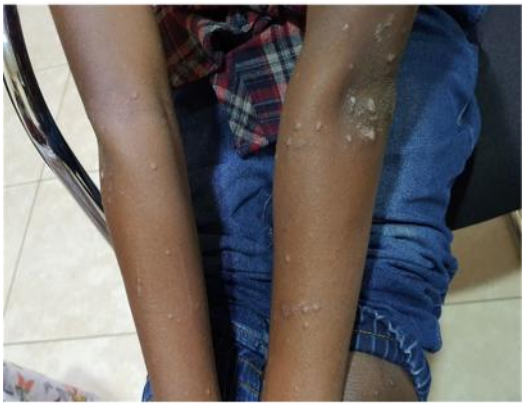


Fig 1c: Lichen planus on the neck

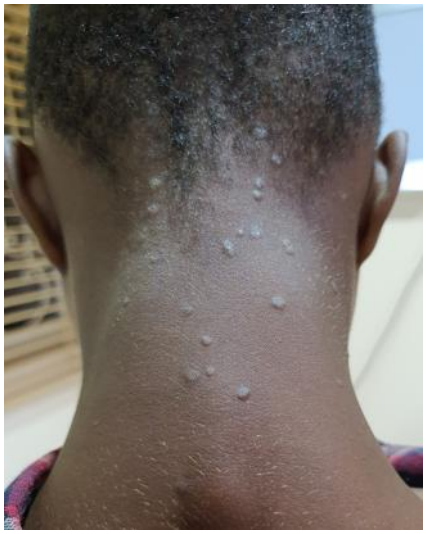
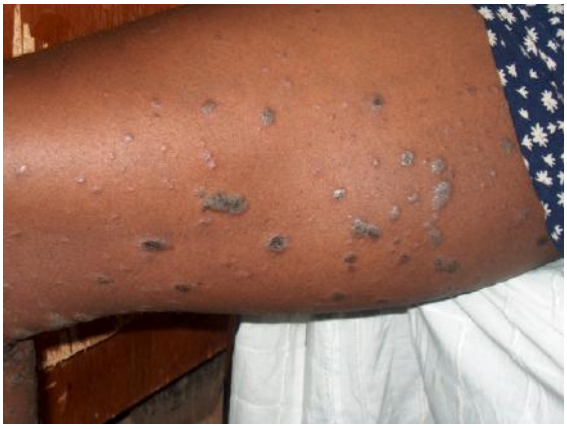


Fig 1d: Classic lesions of lichen planus on the thigh



Discussion

In 20 years of treating patients with LP, children < 18 years constituted just over 10% of patients seen at two skin clinics in Kaduna, Nigeria. Yusuf etal.[6] also reported that 29/54 (18.4%) of patients who were diagnosed with LP in their tertiary care skin clinic in Kano, north-west Nigeria, between 2011 to 2013 were below the age of 19 years. This is a marked contrast to reports from Europe, America and Australia, where LP is predominantly a disease of middle aged and older adults and affects only 1 – 3% children.[1, 2] Lichen planus, however, appears to be much less common in children in Nigeria than in India where up to 28% of patients with LP in one study were children.[10] In a recent systematic review and meta-analysis of LP in children by Merhy et al.,[11] 66.3% of the 985 patients reported in the medical literature were from India. Lichen planus also is disproportionately more common in children of Indian descent living outside India. Balasubramanian etal.[12] reported that 21/26 (80.8%) of children with pediatric LP seen over a 10-year period in a clinic in Birmingham, United Kingdom, between 1994 - 2005, were of Indian origin; people of Indian or Asian descent made up 28% of the population of the city.

It is also more frequently diagnosed in African-American children than in Caucasian children in the United States: Walton etal.[13] reported that over a period of 18 years, 36 children were diagnosed with LP in their tertiary clinic in Milwaukee with 26 (72%) being Black. African-Americans constituted 21% of the city population. This apparent higher relative prevalence of LP in Indian, African and African-American children suggests a genetic susceptibility, the nature of which is not obvious. Our study has also confirmed that LP in children affects predominantly males (63.2%) in contrast to the adult disease which affects slightly more females than males. Nnoruka[7] in a study of 13 patients with pediatric LP in a tertiary center skin clinic in Enugu, south-east Nigeria, also found 61.5% of her patients were male. This phenomenon has also been reported from other countries: the study by Merhy etal.[11] mentioned above found that 56% of children with LP reported worldwide were male. The disease is, however, similar in both sexes. It is not clear why LP in children is commoner in males than females.

Our study has documented that LP in children is otherwise identical to the adult disease[1, 2] – the classic disease is the predominant variant, affecting the limbs and torso, associated with itching in most patients, and Koebner's phenomenon and hyperpigmentation in some and responds well to topical and systemic therapy. Our findings were different, however, in other respects. We found variants of LP such as linear LP or LP on the lines of Blaschko, which were reported to be more common in children than adults - 19% of children with LP in Birmingham UK[12] and 30.8% in Enugu, Nigeria[8] - to be rare in our patients. The US study by Walton etal. mentioned above, however, reported only 3/36 (8.3%) of patients had this variant, similar to our finding. Oral and genital (penile) involvement was also infrequent in our patients (2.6% each) a finding which is consistent with the US report and a report by Bakhtiari etal. from Iran[14] in which only 2/36 (5.6%) had involvement of oral cavity.

Nnoruka had reported a higher rate of involvement of oral mucosa and genitalia: (3/13 (23.1%) and 1/13 (7.7%) respectively. We have observed a low level of oral and genital involvement in our adult patients as well (unpublished observations). Amalgam and orthodontic materials are well-known risk factors for oral LP[15]and is partly the reason why oral LP is commoner in developed countries than in developing countries;[16] the likely infrequent use of these materials in children in our population may explain the rarity of the condition. Penile LP has been reported to affect predominantly uncircumcised men, probably reflecting a Koebner's phenomenon;[17] The widespread circumcision in our region, often from infancy, may explain the rarity of penile disease in our patients. We did not find any patient with nail involvement. We also did not find any child with a family history of the disease, although up to 4% of patients with pediatric LP reported in the literature had such a history.[11] Additionally, we did not find any precipitating factor for LP in our patients. Although a strong association between HCV infection has been found in adults with LP in many studies,[18] but not others,[19, 20] this does not appear to be so in children.[11] The hepatitis C and B virus seropositivity in our patients was no different from the population from which our patients came from.[21] This is also in keeping with Nnoruka's observation that HCV is not a significant factor in her patients.[8] There was no history of autoimmune disease in our patients although such a history was present in 17% of patients in the study from the US.[13]

Conclusion

Our study is retrospective with its known limitations but is one of few studies in the literature to report on LP in children in African children. We found LP is diagnosed

in a greater number of children in Kaduna, Nigeria than has been reported worldwide, except in India; affected predominantly males unlike the adult disease; and presented with typical cutaneous disease as found in adults, except oral and genital involvement, which were rare. Our patients also responded well to topical and systemic medications. We found no strong association with other conditions such as HCV infection or autoimmune disease.

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