



## Determining the Prevalence and Types of Nail Involvement in Patients with Severe Acne Vulgaris Who Referred to Clinic of Dermatology of Rasoul-e-akram Hospital During 2010-2011

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### Abstract

**Background:** Various skin diseases such as psoriasis, lichen planus, and alopecia areata can be associated with structural nail lesions. However, nail lesions prevalence in patients with severe acne vulgaris is not determined. This study aimed to determine the frequency and types of nail lesions in patients with severe acne vulgaris.

**Methods:** In this cross-sectional study, 235 patients with severe acne vulgaris were included from the clinic of dermatology of Rasoul-e-akram Hospital during the 2010-2011. The patients had no history of treatment for acne vulgaris. Patients initially underwent clinical examination, and severity of acne was determined among them. Demographic characteristics such as sex, age, and blood type, and nail disorders including brittleness, onycholysis, and leukonychia were investigated in these patients. Data were analyzed using SPSS 18 software.

**Results:** In this study, 79 (33.6%) patients with severe acne vulgaris had nail involvement and the frequency of nail lesions in this study were as follow: brittle nails 26.8% (63 cases); leukonychia 18.2% (43 cases); parrot-beaked nails 3.4% (8 cases) and onycholysis 1.3% (3 cases). Nail disorders in patients with severe acne vulgaris were not associated with sex, blood group, and the severity and distribution of acne lesions. However, the lower age of the patients was associated with the incidence of nail disorders.

**Conclusion:** According to the high prevalence of nail involvement, especially brittle nails in patients with severe acne vulgaris, investigation and treatment of nail disorders in these patients have a great importance.

**Keywords:** Nail Disorders; Acne Vulgaris; Brittle Nails

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## Introduction

Acne vulgaris is a chronic skin disease of the pilosebaceous unit specified by open and closed comedones, pustules, nodules, and cysts. It is among the most common disorders treated by dermatologists (1). Acne lesions involve face, neck, chest and back, and sometimes in extreme cases cause severe scar and deformity (2).

Nail involvement is seen in some common skin diseases. Nail lesions are divided into two main categories that include primary and secondary lesions. Secondary lesions include two categories: skin diseases like psoriasis, lichen planus, alopecia areata, etc. that create nail disorders; local and systemic diseases that cause nail dystrophy like thyroid, diabetes, anemia, etc. (3). For example, in patients with psoriasis, nail involvement has been reported about 10 to 78 percent. In this condition, the nail matrix is determined by such changes as pitting, change in the color of the nail plate, nail plate thickness, leukonychia, etc. The involvement of the nail bed is associated with onycholysis changes, oil spot, hyperkeratosis of the nail, and splinter hemorrhage (4). In severe cases of acne vulgaris, no comprehensive study has ever been performed in patients with nail involvement. However, in some reports, nail changes in patients with severe acne vulgaris has been reported as a result of drug side effects. Systemic retinoid is one of the medications in patients with severe acne that can have several side effects of which nail changes could be mentioned. Nail dystrophy, paronychia, and median nail dystrophy have been reported in the literature (5). No study exists on other nail changes associated with the use of retinoic acid and other drugs in patients with severe acne vulgaris. For this reason, this study was aimed to determine the prevalence of nail involvement in patients with severe acne vulgaris and its variants.

## Methods

This descriptive cross-sectional study was performed on the patients with severe acne vulgaris who referred to dermatology clinic of Rasoul-e-akram Hospital, and among them, 235 patients were selected by inclusion and exclusion criteria during 2010-2011. Inclusion criteria were consent to participate in the study, severe acne vulgaris, the absence of other simultaneous skin diseases, particularly skin diseases including known nail effects such as psoriasis or alopecia areata; no history of drug treatment, especially with known nail effects of drugs such as retinoic acid or doxycycline. Thus, only patients with severe acne who referred for the first time for oral agents therapy were included in the study. The use of topical acne drugs were not part of exclusion criteria. Therefore, patients with a history of oral agents therapy for acne treatment were excluded from the study because of the potential negative effects of drugs and possible changes to the nail in patients. Similarly, patients who were treated with drugs of the potential to cause nail involvement were excluded. Patients entering the clinic were first examined to determine the severity of acne on the face, chest, and back. Patients' demographic characteristics such as sex, age, as well as blood group were also determined. Patient nails were examined to determine the presence of disorders include pitting, fragility, onycholysis, leukonychia, etc. Data of each patient were recorded in the checklist and were analyzed using SPSS 18 software. Descriptive statistics including frequency, mean and standard deviation (SD) was presented. Student t-test and Chi-square were applied to the analysis.

## Results

In this study, 235 patients with severe acne vulgaris were examined that 203 (86.4%) subjects were female and the mean age of the patients was  $24.4 \pm 6.4$  years (ranged 13 to 47 years). Demographic characteristics of patients are presented in Table 1. The results of this study showed that 99% of patients had severe acne lesions on the face, 53.8% had lesions on the chest, and 60% of patients had acne lesions in the upper

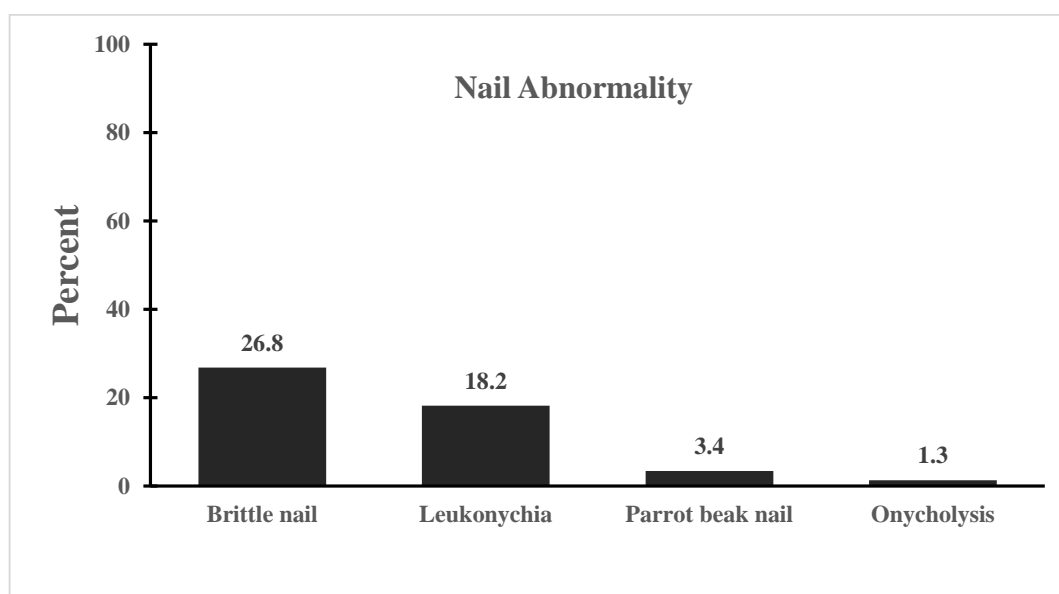
back. The mean score of the severity of acne lesions of the patients was  $4.1 \pm 1.0$  on the face,  $1.0 \pm 1.2$  on the chest, and  $1.7 \pm 1.8$  on the back. Seventy-nine (33.6%) patients with severe acne vulgaris that affected in nails. The frequency of nail disorders in the studied population was brittle nails 26.8 % (63 cases); leukonychia 18.2% (43 cases); parrot-beaked nail 3.4 % (8 cases); and onycholysis 1.3% (3 cases). Of these patients, 32 (13.6 %) individuals were simultaneously experienced brittle nails, and leukonychia and 3 (1.3%) patients simultaneously had nail involvement include leukonychia, onycholysis, and brittle nails (Figure 1).

**Table 1.** Demographic and clinical characteristics of patients with severe acne vulgaris by the presence or absence of nail lesions

Variable		Patients without lesions(n=156)	Patients with lesions(n=79)	Total number (n=235)	P-value
Sex	Male	(68.7%) 22	(31.3%) 10	(13.6%) 32	0.76
	Female	(66.0%) 166	(34%) 69	(86/4%) 203	
Age (year)		$25.2 \pm 5.7$	$23.0 \pm 7.3$	$24/4 \pm 6/4$	0.01
Blood group (ABO)	A	(28.8%) 45	(25.3%) 20	(27.7%) 65	0.34
	B	(21.1%) 33	(20.3%) 16	(20.9%) 49	
	O	(41.0%) 64	(50.6%) 40	(44.3%) 104	
	AB	(9.0%) 14	(3.8%) 3	(7.2%) 17	
Rh <sup>+</sup>		(86.5%) 135	(84.8%) 67	(86%) 202	0.71
Severity of acne disorders		$7.0 \pm 2.8$	$6.3 \pm 2.9$	$6.9 \pm 2.8$	0.64

Among female patients, 69 (34%) patients had nail involvement. Thus, the sex of patients was not related to nail disorders ( $P=0.76$ ).

However, nail involvement was significantly associated with age; so that, the mean age of patients with nail disorders ( $23.0 \pm 7.3$  years) was lower than other patients ( $25.2 \pm 5.7$  years,  $P= 0.01$ ).



**Figure1.** The distribution of nail disorders in patients with severe acne vulgaris

The association between ABO and Rh blood groups in patients with nail involvement was not observed ( $P=0.71$ ). The severity of acne lesions in different parts of the body was not a relationship with nail involvement in the patients. Thus, the total score of the severity of lesions in patients with nail disorders was  $6.8\pm 2.9$ , and it was  $7.0\pm 2.8$  in the other patients ( $P=0.64$ ).

## Discussion

Some skin diseases such as psoriasis, lichen planus, and alopecia areata can be associated with nail disorders (6).

There are some reports of the incidence of nail lesions in patients with severe acne vulgaris, but such nail disorders were mainly because of drug treatments such as isotretinoin and doxycycline (5,7,8). However, there is no comprehensive study on the prevalence of nail lesions in patients with severe acne vulgaris, who were not under drug treatment.

In the present study, the prevalence of nail lesions in patients with severe acne vulgaris was investigated. In this study, 235 patients with a mean age of 24.4 years and the sex ratio of female to male equivalent to 6.3 to 1 were included. Nail lesion in the study population was 33.6 percent. It is slightly higher than the population nail involvement. The prevalence of nail involvement in psoriasis patients was reported 10% to 50% (6), but nail changes in psoriasis are much more specific than the findings of this study; as onycholysis, pitting, and oil spot disorders are among common symptoms associated with psoriasis (6,9). However, our result indicated that the brittle nail is the most common nail disorder in patients with severe acne vulgaris which its prevalence in this population was 26.8%.

The brittle nail is the division of the distal plate into layers or the detachment of the outer layers of the nail plate in the distal part which the prevalence is increased as the result of frequent contact with water and the constant use of nail varnish cleaners, especially in women. The capacity of the connection of brittle nails with water is lower than normal nails. It could be due to the disorders of keratin, proteins associated with keratin or lipid content (10). The prevalence of brittle nail in the population is mentioned up to 20 percent (11), which is less than the amount found in patients with severe acne vulgaris. Thus, it may be possible to consider brittle nail as one of nail changes associated with severe acne vulgaris, but regarding the lack of control group in this study, any comment on this issue will be a bit difficult.

Leukonychia is another common disorder in patients with severe acne vulgaris that the prevalence of which in these patients was 18.2 percent. Similarly, brittle nails were seen in about half of cases with leukonychia. Leukonychia is also known as white spots, seen as white spots or lines on the nail plate. This relatively common condition is often created by slight damage to the nail matrix. These spots may appear on the lunula or nail plate and may disappear spontaneously or may be driven out with nail growth (6). Prevalence of leukonychia in patients without skin diseases has been reported 11.8% (12), which is slightly lower than the rate of leukonychia in patients with severe acne vulgaris.

The parrot-beaked nail is another nail disorder as too much nail curvature of the free edge of the nail in a symmetrical form that can lead to the atrophy of finger pulp either as a primary or secondary disease. The prevalence of primary deformity in society is unclear because the disorder will be ignored with trimming the nails. The secondary parrot-beaked nail is commonly seen in the trauma of fingers (13). The parrot-beaked nail disorder prevalence in our study was 3.4% among patients with severe acne vulgaris. However, given the uncertainty about the true extent of its spread in the society, it cannot be compared to the population, and no association with acne vulgaris would be possible.

Onycholysis or painless separation of the nail plate from its bed can have different etiologies, including psoriasis, trauma, infection (*Candida* or *Pseudomonas*), drugs, PUVA, photochemotherapy, exposure to

chemicals, softening of the nails as the long-term effects of moisture, and allergic contact dermatitis. These findings can also be seen along with thyroid disease (6). Onycholysis prevalence in patients with severe acne vulgaris was 1.3%. In a study in 2012 on changes in the skin and nails of patients with renal disease, onycholysis prevalence was reported 13.1 percent (14). In another study on patients with psoriasis, the prevalence of this nail disease has been reported up to 78% (15). By comparing these values, we can conclude that onycholysis is not among common nail disorders in severe acne vulgaris and probably there is no connection between these two disorders.

Nail disorders in patients with severe acne vulgaris were not related to sex, blood group, and the intensity and distribution of acne lesions in the body of the patients, but lower age was associated with the occurrence of nail disorders in patients. However, it is reported that in patients with psoriasis nail involvement in addition to patient age was significantly related to disease severity (16). Given that all of the patients in this study were in severe stages of acne vulgaris and patients with moderate and mild acne vulgaris were not included in present study, no judgment is possible based on the severity and extent of acne lesions in these people and its relationship with nail lesions.

## **Conclusion**

Based on the results of this study, the prevalence of nail disorders in patients with severe acne vulgaris is 33.6 percent which the most common disorders include brittle nails (26.8 percent), leukonychia (18.2 percent), and parrot-beaked nail (3.4 percent). The incidence of nail disorders in these patients is inversely related to age but is not related to the sex of the patients, their blood group, and acne size.\

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## **Authors Contribution**

All the authors equally contribute in this study

## **Conflicts of Interest**

There was no conflict of interest in this study

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