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Original Article

Frequency and types of nail changes in patients of vitiligo

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Abstract

Background Nail involvement is frequently observed in various dermatoses including psoriasis, lichen planus, and alopecia areata. Vitiligo affects 0.1-4% of global population. It is associated with other autoimmune disorders having nail abnormalities. The frequency and nature of nail abnormalities in vitiligo are not known in our local population.

Objective To determine the frequency and types of nail changes in patients of vitiligo.

Methods This cross-sectional study was conducted in the Dermatology outpatient department of Jinnah Hospital Lahore, Pakistan for duration of six months. 240 cases of vitiligo, of both genders, ages between 15-50 years and with any duration of disease were enrolled.

Results In our study population of 240 cases, 150 cases (62.5%) of vitiligo had nail changes. 40.67% (n=61) had longitudinal ridging, 12.67% (n=19) had leukonychia, 10.67% (n=16) had absent lunula, 5.33% (n=8) had trachonychia, 4.67% (n=7) had onycholysis, 4.67% (n=7) had clubbing and 4% (n=6) had splinter hemorrhages.

Conclusion Nail changes were observed in more than sixty percent cases of vitiligo. Longitudinal ridging was the most common type of nail abnormality followed by leukonychia and absent lunula.

Key words
Vitiligo, nail changes, longitudinal ridging, leukonychia, absent lunula.

Introduction

Vitiligo is a chronic, acquired, idiopathic depigmentory disorder characterized by the presence of circumscribed white macules and patches in the skin due to the structural and functional damage to melanocytes in the epidermis.[1,2] It is the most common depigmentary disorder, affecting approximately 0.5 to 2.0 percent of the population worldwide. It occurs in all age groups and has no predilection for gender or race.[3] The disorder can be psychologically devastating and stigmatizing, especially in dark skinned individuals of our population.

The pathogenesis of vitiligo is multifactorial, including genetic influences, dysfunctional biochemical pathways, autoimmune processes, melanocyte adhesion deficits and nervous system imbalances.[3] Autoimmunity is the most widely accepted pathogenesis and involves humoral and cellular immunity. CD8 T-cells, mononuclear cells, various pro-inflammatory cytokines, and auto-antibodies appear to trigger melanocyte damage.[4,5]

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The human nail shields the distal digit from harm, assists in the picking-up of small objects, improves fine touch, and enhances the aesthetic appearance of the hands.[6] Aesthetically displeasing nails and nail-associated symptoms such as pain or throbbing are common factors that contribute to a patient's decision to seek medical attention.

Nail abnormalities are frequently observed in various dermatoses especially autoimmune skin disorders such as psoriasis and alopecia areata.[2] Vitiligo, being an autoimmune disorder is likely to show various nail abnormalities.[2]

Methods

The study was a cross sectional study and carried out in outpatient department of Dermatology Unit 1, Jinnah Hospital Lahore for a period of six months from 25th August, 2017 to 24th February, 2018. 240 patients with vitiligo of any duration, both genders and age between 15-50 years were included in the study. However patients of vitiligo with other known dermatoses having significant nail changes including psoriasis, lichen planus, atopic eczema, alopecia areata and known systemic diseases having frequent nail involvement such as connective tissue diseases (systemic lupus erythematosis, systemic sclerosis, dermtomyositis), hyperthyroidism, diabetes mellitus, renal and hepatic diseases were excluded.

Nail changes were labeled as positive if any one or more of the nail changes were seen on naked eye examination using torch and magnifying glass (10X) in any one or more of the fingers or toenails. Frequency and types of nail changes were determined and effect modifiers like age, gender and duration of disease was addressed through stratification of data.

The data was analyzed by SPSS 20. Numerical variables like age and duration of vitiligo were measured by mean and standard deviation. Categorical variables like gender and nail changes were measured by frequency and percentages. Data was stratified for age, gender and duration of vitiligo. Post stratification Chi-square test was used post-stratification with p-value ≤0.05 considered as significant.

Results

A total of 240 cases fulfilling the inclusion/ exclusion criteria were enrolled to determine the frequency and types of nail changes in patients of vitiligo.

Age distribution of the patients was done, it showed that 43.33% (n=104) of patients were between 15-30 years of age, whereas 56.67% (n=136) were between 31-50 years of age, mean±SD was calculated as 33.2±6.75 years.

Gender distribution showed that 47.92% (n=115) were male and 52.08% (n=125) were females.

Of the study population (n=240), 62.5% (n=150) patients of vitiligo had nail changes whereas 37.5 %(n=90) had no nail changes **(Figure 1)**. Frequency and types of nail changes in patients of vitiligo showed that 40.67% (n=61) had longitudinal ridging **(Figure 2)**, 12.67% (n=19) had leukonychia **(Figure 3)**, 10.67% (n=16) had absent lunula **(Figure 4)**, 5.33% (n=8) had

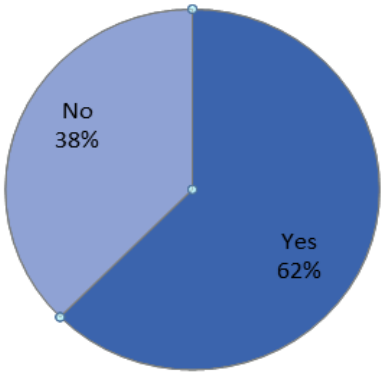

Figure 1 Frequency of nail changes in patients of vitiligo.

Figure 2 Nail showing longitudinal ridging.

Figure 3 Nail showing leukonychia.

Figure 4 Nail showing absent lunula.

trachonychia, 4.67% (n=7) had splinter hemorrhages, 4.67% (n=7) had clubbing and 4% (n=6) had splinter hemorrhages.

The data was stratified for age, gender and duration of vitiligo. Post stratification Chi-square test was used post-stratification with p-value ≤0.05 considered as significant **(Table 1-3)**.

Discussion

Nail features are an important aspect of dermatology. Nail abnormalities are indicator of various systemic diseases. Hippocrates in the fifth century described clubbing as an important clue to myriad of systemic manifestations.[7,8] Since then many more nail findings have been found to be associated with systemic diseases. Therefore, examination of the nails should be considered as an integral part of a complete dermatological examination. Clinicians must acquaint themselves with these nail findings as they can prove to be an important diagnostic tool for confirmation of systemic diseases. Furthermore, at times, some nail changes can be a presenting feature before other signs of a systemic disease become clinically apparent.

Table 1 Stratification for frequency and types of nail changes in patients of vitiligo with regards to age (n=150).

Types of nail changes		*Age (in years)*		*P value*
		15-30	*31-50*	
Longitudinal ridging (n=61)	Yes	27	34	0.000
	No	77	12	
Leukonychia (n=19)	Yes	10	9	0.09
	No	94	37	
Absent lunula (n=16)	Yes	7	9	0.01
	No	97	37	
Onycholysis (n=7)	Yes	3	4	0.11
	No	101	42	
Splinter Hemorrhages (n=6)	Yes	3	3	0.29
	No	101	43	
Clubbing (n=7)	Yes	4	3	0.47
	No	100	43	
Trachonychia (n=8)	Yes	5	3	0.66
	No	99	43	

Table 2 Stratification for frequency and types of nail changes in patients of vitiligo with regards to gender (n=150).

Types of nail changes		*Gender*		*P value*
		Male	*Female*	
Longitudinal ridging(n=61)	Yes	32	29	0.000
	No	83	6	
Leukonychia(n=19)	Yes	8	11	0.0001
	No	107	24	
Absent lunula(n=16)	Yes	8	8	0.007
	No	107	27	
Onycholysis(n=7)	Yes	3	4	0.03
	No	112	31	
Splinter Hemorrhages(n=6)	Yes	3	3	0.11
	No	112	32	
Clubbing(n=7)	Yes	4	3	0.21
	No	111	32	
Trachonychia(n=8)	Yes	4	4	0.06
	No	111	31	

Table 3 Stratification for frequency and types of nail changes in patients of vitiligo with regards to duration of disease.

Types of nail changes		*Duration (years)*		*P value*
		1-3	*>3*	
Longitudinal ridging(n=61)	Yes	29	32	0.36
	No	49	40	
Leukonychia(n=19)	Yes	11	8	0.58
	No	67	64	
Absent lunula(n=16)	Yes	6	10	0.21
	No	72	62	
Onycholysis(n=7)	Yes	5	2	0.29
	No	73	70	
Splinter Hemorrhages(n=6)	Yes	3	3	0.93
	No	75	69	
Clubbing(n=7)	Yes	4	3	0.78
	No	74	69	
Trachonychia(n=8)	Yes	4	4	0.91
	No	74	68	

With the convenience with which all 20 nails can be examined; certainly, their diagnostic significance cannot be undermined. Fingernails usually provide us more precise information than toenails, because clinical signs on toenails are often modified by trauma.

Vitiligo is associated with autoimmune disorders, particularly Hashimoto's thyroiditis and Graves' disease; other endocrinopathies, including Addison's disease and diabetes mellitus; alopecia areata; pernicious anemia; and inflammatory bowel disease. Nail abnormalities are evident in 10-66% of patients with alopecia areata. The nails may be attacked by the same inflammatory cells that target the hair follicles of alopecia areata patients. The presumed autoimmune etiology of vitiligo, and the association between vitiligo and alopecia areata, support the hypothesis that nail abnormalities should be apparent in vitiligo patients.[9]

Anectodal reports of nail abnormalities in vitiligo patients have appeared. Such abnormalities were first reported by Milligan *et al.*[10] in two vitiligo patients. Pseudo-mycotic nail dystrophy was evident and in both cases, all nails were uniformly involved (the “twenty-nail syndrome"). An association between twenty-nail dystrophy (trachyonychia) and vitiligo was

suggested by Barth *et al.*[11] in 1988. These authors described eight patients with both vitiligo and nail abnormalities, including trachyonychia, pitting, onycholysis, atrophy, and pseudo-mycotic changes, of these two patients had additional autoimmune disorders. Kandpur *et al.*[12] described three vitiligo patients who developed twenty-nail dystrophy. Nail matrix biopsies revealed focal lichenoid reactions and chronic inflammatory infiltrates in the dermal papillae and around the blood vessels. It was suggested that the association between vitiligo and twenty-nail dystrophy could be explained by the autoimmune origins of both disorders.

The frequency of nail changes in patients of vitiligo in our study showed that 62.5% (n=150) had nail changes which is in agreement with Egyptian study in year 2013 by Anbar *et al*. where nail changes were observed in 62 (68.1%) of 90 subjects with vitiligo.[9]

In our study 43.33% (n=104) of patients were between 15-30 years of age, whereas 56.67% (n=136) were between 31-50 years of age, which shows slightly higher proportion of age between 31-50years and mean age was 33.2±6.75 years. These findings are in agreement with Ilteris Oguz Topal and others[2] who recorded mean age as 34.9±16.8 years.

Regarding gender distribution, 47.92% (n=115) of patients were male and 52.08 % (n=125) were females, these findings are also in agreement with a study done by Topal *et al*.[2] in 2016 where female proportion was higher than male by calculating 51% and 49% for females and males respectively. Heightened concern about the appearance of the skin and nail may contribute to an early awareness among females.

In our study, the frequency and types of nail changes in patients of vitiligo showed that 40.67% (n=61) had longitudinal ridging, 12.67% (n=19) had leukonychia, 10.67% (n=16) had absent lunula, 5.33% (n=8) had trachonychia, 4.67% (n=7) had onycholysis, 4.67% (n=7) had clubbing and 4% (n=6) had splinter hemorrhages. These findings correspond with the study done by Topal *et al.* in Turkey in year 2016, where 78 (78%) of 100 vitiligo patients show nail changes. Of which longitudinal ridging was the most common finding (42%), followed by leukonychia (16%), an absent lunula (13%), onycholysis (5%), splinter hemorrhages (5%) and clubbing (4%).[2]

Another study done by Bodman *et al*. shows that the most common nail abnormality was longitudinal ridging (42%).[13] However, the pathogenesis remains unclear; thus, further studies are required. The second most common nail abnormality was leukonychia (16%). White spots (leukonychia punctata) are usually attributable to trauma, which is known to trigger vitiligo. Earlier studies of the nails of alopecia areata patients indicated that punctate leukonychia may be attributable to focal involvement of the distal matrix.[14]

Conclusion

Nails are a mirror to various systemic disorders. While examination of nails apart from other dermatological diseases, vitiligo should be kept in mind as nail abnormalities are frequently observed in more than 60% of the patients. However, in absence of local data and limited international studies, our findings are primary and need to be verified through further local and international studies.

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