

Original Research Article

A clinical study on linear dermatoses at a tertiary care teaching hospital in Davangere

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ABSTRACT

Background: Skin lesions present with innumerable patterns like discoid, petaloid, arcuate, annular, polycyclic, livedo, reticulate, target, stellate, digitate, linear, serpiginous and whorled. Most of the linear lesions follow the Blaschko's lines. Aim was to study the incidence of linear dermatoses, the age and sex incidence, various types of clinical presentation, various sites of distribution and their clinical correlation.

Methods: Detailed history including family history, History of disease documented with clinical examination. After counselling and after recording their consent for the test, skin biopsy along with routine investigations was done wherever needed and the results were evaluated.

Results: Lichen striatus was seen in 29.91% followed by linear herpes zoster in 24.7%, linear lichen planus in 18.22%, linear verrucous epidermal nevus in 14.01%, segmental vitiligo in 3.73%, Nevus depigmentosus in 2.33% and others. Maximal cases were asymptomatic and reported for cosmetic reason. Intense itching was the main reason to bring the lichen planus patients and few cases of the lichen striatus patients for treatment.

Conclusions: Lichen striatus was found to be more common, female preponderance. Majority of patients showed unilateral distribution more on the extremities. Histopathological correlation shows the importance of histopathology which ultimately changes the management in any given condition.

Keywords: Linear dermatoses, Histopathology, Lichen striatus

INTRODUCTION

Linear lesions may vary in cause; being congenital or acquired; vary in morphology and can present as macules, papules, patches, plaques, vesicles or nodules; they can be inflammatory or non-inflammatory; it can be a single lesion which is linear or multiple lesions which are arranged in a linear pattern.^{1,2} The causes for occurrence in a linear pattern include lesions following Blaschko's lines, blood vessels, lymphatics and dermatomes; due to Koebner's phenomenon and auto inoculation; external factors; infestations like cutaneous larva migrans and burrows of scabies. Skin lesions present with innumerable patterns like discoid, petaloid,

arcuate, annular, polycyclic, livedo, reticulate, target, stellate, digitate, linear, serpiginous and whorled.³

Among these patterns, linearity is a pattern which attracts the attention of patients and clinicians alike. A single lesion may assume a linear shape or a number of lesions may be arranged in a linear pattern.⁴

The mechanisms or anatomical factors dictating the linearity are of the following groups:

Linear configurations determined by the course of blood vessels: thrombophlebitis, Mondor's disease, eczema related to varicose veins and temporal arteritis; linear lesions of developmental origin pigmentary demarcation

line, linea nigra, epidermal naevi, Incontinentia pigmenti and linear psoriasis, Lichen planus, Lichen striatus.

Linear lesions following dermatomal pattern herpes zoster, zosteriform nevus, Darier’s disease and zosteriform cutaneous metastases

Linear lesion due to stretching of skin is Striae

Linear lesions caused by External factors like plants, allergens, chemicals, thermal and physical factors, (Includes Koebner’s phenomenon).

Linear configurations due to other determinants 1) linear scleroderma (limb, central forehead) 2) senear–caro ridge (on hands in psoriasis) 3) dermatomyositis (dorsum of fingers; Gottron sign) 4) flagellate pigmentation due to bleomycin

Majority of the linear lesions follow the lines of Blaschko. The morphology of individual lesions, their overall pattern, their special relationship to each other and their site of distribution in the body are helpful and provide an easily recognizable clue to a rapid visual diagnosis.

Linear configuration due to course of blood vessel, nerve and lymphatics, dermatomal involvement, developmental causes, and external factors such as plants, physical factors (koebner’s phenomenon), chemicals, allergens and thermal these are responsible for linear skin lesions.

The purpose of this study was to observe the prevalence, and the clinical morphological presentations of linear dermatoses at a tertiary care teaching institute.

METHODS

Study design

This was a prospective, cross-sectional study done over a 2-year period from June 2018 to May 2020.

Study setting

Current study was conducted in the OPD of the Department of Dermatology, Venereology and Leprosy of JJM medical college, Davanagere, Karnataka.

Data collection

Inclusion criteria were linear dermatoses patients of either sex of all age groups; patients willing to give consent and those who followup regularly.

Exclusion criteria were koebner’s phenomeneon, pregnant and lactating women; patients not willing to give consent.

All patients were clinically evaluated with detailed history including family history, history of presenting illness with complete physical examination and relevant investigations. Patients who fulfilled both the inclusion and exclusion criteria were included in this study after proper counselling.

A total of 214 newly diagnosed cases of linear dermatosis were included in the study. Complete cutaneous and systemic examinations were done. Relevant investigations were performed wherever necessary. Wood’s lamp examination and digital photography of the dermatoses were taken.

CBC, platelet count, urine examination, RFT, LFT, VDRL, HBsAg, and CXR were done wherever required. Care was taken to find out associated skin disorders.

Skin biopsy for histopathology was done and special stains were used wherever necessary. After the histopathology, each slide was meticulously scrutinized and the findings were evaluated. The values in our study were qualitative, they were expressed as a percentage. Comparisons are made using chi square test.

RESULTS

Intense itching was the main reason to bring the lichen planus patients and few cases of the lichen striatus patients for treatment.

Table 1: List of various linear dermatoses.

LD details	Number	Percentage
Lichen striatus	64	29.91
Linear herpes zoster	53	24.7
Linear verrucous epidermal nevus	30	14.01
Linear lichen planus	39	18.22
Linear morphea	5	2.33
Segmental vitiligo	8	3.73
Nevus depigmentosus	5	2.33
Hypomelanosis of ito	2	0.934
Linear porokeratosis	1	0.934
Milia en-plaque	1	0.934
Linear alopecia areata	1	0.934
Bilateral verrucous epidermal nevus	1	0.934
nevus comedonicus	1	0.934
segmental nevus spilus	1	0.934
segmental nevus flammeus	1	0.934
phakomatosis pigmentovascularis type 1 a	1	0.934
linear and whorled hypermelanosis	1	0.934
nevus sebaceous syndrome	1	0.934
linear blaschkoid psoriasis	1	0.934
Total	214	100

Lichen striatus was seen in 29.91% followed by linear Herpes zoster in 24.7%, linear lichen planus in 18.22%, Linear verrucous epidermal nevus in 14.01%, segmental vitiligo in 3.73%, nevus depigmentation in 2.33% and others. Maximal cases were asymptomatic and reported for cosmetic reason. Intense itching was the main reason to bring the lichen planus and few cases of lichen striatus (Table 1).

Age and sex distribution of total cases

The study included patients from all age groups. The oldest patient was of 60 years age and the youngest was of 2 months old. Out of the total 214 patients studied, 46% were male and 56% were female. No transgender was recorded. The lesions were observed most commonly in the age group between 1 and 30 years, forming male to female ratio of 10:11. 92.3% cases showed unilateral distribution and the remaining 7.7% showed bilateral distribution.

Distribution of patients based on symptoms

Majority (64%) of the patients in the study were asymptomatic. In 29.33% patients the main symptom was pruritus.

Analysis on morphology: type of lesion

In most of the cases the primary lesions were papules in 25 patients (33.33%) followed by macules in 15 (20%), plaques in 11 (14.66%), vesicles in 5 (6.66%). Pleomorphism of lesions was observed in 14 patients (18.66%)

Table 2: Type of lesions.

S. no.	Side	No. of cases	Percentage
1	Papules	25	33.33
2	Macules	15	20
3	Plaques	11	14.66
4	Papules+plaques	9	12
5	Vesicles	5	6.66
6	Macules+papules	5	6.66
7	Others	5	6.66
	Total	75	

Linear Herpes zoster

Among the 214 patients in this group 53 (24.7%) cases presented with linear herpes zoster in the age group between 25 years and 62 years and forming male to female ratio of 35:18. The duration of disease from 2 days to one week.

Burning sensation was the commonest presentation in 36 cases, itching in 6 patients followed by pain in 11 cases respectively.

Table 3: Dermatome.

Dermatome	Frequency
T4	1
T7	2
C5, C6	2
T7, T8	6
T8	5
T6	3
T9	1
T6, T7	2
T4	2
L1	1
L2	6
T11	1
T11,T12	1
T10	1
T8,C7	1
T7, C8	1
T11	1
T11,T12	1
T10	1
C5	3
C7	2
C3	1
C7,C5	1
T5,T6	1
T4,T5	1
Trigeminal maxillary	2
Trigeminal ophthalmic	5

Lichen striatus

Among the 214 patients in this group 64 (29.91%) cases presented with Lichen striatus in the age group between 1.5 years and 36 years and forming male to female ratio of 25:39.

Table 4: Age and sex distribution among patients with Lichen striatus.

Age (yrs)	Male	Female	Total
1-10	2	9	11
11-20	12	15	27
21-30	9	13	22
31-40	2	2	4
41-50	0	0	0
>50	0	0	0
Total	25	39	64

Total 38 out of 64 patients in this group were in the age group between 1 and 20 years. 50 patients were asymptomatic and mainly came for cosmetic reasons, only 14 patients presented with itching as a symptom (Table 4).

Table 5: Sites of distribution of lichen striatus.

Sites of distribution	No. of cases
Right upper limb	13
Left upper limb	9
Right lower limb	17
Left lower limb	15
Trunk	10
Total	64

Here, 35 patients had hypopigmented macules, 8 patients had hypopigmented macules and papules, 15 patients had patches and 6 patients had macules and patches.

The lesions are distributed mainly over the extremities. The duration of the lesions ranged from 15 days to 2 years. Multiple site of distribution was noted in 5 patients on same side and the length varying from 5 cm to 20 cm. Most of these Lesions were non scaly.

Linear lichen planus

In this study group 39 patients (18.22%) presented with linear lichen planus. The age group ranged between 19 years and 60 years with mean age of 34 years. Out of the 39 cases 22 cases were males and 17 cases were females forming a male: female ratio of 1.3:1 (Table 6).

Table 6: Age and sex distribution among patients with lichen planus.

Age (years)	Male	Female	Total
11–20	1	1	2
21–30	5	7	12
31–40	7	7	14
41–50	8	2	10
>50	1	1	1
Total	22	17	39

Table 7: Sites of involvement of linear lichen planus.

Sites of involvement	Right	Left
Upper limb	6	4
Lower limb	9	9
Neck	5	
Face	6	
Total	39	

The lesions were common over the lower extremities especially the left side. 5 cases show lesions over neck and six cases shows lesions over face (Table 7). 30 out of the 39 cases, presented with itching with duration of symptom ranging from 15 days to 8 months. Twelve of them showed mucous membrane involvement, and six patients had nail changes like pitting.

All these patients had hyperpigmented, discrete, flat topped papules and plaques of size varying from 0.5-1

cm, with violaceous hue arranged in a linear pattern. The length of the lesions ranged from 5 cm -50 cm.

Linear verrucous epidermal nevus

In this study group 30 patients (14.01%) presented with Linear verrucous epidermal nevus in the age group between 16 years and 46 years and forming male to female ratio of 21:9. Total 5 out of 30 patients in the group were in the age group between 1 and 20 years. 26 patients were asymptomatic and mainly came for cosmetic reasons and only 4 patients presented with itching skin lesion. 24 patients had verrucous papules and plaques and 6 patients had skin colored velvety plaques. Maximum cases had an interrupted linear pattern of Lesions. Most of these lesions were brown to black in color.

The duration of the lesions ranges from 1 years to 5 years.

The lesions were present mainly over the head and neck. In 13 cases lesions located on face, in 12 cases lesions located on neck, two cases lesions located over the chest, and in one case lesions located over the chin. Length varying from 5 to 40 cm. Neurological and ophthalmological evaluations were normal for all patients.

Linear morphea

In this study group 5 patients of linear morphea was recorded. One case was 36 years old male with linear morphea over forehead since one year of 10 cm size. One case was 16 years old female with lesion over forehead since 9 months of 7 cm size. One case was 30 years old female with linear morphea over right upper limb since three years of 12 cm size. One case was 42 years male linear morphea over forehead since 2.5 years of 10 cm size. One case was 38 years male linear morphea over left lower limb since 3 years of 8 cm size. x-ray, ECG, EEG and neurological opinion were sought for all the patients and were found to be normal.

Linear blaschkoid psoriasis

In this study one patient was presented linear psoriasis. This case presented with erythematous scaly plaques following lines of blaschko since 3 years of duration, initially started over right leg and gradually spread to involve the neck, trunk, upper and lower extremities. There is no evidence of any trauma preceding lesions. Patient’s parents were not willing for biopsy and diagnosis was based on clinical basis.

Segmental vitiligo

In this study group 8 cases presented with segmental vitiligo between the age group 9 years and 24 years.

Four patients had patch over the trunk, one had patch over forehead, one patient had patches+macules over the neck, and other had over the back, one patient had macules over the trunk, and other had macules over the axilla region.

The lesions were isolated macules to patches of size 5 cm to 12 cm. All the lesions were unilateral in distribution. The duration of lesions varied from 7 months to 2 years. The lesions are asymptomatic in all patients. None of them had vitiligo elsewhere or any other associated autoimmune disorders. Two patients had leukotrichia over the vitiligo patches. Upon the examination of nails, four patients had longitudinal ridges in nails, one had pitting nails, and two patients had normal nails.

Hypomelanosis of ITO

In this study 2 female patients presented with Hypomelanosis of ITO. One 2-month female patient had lesions over the upper limb, and trunk. CNS, Skeletal system and eyes were found to be normal in 2 cases.

Another case was a 32 years old female who had lesions over the upper limbs and lower limbs since 12 yrs. Patient was taking treatment for seizure disorder.

One case of 26 yrs female presented with hyperpigmented dark brown colored lesion over right hand dorsum since 3 years duration.

Histopathology showed hyperkeratosis with hypogranulosis, acanthosis, and coronoid lamella with mild lymphocytic infiltrate in upper dermis.

Linear whorled nevoid hypermelanosis

A male patient presented with multiple linear and whorled hyperpigmented lesion all over the body. Echo, x-ray, EEG was normal.

Nevus depigmentosus

This condition observed in 5 cases with age ranged from 7 months to 2 years pediatric group. There are two females and 3 males. All patients presented with hypopigmented patch over the trunk since their birth.

DISCUSSION

Age and gender

A total of 214 patients presenting with linear skin lesions from all age groups were included in the study. In our study, a 25% were below the age of 20 years followed by adult age group, indicating that the linear dermatoses are common in children along with adults. A majority 80% of epidermal naevi in our study were presented at birth or within the first year of life. This finding is similar to Rogers et al study.⁵

In our study, segmental vitiligo was found to affect younger age group which is comparable with the studies by Van et al and Ratnam et al.^{6,7}

A female preponderance was observed in our study of Linear Dermatoses. This finding in our study in patients with linear morphea correlated with the study by Claudia Saad et al and Mukhapadhyay et al.^{8,9}

With Lichen striatus a similar female preponderance was observed in our study. This is similar to Kerstin T Abagge et al who observed a female: male ratio of 3: 1.10

Duration

In our study the duration of lesions in linear dermatoses was less than 1 year in 78.6% patients. This finding is not reported by other studies.

In our study the mean duration of lesions observed in patients with Lichen Striatus is 5 ½ months. This is in contrast to the observation by Carlson et al who reported a mean duration of 9 months.¹¹

Symptoms

A majority of patients with linear lesions were asymptomatic in our study, which was in comparison with Maldonado et al who observed 80% and Abagge et al who observed 66% respectively.

Family history

None of the patients with Segmental Vitiligo in our study had a family history of Vitiligo. This differed from the study by Geel N Van et al who found a positive family history.

Distribution

In our study extremities were involved in more than 50% patients with linear dermatoses i.e. patients with Lichen Striatus which was in comparison with other studies where extremity involvement was 66%, 77% respectively.

In our study, 53(24.7%) cases presented with Linear Herpes zoster in the age group between 25 years and 62 years and forming male to female ratio of 35: 18. The duration of disease from 2 days to one week. However, a study by Degreeef et al showed a majority in the age group of 51-60 years.¹² The important role of age as a risk factor for zoster is presumably related to a loss of components of VZV-specific CMI response because of aging possibly combined with waning immunity that might occur over time following initial varicella infection. Loss of specific immunity allows VZV to complete the process of reactivation and spread to the epidermis to produce the fully expressed clinical illness.¹³

In our study, herpes zoster cases have burning sensation was the commonest presentation in 36 cases, itching in 6 patients followed by pain in 11 cases respectively. In a study conducted by Sehgal et al the main presenting symptom was pain (95%) and skin eruption (91%).¹¹ Dubey et al in their study of 107 cases observed pain as the main presenting symptom 97 (90%).¹⁴ In a study conducted by Tyring et al more than 90% of the trial population had significant acute pain at presentation.¹⁵

CONCLUSION

Among the linear dermatoses, lichen striatus was found to be more common. Majority of patients showed unilateral distribution in a linear pattern, more often on the extremities. The importance of histopathological correlation is very obvious. The lesions were more of a cosmetic concern in most of the cases in this study.

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Conflict of interest: None declared

Ethical approval: The study was approved by the institutional ethics committee

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