

Leukonychia is the most common nail change in *Alopecia areata* patients: A retrospective study in 207 patients

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Abstract

Aim: *Alopecia areata* is an auto-immune skin disease characterized by non-scarring hair loss. Nail changes are strongly associated with prognosis. In patients with *Alopecia areata*, the nail examination should not be neglected for an optimal follow-up.

Material and Methods: A retrospective study involving 207 patients with *Alopecia areata* was undertaken in a tertiary hospital between April 2016 and May 2017. Patients whose nail changes were registered in the database were included in the study. Gender, age, disease severity, sites affected, and nail changes of those patients were noted.

Results: 114 patients (55%) had nail involvement. The most common nail finding was leukonychia (n = 84). Nail pitting was detected in 29 patients. 11 patients had both leukonychia and nail pitting. The mean age of the patients with leukonychia was 23.3, while the mean age of nail pitting patients was 31.7 and the mean age of the patients without nail change was 34.1.

Conclusion: Leukonychia is the most common nail change in this study, as a different finding from all previous studies.

Keywords: *Alopecia Areata*; Nail Changes; Leukonychia.

INTRODUCTION

Alopecia areata (AA) is an autoimmune, non-scarring, hair loss disease. Not only scalp, the mainly involved site, all hair-bearing areas can be affected in AA. There is a lymphocytic infiltrate of T-cells against an unknown stimulus around the hair follicle, destroying the hair growth cycle, so the hair loss occurs (1).

AA has a wide spectrum of clinical picture ranging from a small alopecic patch to *Alopecia universalis* which is total loss of hair in whole body. Extent of alopecia also determine the basic of classification in AA (2).

Nail changes are common feature of AA with an average prevalence of 30% including pitting, trachyonychia, Beau's lines, onychorrhexis, nail thinning or thickening, onychomadesis, punctate or transverse leukonychia, red spot lunulae, and koilonychias. Among these, nail pitting and trachyonychia are reportedly the most common ones (3,4).

As the severity of *Alopecia areata* increases, nail findings becomes more frequent. Nail changes in AA indicates

a poor prognosis which means progression of hair loss and unresponsiveness to the treatment. It is thought that inflammatory cells targeting the hair follicles acts also on the nails because the nail is structurally similar to hair (5,6).

AA is seen more frequently before age of 20 years, and, nail changes are more common in young patients compared to adults. (7).

In this study, we examined the presence of various nail changes in 207 AA patients according to disease form, age and sex, and compared them with the current literature.

MATERIAL and METHODS

We conducted a retrospective study in *Alopecia areata* patients admitted to Dermatology Department of Karabuk Research and Training Hospital between April 2017 and May 2018. Patient data were obtained from the hospital database. Patients whose nail changes were registered in the database were included in the study. Gender, age, disease severity, affected sites, and nail changes of patients were noted. Only the changes in the fingernails

Received: 13.03.2019 Accepted: 29.03.2019 Available online: 04.04.2019

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were noted because the toenails may be influenced by many other factors apart from Alopecia areata-related abnormality. Same dermatologist examined all patients clinically for hair and nail changes. Patients with nail mycoses were excluded.

Patients with patchy lesions, a partial loss of scalp and beard hair were accepted in mild form, while Alopecia totalis, A.universalis and A. ophiasis in severe form.

Local ethics committee approved our study that it is compatible with provisions of the declaration of Helsinki.

Student t-test and Ki square were used as statistical analysis.

RESULTS

A total of 207 patients were included in the study. Male/female ratio was 2.04/1 (139 males/68 females). The mean age of patients was 28.84 ±14.42 (range 4-73) (Table 1). The mean age of female patients was 28.13 ± 14.06 years and the mean age of male patients was 29.26 ± 14.64 years (p> 00.5). The number of patients under 18 years old was 45 (21.7%), (range 4-17) while the number of patients 18 and older was 162 (Range 18-73) (78.3%).

Alopecia areata severity was mild in 96.6% of patients(n=200). Only 3.3% of patients (n=7) had severe Alopecia areata.

Nail changes were observed in 114 (55 %) of the patients. The most common change was leukonychia (73.6%). 29 (25.4%) patients had nail pitting with 11 of them also leukonychia. Other nail changes were horizontal grooves (n=4), onychomadesis (n=3), prominent longitudinal ridges (n=3), brittle nails (n=2) (Table 2).

Gender	Number of patients		Mean age ±SD	P value
	Mild-M*	Severe		
Male n=139	133	6	29.26 ± 14.64	p>0.05
Female n=68	67	1	28.13 ± 14.06	
Total	200	7	28.84 ±14.42	

Mild-to-moderate form

Nail change + / -	Severity mild/severe	Mean age	P value
Nail change + n=114	108/6	24.71±13.89	P<0.01
Nail change - n=93	92/1	34.01 ±13.47	
Total = 207	200/7		

114 patients with nail changes have a mean age of 24,71±13.89. The mean age of 93 patients without nail changes was 34.01 ±13.47. These results show that nail changes are significantly more common in younger patients (p<0.001).

According to the gender, 43 female patients (63.2%) had nail changes with a mean age of 24.4 ±11.89 and 71 male patients (51%) had nail changes with a mean age of 24.9±14.97 (p>0.05). There was no statistical difference between genders and their ages regarding nail changes.

54.5% of mild- cases had nail changes whereas 85.7% of severe cases had nail changes. Of severe AA cases, 6 were males whereas only one was female.

Nail changes were observed in 78 of 162 (48%) patients older than 17 years, and 37 of 45 (82%) patients younger than 18 years (p<0.01). Among these nail changes, leukonychia was the most common change and was seen in 55 patients (33.9%) older than 17 years, and in 29 patients (64.4%) younger 18 years. The incidence of leukonychia in patients under 18 years was significantly higher (p=0.01) (Table 3).

Nail change	No. 18- yo and over (n= 162)	No. under 18- yo (n=45)	P value
Leukonychia	55	29	P<0.01
Nail pitting	19	10	
Horizontal grooves	2	2	
Onychomadesis	2	1	
Prominent longitudinal ridges	3	-	
Brittle nails	1	1	
Total	82	43	125*

***11 patients have both leukonychia and nail pitting**

DISCUSSION

Our results confirms that AA is predominantly a disease of the young age and generally presents as mild form. The mean age of our patients was 28.8 and 96.6% of them was mild AA (4.7-9).

There is no consensus about gender predominance of AA in the literature. Some studies reported a female predominance but studies from Turkey, Sri Lanka and India revealed similar high male/female ratios similar to our study. The male predominance in these studies may be associated with male patients who have beard –area involvement (10-12).

Because nail changes are a prognostic indicator, it is important to examine nails of patients with AA. The incidence of nail changes in AA patients was reported as 7-66% (13). This incidence was as high as 55% in our study. This high rate may be due to the inclusion of childhood age group whose nail involvement was too high in our study (82.2%).

It was detected in this study that AA patients with nail changes were statistically younger than those without nail changes. AA also has a more severe course in younger patients. Since the nail changes are parallel to the severity of the disease, nail changes are expected to be common in younger people. As a matter of fact, many studies have found a higher rate of nail change in severe AA patients. The most frequent nail change encountered in severe AA including childhood age group is nail pitting (6,14,15). In our study, nail pitting was the most common nail change that we detected in our severe AA patients. Nail pitting is the most common nail finding in psoriasis which is another commonly seen auto-immune skin disease and is directly proportional to disease duration and severity (16).

There was no difference in nail change rates between male and female patients in this study. Lundin et al reported that AA was seen more frequently in women. In parallel, the proportion of women with nail involvement was higher in this study, unlike our study (17).

Saray and Gulec have found 18% nail pitting and 16% leukonychia in a case-control study from a similar geographic area in Turkey. Mean age and disease severity are also similar to our study, but the frequency of nail pitting and leukoplakia in this study is different from our data (18). The possible reason is that we have 45 patients who are under 18-years old unlike that study which, it has no childhood group patient.

64.4% of our AA patients under the age of 18 had leukonychia, while 33% of AA patients who are over 18-year old had that nail change. Again from Turkey, Dogan et al reported 12.3% nail changes in their 89 childhood patients, only two of them were leukonychia (19). These results are very different from our findings.

We have found less nail changes in our AA patients over the age of 40. Tan et al. also emphasized very few nail changes in the older age AA patients (20). Lazzarini detected only 3 nail changes in their 30 AA patients aged over 50. Only one was nail pitting (21).

Although the most common nail change seen in AA patients was nail pitting in many studies (6,14,15,22,23), we, in our study, observed that leukonychia as the most common change.

Many studies concerning nail changes in AA don't emphasize that leukonychia is a common nail finding except a few (3). Roest et al reported leukonychia is one of them common findings seen in their AA patients, but they also stated that leukonychia was also seen in control group (24).

Could these little white spots be missed or is it possible that the alopecia patients in those studies have improved their leukonychia spots during the examination? Perhaps, authors who don't mention much from leukonychia could suppose leukonychia is completely unrelated to AA.

Another reason for leukonychia predominance in our study could be that vast majority of patients included was in mild form AA.

Because nail pitting reportedly correlates the severity of the disease. However, our study had only 7 severe cases which might show different.

Leukonychia is histopathologically characterized by the presence of numerous parakeratotic cells throughout the entire thickness of the nail plate. White spots are seen as the keratohyalin granules, a barrier to solar radiation, carried by parakeratosis. The mechanism that brought about this situation is still not very clear. This condition may be a result of the prolongation of the inflammatory process in the disease (25,26). It is possible that inflammation has been effecting hair and nail that have same ectodermal root.

The changes observed in our AA patients other than nail pitting and leukonychia were not as rich as in the literature: Horizontal grooves (n=4), onychomadesis (n=3), prominent longitudinal ridges (n=3) and brittle nails (n=2). Hedge et al also reported only three nail changes in their 75 AA patients by using dermoscopy. Those nail changes were nail pitting, leukonychia and rigding (27).

As to limitations of the study, there was not a follow-up period, so the nail changes could not be followed according to disease condition, and the patients who have not nail change records were not included in the study. There are significant differences probably for the population being studied.

CONCLUSION

In conclusion, male patients with AA were much more than female patients, and mild cases of AA are more common. Nail changes are associated with disease severity, and male patients are prone to have severe *Alopecia areata* and so the nail changes. We have also found a noticeable outcome which is leukonychia as the most common nail change in AA patients, different from previous studies. In addition, leukonychia is much more common in younger AA patients.

Competing interests: The authors declare that they have no competing interest.

Financial Disclosure: There are no financial supports

Ethical approval: Karabük University. 04.07.2018 / 7-7.

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