Nail Diseases: A Study of 1973 Cases

Tırnak Hastalıkları: 1973 Olguyu İçeren Bir Çalışma

Ahu Yorulmaz, Basak Yalcin

Ankara Numune Research and Education Hospital, Department of Dermatology, Ankara, Turkey

ABSTRACT

Background: The nail is a horny structure covering the tips of the digits. This semihard ectodermal skin appendage not only protects the distal phalanx, but also assists fine motor activities and enhances the sensitivity of the fingertips. Nail diseases continue to be one of the frequent causes of dermatology consultations. However, current literature on the prevalence of nail diseases in general populations is still limited.

Objective: To estimate the prevalence of nail diseases among outpatients of a dermatology clinic and to determine factors associated with nail diseases.

Methods: A total of 1973 patients [850 men and 1123 women; mean age, 42.1 ± 17.9 years (range: 18–100 years)] were prospectively enrolled. Following a thorough dermatological examination, nail findings of the patients were recorded. Mann-Whitney U and χ2 tests were used for statistical analysis, with a significance threshold of \( p < 0.05 \).

Results: Nail abnormalities/diseases were observed in 560 of 1973 patients (28.4%). The most frequently observed nail abnormalities/diseases were onychomycosis (27.5%), leukonychia (8.6%) and splinter hemorrhages (7.9%). A Mann-Whitney U test showed that there was a significant relationship between age and prevalence of nail abnormalities/diseases (\( p < 0.001 \)). In addition, there was statistically significant relationship between gender and prevalence rates of nail abnormalities/diseases (\( p < 0.001 \)).

Conclusions: We have demonstrated positive associations between a number of factors and prevalence of nail diseases. Further studies are required to support these findings.

Key Words: Nail diseases, prevalence, dermatology outpatient clinic

Received: 04.20.2018 Accepted: 08.06.2018

ÖZET

Giriş: Tırnak parmak uçlarını kaplayan keratinize bir yapıdır. Bu yarı sert ektdoderal deri eki, sadece distal falanksları korumakla kalmaz, aynı zamanda ince motor aktivitelere gerçekleştirilmişesinde ve parmak uçlarının duysal hassasiyetinin korunmasına önem taşır. Tırnak hastalıkları en sık dermatolojik muayene sebeplerinin başında gelmektedir. Ancak, literatürde genel populasyonda tırnak hastalıklarının sıklığı ile ilgili yeterli veri mevcut değildir.

Amaç: Bu çalışma ile dermatoloji polikliniğine başvuran olgularda tırnak hastalıklarının prevalansının ve tırnak hastalıklarının gelişimini etkileyen faktörlerin ortaya konması hedeflenmiştir.

Yöntem: Çalışma kapsamında 1973 hasta [850 erkek ve 1123 kadın; ortalsama yaş, 42.1 ± 17.9 yıl (dağılım: 18–100 yıl)] prospektif olarak değerlendirildi. Ayrıntılı dermatolojik muayene ardından hastaların tırnak bulguları kaydedildi. İstatiksel analizde Mann-Whitney U ve χ2 testleri kullanıldı, \( p < 0.05 \) olan değerler istatistiksel olarak anlamlı kabul edildi.

Bulgular: 1973 hastanın 560'sında (%28.4) tırnak hastalığı tespit edildi. En sık tespit edilen tırnak bulgusu onikomikoz (%27.5) idi, bunu lökonişi (%8.6) ve splinter hemoraji (%7.9) takip etmektediydi. Mann-Whitney U testi yaş ve tırnak hastalıklarının gelişim sıklığını arasında anlamli ilişki olduğunu ortaya koydu (\( p < 0.001 \)). Ayrıca, cinsiyet ve tırnak hastalıkları prevalansını arasında istatistiksel açıdan anlamli ilişki mevcuttu (\( p < 0.001 \)).

Sonuç: Bu çalışmaya çok sayıda faktör ile tırnak hastalıklarının prevalansı arasında anlamli ilişki olduğunu göstermiştir. Bu bulguların desteklenmesi için ilerleyici çalışmalara ihtiyaç vardır.

Anahtar Sözcükler: tırnak hastalıkları, prevalans, dermatoloji poliklinik

Geliş Tarihi: 20.04.2018 Kabul Tarihi: 06.08.2018
INTRODUCTION

The nail is a specialized skin appendage with an intricate structure and unique properties. Nail carries a significant cosmetic impact. But in addition to its aesthetic aspect, the nail has the important function of protecting the distal phalanges and enhancing delicate movements of the distal digits (1-3). Despite the considerable current knowledge about the structure of the nail unit, little attempt has been made to investigate the prevalence of nail diseases in general populations. This study was conducted to determine the prevalence of and factors associated with nail diseases amongst people attending a tertiary dermatology outpatient clinic in Turkey.

MATERIALS and METHODS

A total of 1973 patients [850 men and 1123 women; mean age, 42.1 ± 17.9 years (range: 18–100 years)] were prospectively enrolled in the present study in a period of 18 months. Patients were consecutively selected from our outpatient dermatology clinic after accepting study participation. The study was conducted according to the principles of the Declaration of Helsinki and was approved by the medical ethical committee of our institute. Each patient provided written informed consent prior to study inclusion. The only study inclusion criterion was being 18 years of age or older.

The statistical analysis was performed using SPSS software (version 20; SPSS Inc., Chicago IL, USA). Descriptives and frequencies were calculated for variables related to demographic and clinical characteristics of patients. Mean, standard deviation and range were computed for the continuous variable, which was age. Associations between qualitative variables were tested by Chi-square (χ2) or Fisher’s exact test. In addition, the Mann–Whitney U test was used to determine whether there were significant differences in prevalence rates of each nail disease between age groups. A detailed history regarding the present dermatological disease, accompanying diseases, current medications was elicited and recorded. If the admission was related to a nail disease, it was noted. Patients were classified into four groups according to age: less than 35 years old (Group A), 35-55 years old (Group B), 55-65 years old (Group C) and over 65 years old (Group D).

Dermatological diseases were categorized into 17 groups: acne and related diseases, cutaneous infections including, viral, bacterial, parasitic, and fungal skin diseases, contact dermatitis, urticaria and angioedema, pruritus and pruritic dermatoses, psoriasis and related diseases, lichen planus and lichenoid disorders, other inflammatory dermatoses, including seborrheic dermatitis, pityriasis rosea and etc., connective tissue diseases, blistering dermatoses, cutaneous lymphomas, drug reactions, pigmentation disorders, hair disorders, neoplastic changes, dermatoses resulting from physical factors and nail disorders. For each patient, all fingernails and toenails were evaluated in a thorough dermatological examination. Nail abnormalities and diseases were recorded as follows: onychomycosis, traumatic nail diseases, median canaliform nail dystrophy, nail psoriasis, nail lichen planus, contact dermatitis induced nail changes, periungual wart, onychocrptosis, onychophagia/onychotillomania, subungual hematomata, pincer nail, melanonychia striata, onychogryphosis, periungual pyogenic granuloma, subungual fibroma, spoon nail, drug induced nail pigmentation, Beau’s lines, splinter hemorrhages, pitting, leukonychia, paronychia, onychomadesis, pseudomonas nail infection, erythronychia, anonychia, dystrophic nail and nail fragility (onychorrhexis onychoschizia) (Figure 1-3).

RESULTS

40% of the patients (n=790) were in the age group of A, 33.9% (n=668) were in the group B, 14.1% (n=279) were in the group C and 12% of the patients (n=236) were in the group D. Accompanying diseases were recorded in 753 of 1973 patients (38.2%), and a medication history was reported by 679 of 1973 patients (34.4%). Table 1 shows the frequencies of accompanying diseases in the study group. Nail abnormalities/diseases were observed in 560 of 1973 patients (28.4%). In 160 of 1973 patients (8.1%) admission was related to a nail abnormality or a disease. Frequencies of nail abnormalities/diseases in the study group were demonstrated in Table 3.

Table 1: Frequencies of accompanying diseases in the study group

| Disease Category                      | n   | %  |
|--------------------------------------|-----|----|
| Cardiovascular diseases              | 241 | 32 |
| Neuropsychiatric diseases            | 96  | 12.7|
| Endocrine diseases                   | 166 | 22 |
| Gastrointestinal diseases            | 49  | 6.5|
| Pulmonary diseases                   | 42  | 5.6|
| Renal diseases                       | 19  | 2.5|
| Infectious diseases                  | 16  | 2.1|
| Solid and hematologic malignancies   | 39  | 5.2|
| Hematologic and nutritional deficiencies | 25 | 3.3|
| Rheumatological diseases            | 31  | 4.1|
| Other                                | 29  | 3.9|
preferences on hospital application was investigated. Onychophagia/onychotillomania (7) associations were observed between acne and related diseases and deficiencies and spoon nail (10), connective tissue abnormalities and onychophagia/onychotillomania. Literature research has shown that spoon nail is primarily recognized as a manifestation of chronic iron deficiency (10), nail fragility is usually enviromental in origin and trauma is one of the main causes of these enviromental factors (11) and there is a well-known relationship between onychomadesis and autoimmune diseases (12).

We have shown that there were associations between neuropsychiatric diseases and onychophagia/onychotillomania, while older patients were more likely to have onychophagia, onychomycosis and traumatic nail diseases. It is well-known that onychomycosis is common on the great toenail of elderly patients and generally associated with self-neglect, homelessness, dementia, trauma and peripheral circulation disorders (8). Furthermore, onychophagia/onychotillomania, which usually starts during childhood, is a diseases of young adults with comorbidities of anxiety and obsessive compulsive disorders (9). We have shown that there were associations between neuropsychiatric diseases and onychophagia/onychotillomania, acne and related diseases and onychophagia/onychotillomania also neuropsychiatric diseases and onychophagia.

As per our observations, significant relationships were observed between hematologic and nutritional deficiencies and spoon nail, pruritus and pruritic dermatoses and nail fragility, blistering dermatoses and onychomadesis, connective tissue diseases and onychomadesis. Literature research has shown that spoon nail is primarily recognized as a manifestation of chronic iron deficiency (10), nail fragility is usually enviromental in origin and trauma is one of the main causes of these enviromental factors (11) and there is a well-known relationship between onychomadesis and autoimmune diseases (12).

One of the major aims of our study was to investigate patients’ preferences on hospital application. We have shown that admission was related to a nail abnormality/disease only in 8.1% of the patients. However, nail abnormalities/diseases were observed in 28.4% of the subjects. This finding suggests that there is a lack of knowledge about nail diseases in general population. There is a limited literature on the prevalence of nail diseases in patients admitted in the dermatology outpatient clinic. As far as we know, our present study is the first few studies to demonstrate that age and gender were associated with nail abnormalities/diseases. We have demonstrated that age and gender were associated with nail abnormalities/diseases. Our study demonstrated that nail psoriasis and subungual hematomata were observed more frequently in men than in women. Younger patients were more likely to have periangual wart and onychophagia/onychotillomania, while older patients were more likely to have onychophagia, onychomycosis and traumatic nail diseases. It is well-known that onychomycosis is common on the great toenail of elderly patients and generally associated with self-neglect, homelessness, dementia, trauma and peripheral circulation disorders (8). Furthermore, onychophagia/onychotillomania, which usually starts during childhood, is a diseases of young adults with comorbidities of anxiety and obsessive compulsive disorders (9). We have shown that there were associations between neuropsychiatric diseases and onychophagia/onychotillomania, acne and related diseases and onychophagia/onychotillomania also neuropsychiatric diseases and onychophagia.

| Acne and related diseases | 287 | 14.5 |
| Cutaneous infections | 392 | 19.9 |
| Contact dermatitis | 198 | 10 |
| Urticaria and angioedema | 81 | 4.1 |
| Pruritus and pruritic dermatoses | 220 | 11.2 |
| Psoriasis and related diseases | 85 | 4.3 |
| Lichen planus and lichenoid disorders | 22 | 1.1 |
| Other inflammatory dermatoses | 160 | 8.1 |
| Connective tissue diseases | 19 | 1 |
| Blistering dermatoses | 85 | 4.3 |
| Cutaneous lymphomas | 18 | 0.9 |
| Drug reactions | 30 | 1.5 |
| Pigmentary disorders | 49 | 2.5 |
| Hair disorders | 80 | 4.1 |
| Neoplastic changes | 126 | 6.4 |
| Dermatoses resulting from physical factors | 37 | 1.9 |
| Nail diseases | 84 | 4.3 |

Patients with onychomycosis (p < 0.001), traumatic nail diseases (p < 0.006), periangual wart (p < 0.001), onychophagia/onychotillomania (p < 0.001), paronychia (p < 0.014), dystrophic nail (p < 0.001), pseudomonas nail infection (p < 0.001), onychophagia (p = 0.005) and onychomadesis (p < 0.001) were significantly more likely to apply for the nail disease per se.

**DISCUSSION**

According to our study the prevalence of nail abnormalities/diseases was 28.4%. Onychomycosis was the most frequent nail abnormality/disease with a frequency of 27.5%, followed by leukonychia and splinter hemorrhages. In a study with a sample of 15,000 patients, abnormal-appearing nails were observed in 16.7% of the patients and there were 1199 patients (8%) with toenail or fingernail onychomycosis confirmed on mycologic examination (4). In addition, it has been suggested that onychomycosis is the most frequent nail disease and accounts for up to 50% of all nail diseases (5). On the other hand, a literature study had shown that onychomycosis might not be as common as cited in the literature owing to the fact that hospital-based studies most probably overestimate the prevalence of onychomycosis (6). Onychomycosis is known to be more common in male patients and older persons (6). Our study also confirmed these findings, also we have demonstrated that endocrine diseases, which include diabetes mellitus, are significantly associated with onychomycosis.

Leukonychia and splinter hemorrhages were the other frequent nail abnormalities/diseases. In the literature, there is a limited number of studies examining the prevalences of nail abnormalities. Jemec et al. had found the prevalences of leukonychia and splinter hemorrhages as 11.8% and 0.9%, respectively (7). To the best of our knowledge, our present study is the first few studies to investigate not only the prevalences, but also factors associated with the nail abnormalities/diseases. We have demonstrated that age and gender were significantly associated with the prevalence rates of nail abnormalities/diseases. Our study demonstrated that nail psoriasis and subungual hematomata were observed more frequently in men than in women.
3. Sano H, Ogawa R. Clinical Evidence for the Relationship between Nail Configuration and Mechanical Forces. Plast Reconstr Surg Glob Open 2014;2:e115.

4. Gupta AK, Jain HC, Lynde CW, et al. Prevalence and epidemiology of onychomycosis in patients visiting physicians' offices: a multicenter canadian survey of 15,000 patients. J Am Acad Dermatol 2000;43:244-8.

5. Faergemann J, Baran R. Epidemiology, clinical presentation and diagnosis of onychomycosis. Br J Dermatol. 2003 Sep;149 Suppl 65:1-4.

6. Sigurgeirsson B, Baran R. The prevalence of onychomycosis in the global population: a literature study. J Eur Acad Dermatol Venereol 2014;28:1480-91.

7. Jemec GB, Kollerup G, Jensen LB, et al. Nail abnormalities in nondermatologic patients: prevalence and possible role as diagnostic aids. J Am Acad Dermatol 1995;32:977-81.

8. Chang P, Meaux T. Onychogryphosis: A Report of Ten Cases. Skinmed 2015;13:355-9. eCollection 2015.

9. Pacan P, Grzesiak M, Reich A, et al. Onychophagia and onychotillomania: prevalence, clinical picture and comorbidities. Acta Derm Venereol 2014;94:67-71.

10. Kumar V, Aggarwal S, Sharma A, et al. Nailing the diagnosis: koilonychia. Perm J 2012;16:65.

11. Baran R, Schoon D. Nail fragility syndrome and its treatment. J Cosmet Dermatol 2004;3:131-7.

12. Hardin J, Haber RM. Onychomadesis: literature review. Br J Dermatol 2015;172:592-6.