Turkish Journal of Geriatrics
2014; 17 (2) 119-124

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RESEARCH

NAIL CHANGES AND DISEASES IN GERIATRIC AGE GROUP: ASSESSMENT OF 249 PATIENTS ADMITTED TO DERMATOLOGY OUTPATIENT CLINIC

ABSTRACT

Introduction: The increase in the geriatric population requires the maintenance of quality of life at an older age. Although nail diseasesdo not usually affect life expectancy, they are important in terms of quality of life and the morbidity that they may cause.

Materials and Method: For this study, we recruited a total of 249 patients aged 65 years and older who had presented to the dermatology outpatient clinic. The incidence of nail diseases, the age groups for these diseases, education levels, BMIs and the relationship with additional diseases were investigated.

Results: The most frequent nail color change was lunula loss, in 77.9% of participants, and the most frequent surface change was brittle nails, in 42.1%.The most common nail finding due to repetitive trauma was splinter hemorrhages, in 16.9%, followed by onychauxis in 8.4% and onychocryptosis in 7.6%. The most common contour change was pincer nail,in 5.6%, and the most common infection was onychomycosis,in 33.3%. Lunula loss and onychauxis were significantly more common in patients aged 75 or older, compared to younger patients (p=0.002, p=0.01, respectively). BMI was significantly higher in patients diagnosed with an ingrowing nail (p <0.001).

Conclusion: The most frequently observed color change in the geriatric age group is lunula loss; the most common surface change is brittle nail, and the most common nail infection is onychomycosis. Lunula loss and onychauxis development increase with age. It is quite important to know the common nail diseases in order to be able to detect age-specific nail changes and the clues they provide in the geriatric age group.

Key Words: Aged; Patient; Nail.

ARAŞTIRMA

GERİATRİ YAŞ GRUBUNDA TIRNAK DEĞİŞİKLİKLERİ VE HASTALIKLARI: DERMATOLOJİ POLİKLİNİĞİNE BAŞVURAN 249 HASTANIN DEĞERLENDİRİLMESİ

ÖZ

Giriş: Geriatik nüfusun artması, ileri yaşta nitelikli yaşam sürme gereksinimi beraberinde getirmektedir. Tırnak hastalıkları yaşam süresini etkilemiyor gibi görünse de, yaşam kalitesi açısından ve yol açabileceği morbiditeler açısından önemli yer tutmaktadır.

Gereç ve Yöntem: Araştırmaya dermatoloji polikliniğine başvuran 65 yaş ve üzeri 249 hasta dahil edildi. Hastalarda saptanan tırnak değişiklikleri ve lezyonlarının görülme sıklığı ile birlikte yaş grupları, öğrenim durumu, Beden kitle indeksi ve ek hastalıklar ile ilişkisi araştırıldı.

Bulgular: Hastalarda saptanan en sık renk değişikliği %77,9 ile lunula kaybı ve en sık yüzey (surface) değişikliği %42,1 ile kırılgan tırnak olarak tespit edildi. Tekrarlayan travmalara bağlı tırnak değişikliklerinde en sık rastlanan bulgular sırasıyla %16,9 ile splinter hemoraji, %8,4 ile onychauxis ve %7,6 ile onychocryptosis olarak gözlendi. En sık rastlanan kontur değişikliği %5,6 ile pincer nail iken en sık rastalanan enfeksiyon hastalığı da %33,3 ile onikomikoz idi. Yaş grupları ile korelasyona bakıldığında, 75 yaş ve üzeri hastalarda lunula kaybı ve onychauxis, 75 yaş altı hastalara göre anlamlı olarak yüksek saptandı (sırası ile p=0,002, p=0,01). Hastalıkların BMİ ile korelasyonu değerlendirildiğinde, tırnak batması saptanan hastalarda BMİ'in anlamlı olarak yüksek olduğu tespit edildi (p <0,001).

Sonuç: Geriatrik yaş grubunda en sık gözlenen renk değişkliği lunula kaybı, en sık rastlanan yüzey değişikliği kırılgan tırnak, en sık rastlanan enfeksiyon hastalığı onikomikozdur. Lunula kaybı ve onychauxis gelişimi yaş ile korele olarak artar. Tırnak hastalıklarının geriatrik yaş grubu hastalarındaki yaşa özel değişkiliklerini ve bize gösterdiği ipuçlarını görebilmek açısından sık gözlenen tırnak hastalıklarını bilmek oldukça önemlidir.

Anahtar Sözcükler: Yaşlı; Hasta; Tırnak.

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Geliş Tarihi: 20/01/2014
(Received)

Kabul Tarihi: 19/02/2014
(Accepted)

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Introduction

The increase in the elderly population throughoutthe world and in our country requires the maintenance of quality of life at an advanced age. Although nail diseases do not usually affect life expectancy, they are important in terms of quality of life and the morbidity that they may cause. There are changes in nail color, thickness, shape, structure and surface with the degradation of nutrition in the nail bed and germinative matrix, as a natural result of aging. Factors such as joint restriction, visual problems, increased trauma and low motivation for personal care with advancing age may also contribute to the progression of problems by creating nail care difficulties (1-3).

A dermatology examination is not complete without a thorough nail examination. The changes in an elderly patient may be a natural process of aging, or may be modified by age although present for a long time. Some nail appearances may be a clue to systemic diseases or may lead to susceptibility to some conditions that may lead to much more serious problems in the future. Protection from nail diseases requires periodic nail care and an appropriate medical approach (1,4). It is therefore important to know the natural process and common diseases and approaches in geriatric patients.

In this study, we aimed to determine the prevalence of nail changes and diseases in patients aged 65 years or more, the distribution of these diseases by age group, and their correlation with additional diseases, body mass index and educational levels.

Materials and Method

For this study, we recruited a total of 249 patients aged 65 years or older who presented to the Ankara Ataturk Training and Researh Hospital dermatology outpatient clinic. The approval of the local ethics committee of our hospital was obtained before starting the study, and the study was conducted in accordance with the Helsinki Declaration. All patients participating in the study were informed about the study and signed an informed consent form. Demographic information and body mass index (BMI) of the patients were recorded. A dermatological examination including a detailed nail evaluation was performed by dermatologists. A native preparation was prepared for microscopy in patients who were suspected of suffering from onychomycosis. A biopsy was taken and a histopathological examination performed when necessary. The patients were divided into 2 age groups as 65-74, 75 years and over. The incidence of nail diseases, the age groups of these diseases, BMI and their relationship were investigated.

Table 1— Demographic and Clinical Characteristics of Patients.

Sex, n (%)	
Male	118 (47.4)
Female	131 (52.6)
Age.	
Min-max. (mean±sd)	65-97 (70.19±6.56)
65-75	206 (82.7)
75-85	33 (13.3)
>85	10 (4.0)
BMI	
≤30	147 (63.6)
>30	84 (36.4)
Nail disease duration (mean±sd)	1-560 (62.5±22.1)

Statistical analyses were performed using SPSS 16.0 (Chicago, IL, USA). Of the continuous variables, those with normal distributions were describedwith mean ± sd, while those that were not consistent with a normal distribution were described with medians, and categorical variables were described as numbers and percentages. Comparisons were made using Mann-Whitney U tests for continuous variables and chi-square tests for categorical variables. A p value <0.05 was accepted as significant.

Results

A total of 131 (52.6%) females and 118 (47.4%) males participated in the study. The age range was 65 to 97 years and the mean age was 70.19±6.56 years. Patients'clinical and demographic data are summarized in Table 1. The most frequent nail color changes were lunula loss at 77.9% and dull nail at 41.7%. The most frequent surface change was brittle nails at 42.1%. The most frequent brittle nails group included onychorrhexis (38.6%) (Figure 1) and onychoschizia

Figure 1— Onychorrhexis on the toenail and superficial white onychomycosis on the second nail of 67-year-old male patient.

Figure 2— Onychoschizia and subungual hematoma on the big toenail of a 71-year-old male patient.

Figure 3— Onychogryphosis on the 1st, 2nd and 3rd toenails of a 75-year-old female patient.

Table 2— Skin Findings in the Geriatric Age Group and the Distribution of Disorders by Age Group.

	Total n=249	**65-74 n=206**	**≥75 n=43**
	n (%)	n (%)	n (%)
Alteration in nail color			
Lunula loss	194 (77.9)	163 (79.1)	31 (72.0)
Dull, pale discoloration	104 (41.7)	78 (37.8)	26 (60.5)
Leukonychia	12 (4.8)	11 (5.2)	1 (3.0)
Melanonychia	2 (0.8)	1 (0.5)	1 (3.0)
Alteration in nail surface texture			
Brittle nails	105 (42.1)	72 (34.95)	33 (76.7)
Onychorrhexis	96 (38.6)	75 (36.4)	21 (48.8)
Onychoschizia	60 (24.1)	50 (24.3)	10 (2.3)
Transverse splitting	23 (9.2)	21 (10.2)	2(4.6)
Triangular fragments at the free edge	20 (8.0)	17 (8.3)	2 (4.6)
Lamellar splitting	16 (6.4)	15 (7.3)	1 (2.3)
Pitting	7 (2.8)	5 (2.4)	2 (4.6)
Linked to repeated trauma			
Splinter hemorrhages	42 (16.9)	34 (16.5)	8 (18.6)
Onychauxis	21 (8.4)	15 (6.6)	6(13.9)
Onychocryptosis	19 (7.6)	19 (9.2)	- (-)
Pachyonychia	18 (7.2)	11 (5.3)	7 (16.2)
Subungual hematomas	11 (4.4)	9 (4.3)	2 (4.6)
Median nail dystrophy	8 (3.2)	7 (3.4)	1 (2.3)
Onycholysis	6 (2.4)	5 (2.4)	1(2.3)
Onychogryphosis	5 (2.0)	4 (1.9)	1 (2.3)
Onychoclavus	2 (0.8)	1 (0.5)	1 (2.3)
Nail biting	1 (0.4)	1 (0.5)	- (-)
Alteration in contour			
Pincer nail	14 (5.6)	13 (6.3)	1 (2.3)
Koilonychia	3 (1.2)	2 (0.9)	1(2.3)
Infections			
Onychomycosis	83 (33.3)	57 (27.66)	23 (53.5)
Paronychia	2 (0.8)	2 (0.9)	- (-)
Tumors			
Amelanotic malignant melanoma	1 (0.4)	- (-)	1 (2.3)
Myxoidpseudocyst	1 (0.4)	1 (0.5)	- (-)
Subungual exocytosis	1 (0.4)	1 (0.5)	- (-)

(24.1%) (Figure 2). Onychogryphosis was present in 2% of our patients (Figure 3). Skin findings and the distribution of the disorders by age group are summarized in Table 2. Among our patients with onychomycosis, 63.4% had distal lateral subungual onychomycosis (DLSO) , 12.9% had total dystrophic onychomycosis (TDO), and 7.5% had superficial white onychomycosis (SWO) (Figure 1). We did not find any patients with proximal subungual onychomycosis in our study. A myxoid pseudocyst was present in one patient. Regarding age groups, lunula loss and onychauxis weresignificantly more common in patients aged 75 years or over compared to younger patients (p=0.002, p=0.01, respectively). BMI was significantly higher in patients with an ingrowing toenail (p <0.001).

Discussion

Nail region problems in the elderly, who are gradually constituting a larger part of society, make up 10% of all dermatological disorders (2). Some nail changes are due to the natural aging process. Nail water and calcium concentrations decrease with aging, while magnesium increases and iron decreases. The size of the nail plate keratinocytes increases. The elastic tissue and blood vessels thicken with aging, causing the nail bed dermis and especially the section under the pink portion of the nail to thicken. Atherosclerosis also causes changes in the nails (1,5).

The nail plate color may show various changes with advancing age. Normally, the lunula area is white and the nail bed is pink. Lunula loss, in 77.9% of our patients, was the most frequent nail color change. The decrease in lunula visibility is considered a natural age-related change when detected at advanced ages (6). The significantly higher lunula loss rate in patients aged 75 and over in our study supports the correlation with age.The second most frequent color change in our patients was a pale and dull nail appearance. Rao et al. reported this finding at a rate of 69%, lower than in our patients, in astudy they conducted with 100 patients over the age of 60. The rate of leukonychia was 4.7% in our study. It can be in the form of real leukonychia, where the matrix is also included, or as total, subtotal, transverse, punctate or longitudinal leukonychia. Leukonychia is thought to be due to repetitive microtrauma and may also be due to cirrhosis, azotemia and hypoalbuminemia, oroccur without other disorders. Pseudoleuconychia can be present in onychomycosis and after enamel procedures, along with keratin granulation (2). The change is called ''Neapolitan nail" as it resembles Neapolitan ice cream and is characterized by the lack of the lunula and a color change that is white in the proximal nail plate, pink in the middle part and opaque in the distal section to make up 3 horizontal bands. Although a study has reportedthat a special color change is present in about 20% of people older than 70, we did not detect this in our study (7). Terry nail, another disorder considered to be the natural result of aging, is characterized by a white band at the proximal nail and a pink band at the distal section and was not found among our patients (8,9). Longitudinal melanonychia was present in 0.8% of our patients. It has been described as "frictional longitudinal melanonychia" due to repetitive trauma (1,10). The main disorders in the differential diagnosis of longitudinal melanonychia are nevi and fungal infections and distinguishing itfrommalignant melanoma is very important. Hutchinson's finding is pigmentation of the nail bed and around the matrix and indicates melanoma. When melanonychia is found in older patients, a careful history should be taken, samples for fungal infection should be taken, dermatoscopical examination should be performed and a biopsy should be obtained if necessary (11,12).

The normal nail surface is smooth and various irregularities can develop in the nail surface with advancing age. The fingernails are normally soft and fragile and are prone to longitudinal fissuring and splitting. Contrary to popular belief, the calcium content in the nail bed is as low as about 0.2%, and does not contribute to the hardness of the nail. (3,13-15). An age-dependent decrease in cholesterol sulphate levels is thought to contribute to these brittle nails (1). The most common surface change in our patients was brittle nails, at a rate of 42.1%. This ratio is higher than the ratio of 34% reported by Rao et al. (5). Brittle nails can appear as onychorrhexis, onychoschizia, lamellar and transverse splitting, and triangular fragments at the free edge. Onychorrhexis is longitudinal ridging in the nail surface. Aging is the most important reason for onychorrhexis (16). The onychorrhexis rate was 24.1% in our study and was reported as 85% by Rao et al. Onychorrhexis can be defined as transverse and lamellar splitting of the distal nail plate and free edge. Avoiding repeated wetting and drying, hydration of the nail with phospholipid-rich emollients, and the use of nail hardeners containing formaldehyde and biotin at 2.5 mg/day for 1.5-15 months are recommended for brittle nail treatment (2,3). The nail surface disorder of pitting was present in 2.8% of our patients. The most common reason is psoriasis, but it can also be found in alopecia areata and finger eczema (1,4).

In our study, the most common disorder due to repetitive trauma was splinter hemorrhage. Nail bed capillaries in people over the age of 70 often show distortion. These capillary distortions are thought to be responsible for the splinter he-

morrhages seen in the elderly (1). The most common cause in elderly patients is trauma (2).

Onychauxis was significantly more common in patients over the age of 75 in our study. Pachyonychia is hypertrophy of the whole nail plate, while onychauxis is local hypertrophy of the nail plate (17). Loss of transparency of the nail plate is characterized by color change and subungual hyperkeratosis. It may be idiopathic or age-related and is more commonly observed in the toes. The risk of onychomycosis is increased in these nails (1). The increased rate in our patients over the age of 75 supports the effect of advanced age and increasing trauma.

Onychocryptosis is an ingrowing or embedded toenail. Ingrowing toenails were found in 7.6% of our patients and were significantly more common in obese patients. Obesity is considered to contribute to a predisposition for onychocryptosis (18). Cutting the nails incorrectly due to limitation of movement and visual problems in the elderly contributes to this susceptibility Granulation tissue formation or secondary infection may be seen. Conservative treatment, regular nail care, proper footwear, and fighting infection in the elderly are important in prevention and treatment (1,2,18).

The rate of subungual hematoma in the elderly was 4% in our study. Rao et al. found subungual hematoma in three patients (5). The cause can be trauma, improper footwear, or walking long distances. Anticoagulant use also increases the likelihood of developing a hematoma. A color change progressing to the distal section and a gradually lighter color are important clues in distinguishing hematomas from nevi and melanomas. Evacuating the hematoma when it is first formed decreases the pain (1,2,4).

Onychogryphosis is also called oyster shell or ram's horn deformity. It was found in 5% of our patients and it develops as a result of hyperkeratotic tissue formation in the lateral nail folds or periungual folds due to onycholysis or the repeated minor trauma of improper footwear. Cutting the nail is very difficult because it is thickened. Periodic debridement of the thickened nail plate is therefore required. Electrical files and creams containing 40% or more urea can be useful. Chemical or surgical matricectomy should be used in recurrent and complicated cases (2).

Pincer nail was the most common contour change in our study and can affect only the big toenail or all toe nails. If mild, the inward turning of the nail can be prevented and nail plate pressure decreased by fixing the nail from the top with stainless steel wire and plastic supports for 6 months. The removal of the lateral matrix with phenol is the simplest, least painful and most effective treatment (1,19).

Other nail contour changes we observed were clubbing and spoon nail (koilonychia).Clubbing is a hyponychial angle (the angle between the skin and nail) over 180 degrees with softening in the nail bed and increased nail curvature. It may be observed together with lung neoplasms and infections, subacute bacterial endocarditis and cyanotic congenital heart diseases and hepatocarcinoma. Spoon nail may be associated with iron deficiency anemia, polycythemia, coronary diseases, and endocrine disorders such as diabetes and acromegaly (1).

The most common nail infection was onychomycosis, at 33.3% in our study. This rate was consistent with the 31.5% reported by Yalcin et al., who investigated skin diseases in 4099 geriatric patients, and lower than the 41.5% reported in a prospective analysis of skin diseases in 200 geriatric patients conducted in 2010 (20,21). Incidence of the subtypes of onychomycosis we found in our study is consistent with astudy of 108 patientsby Dias et al., where foot onychomycosis was investigated in the geriatric population. The DLSO, TDO and SWO rates were 63.4%, 12.9% and 7.5%, respectively, in our study and 59.3%, 24.1% and 4.6% in the Dias et al. study. Aging increases susceptibility to onychomycosis (22). The nails become discolored, brittle and thickened. (1,22). Exposure of the nails to microtrauma, improper shoes, and the spread of dermal fungal infection to the nails responsible in the etiology (23). The basic complaint is usually aesthetic, but tenderness can also be present and the thickened nails can lead to onychomycosis. Treatments used in young patients can also be provided to healthy elderly subjects. If systemic treatment is needed, other medications taken by the patient should be queried for drug interactions. 250 mg/day terbinafine or 100 mg/day itraconazole can be used for 6 weeks for fingernails and 12 weeks for toenails. Mechanical interventions, local treatments such asantifungal nail polishes, and chemical nail thinning using preparations with urea when there is no risk of ischemia are more suitable when oral treatment cannot be administered (1).

Paronychia is characterized by inflammation of the softnail tissue at the proximal part and lateral edge. We found this disorder at a rate 0.8% in our study. Acute paronychia is common in the elderly and causes secondary changes in the nail plate The disorder can be treated with abscess drainage, topical or systemic antibiotics. Chronic paronychia is characterized by nail plate changes in the form of erythematous and swollen nail folds, cuticle loss, and a large number of transverse ridges. Keeping the nail folds dry, and topical antifungal or antiseptic agents, are used in the treatment (2).

Mucous cyst, also known as myxoid pseudocyst, is the most common benign nail tumor. Mucous cysts are more

common in women and are most commonly found at the proximal nail fold of the fingers. (4).

The nail cancer incidence peaks in the 7th decade (2). Amelanotic malignant melanoma wast he only malignant tumor we found in our study. Amelanotic malignant melanoma is most commonly confused with pyogenic granuloma. Pyogenic granuloma and amelanotic malignant melanoma should be considered in hemorrhagic tumors that grow rapidly in geriatric patients and a biopsy should be obtained before starting treatment (24).

In conclusion, the most frequently observed color change was lunula loss, the most commonly found surface change was brittle nails, and the most commonly found infectious disease was onychomycosis in the geriatric age group. Knowing the common nail changes and diseases, the changes that should be considered normal, and the clues that can indicate dangerous disorders in the geriatric age group is very important in taking preventive measures and planning treatment.

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