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Original Research Article

A COMPARATIVE STUDY OF NAIL CHANGES AND NAIL DISORDERS IN ELDERLY AND OLDER

Sudhir Kumar Gupta[1], U. K. Udayan[2]

[1]Senior Resident, Department of Dermatology Veneriology and Leprosy, Darbhanga Medical College Hospital Laheriasarai Darbhanga, Bihar, India
[2]Associate Professor, Department of Dermatology Veneriology and Leprosy, Darbhanga Medical College Hospital Laheriasarai Darbhanga, Bihar, India.

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Corresponding Author:
Dr. Sudhir Kumar Gupta,
Email: skg595959@gmail.com

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Abstract

Background: The aim of present work is to assess the nail changes and disorders in people above 50 years old compared with control age group (20 – 30 Years old. **Materials and Methods:** The study included 300 subjects, of them 150 persons were above 50 years old (study group), the other 150 subjects were from 20 - 30 years old (control group). The study was performed in the outpatient of Dermatology, Venereology and Leprosy Department at Darbhanga Medical College and Hospital, Laheriasarai, Bihar in the period from January 2024 to December 2024, those patients came from different sites inside and outside Darbhanga. The design of study is case control, cross-sectional study of analytic purpose. A careful clinical examination of the nails was carried out including the type of nail change, site and symmetry. A magnifying lens of 4× power was used. **Result:** The most common occupations for study group were house wife's 45%, agriculture 25%, hard laborer 15%, office work 13% and other types of work 7%. Environmental exposure of any precipitating factor like trauma, sport activities or even attaining abnormal posture, abnormal habits, tight shoes, use of cosmetics, any emotional upset or stressful conditions was related to many of the changes observed, in both study and control groups. **Conclusion:** Some changes of the nail were significantly correlated with advanced age like dull opaque nails, rough lusterlessness and longitudinal ridging. Finger nail growth may be considered as a sign of aging of healthy people.

INTRODUCTION

Though nail disorders can affect any age, some of the diseases have a predilection for the aged. Pre-existing disorders may also be modified by progressive ageing. First and fifth digits are most commonly involved, with other digits being affected with varying frequency.[1] Nail disorders comprise approximately 10% of all dermatologic conditions, the prevalence being higher in the elderly.[2] The senile changes are presumably due to impaired peripheral circulation. Frequently arteriosclerosis is the cause, though it may not be marked. Trauma, faulty biomechanics, infections, concurrent dermatological or systemic diseases and their treatments are also contributory factors.[3]

Changes which are observed in human nails as part of ageing process include:

1. Alteration in chemical composition, the calcium content of the nails increases whereas iron decreases.
2. Alteration in histology, the nail plate keratinocytes enlarge. There is an increase in the number of "pertinax bodies". The nail bed dermis shows thickening of the blood vessels and degeneration of the elastic tissue, especially beneath the pink part of the nail.
3. Alteration in nail growth, in the elderly, the rate of nail growth decreases progressively between 25 to 100 years of age, by approximately 0.5% per year.
4. Alteration in color, the senile nails may appear pale, dull, opaque, with the color ranging from yellow to brown or gray. Lunula may be decreased or absent altogether.
5. Alteration in contour, the senile nails usually has an increased transverse curvature and a decreased longitudinal curvature. Flattening of the nail plate (platyonychia), spooning (koilonychia), pincer nail deformity (involution) is found more frequently.
6. Alteration in surface texture, the senile nail may have increased longitudinal striations due to altered turnover rate of the matrix cells. Alteration in thickness and consistency, in the elderly, the nail plate thickness may increase, decrease or may remain unchanged.

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Nail Disorders among Elderlies:

Common nail disorders that may affect elderly people more frequently than younger age individuals include Brittle nails which are common in persons older than 60 years and about 20% of randomly selected population is affected in one study.[4] Females were affected more in a ratio of 2:1. They manifest as excessive longitudinal ridges, roughness of the nail plate (trachyonychia), horizontal lamellar splitting of distal nail plate (onychoschizia or onychoschisis), and irregularity of the distal edge of the nail plate.[5] Onychodystrophies such as nail plate hypertrophy (onychauxis), onychogryphosis, onycholysis, ingrowintoe nails (onychocryptosis), ony-chophosis, subungual hyperkeratosis, subungual corn (onychoclavus) and subungual hematoma, which these disorders usually result from Bony deformities of the digits or foot-to -shoe incompatibility (ill fitting shoes), can cause faulty biomechanics leading to onychodystrophies. Other disorders like Onychomycosis, Paronychia, Subungual Exostosis, Myxoid Pseudocysts, Subungual Melanoma, also reported to occur more frequently in elderly people.[6] Many previous studies have been done to assess the nail changes and disorders in elderly people who have various dermatological and systemic diseases, so, in this study we tried to more precisely specify those changes related to age from other changes that were due to associated conditions and treatments with advanced age.[7] The aim of present work is to assess the nail changes and disorders in people above 50 years old compared with control age group (20 – 30 Years old).

MATERIALS AND METHODS

The study included 300 subjects, of them 150 persons were above 50 years old (study group), the other 150 subjects were from 20 - 30 years old (control group). The study was performed in the outpatient of Dermatology, Venereology and Leprosy Department at Darbhanga Medical College and Hospital, Laheriasarai, Bihar in the period from January 2024 to December 2024, those patients came from different sites inside and outside Darbhanga. The design of study is case control, cross-sectional study of analytic purpose.

A detailed history from each subject was recorded, using questionnaire, to detect the onset, duration and progression of nail changes and/or disorders and their occupation. Environmental exposure of any precipitating factor like trauma, sport activities or even attaining abnormal posture, abnormal habits, tight shoes, use of cosmetics, any emotional upset or stressful conditions was also assessed. A careful clinical examination of the nails was carried out including the type of nail change, site and symmetry. A magnifying lens of 4× power was used. The rate of growth of the left thumb nail per day was measured by observing the distal movement of a trans-verse scratch made on nail Plate over a fixed period of time (monthly for 6 months), using a rule and magnifying lens.

Inclusion criteria:

Subjects above 50 years old of age (study group) and subjects from 20 - 30 years old (control group), of both sexes were included in the study.

Exclusion criteria:

1. Systemic diseases: chronic hepatic disease, chronic renal disease, etc.
2. Dermatological diseases: psoriasis, lichen planus, alopecia areata, eczema, genodermatosis or other congenital nail diseases.
3. Drugs: Chemotherapy, B- blockers, PUVA, Retinoids, Others.

RESULTS

The study included 300 subjects. One hundred fifty as study group (75 males, 75 females) were above 50 years (mean± SD 68.4 ± 8.9). While 150 subjects were taken as control group (75 males, 75 females), their ages ranged 20 - 30 years (mean ± SD 23.02 ± 1.9), [Table 1].

Figure 1: longitudinal ridging and dull opaque nails

Figure 2: Dark dull opaque nails

The most common occupations for study group were house wife's 45%, agriculture 25%, hard laborer 15%, office work 13% and other types of work 7%. Environmental exposure of any precipitating factor like trauma, sport activities or even attaining

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abnormal posture, abnormal habits, tight shoes, use of cosmetics, any emotional upset or stressful conditions was related to many of the changes observed, in both study and control groups. The frequency of nail changes among the study group and controlGroup is shown in [Table 2].

Figure 3: Onychotillomania showing ragged cuticle and bleeding

Figure 4: Pale white dull opaque nails

Figure 5: Median nail dystrophy

The following nail changes were more frequent among study group than control group with significant statistical difference (p = 0.044 - 0.000) like dull opaque, rough lusterlessness, longitudinal ridging, altered thickness, ragged cuticle, altered contour, subungual hyperkeratosis and scaling nail folds. Longitudinal ridging (onychorrhexis), showed increased frequency (73% of the study group versus 0% of the control) with p = 0.000. The different types and distributions of altered contour in study group are including platyonychia, koilonychia, increased transverse curvature, pincer nail, dystrophy and downward bent distal nail plate. The different types and distributions of altered thickness of nail plate in the study group are thickening, thinning and onychogryphosis. Other changes although were statistically not significant, some of them occurred more frequently among the study group like pitting, onycholysis, Paronychia; on the contrary, in growing nails were reported more frequently in the control group. Chromonychia was not statistically significant (16% of study group versus 18% of the control) with p = 0.693. Longitudinal melanonychia.

Figure 6: Punctuate leukonychia

Figure 7: Pincer nails and periungual inflammation

Was significantly higher in the study group (8% versus 0% of the control) with p = 0.014, while punctuate leukonychia was significantly higher in the control group (18% versus 6% of study group) with p =0.005. In each subject the rate of growth of the left thumb nail per day was measured. The mean rate of nail growth of males and females in study group were 0.088 mm/day and 0.078 mm/day respectively, and for the control group were 0.086 mm/day and 0.083 mm/day respectively. So, the rate of nail growth was higher in control group than in study group for both sexes.

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Table 1: Age, sex and disease duration among the study group and Control group.

No.	Study group 150 (75 males, 75 females)		Control (20-30 years) 150 (75 males, 75 females)	Total 300
Age (yrs)	Range Mean ±SD	51-94 68.4 8.9	20-30 23.02 1.9	
Duration ofdisease (weeks)	Range Median Mean ±SD	1-1081 431 538 ±65.4	1-159 79 95 ±29.8	

Table 2: Spectrum of nail changes in study group and control group (20-30 years)

Nail Changes	No. of subjects				Chi-square	P-Value
	Study group		Control group			
	Male No.&%	Female No.&%	Male No.&%	Female No.&%	145.8	0
Dull opaque	44(88%)	43(68%)	0	0	115.8	0
Rough lusterless	45(90%)	41(82%)	0	0	108.6	0
Longitudinal ridging	44(88%)	29(58%)	0	0	36.2	0
Altered thickness	15(30%)	17(34%)	0	0	30.0	0
Ragged cuticle	19(38%)	13(26%)	3(6%)	0	27.5	0
Altered contour	9(18%)	21(42%)	0	3(6%)	23.2	0
Subungual hyperkeratosis	13(26%)	10(20%)	0	0	13.7	0
Scaling nail folds	5(10%)	9(18%)	0	0	9.3	0.005
Onychoschizia	5(10%)	5(10%)	0	0	9.3	0.005
Brittle nails	5(10%)	5(10%)	0	0	7.1	0.014
Onychomycosis	0	0	0	0	5.0	0.044
Shiny nails	5(10%)	0	45(90%)	25(50%)	96.7	0.00
Normal nails	3(6%)	0	0	4(8%)	4.7	0.52
Pitting	7(14%)	3(6%)	0	4(85)	4.7	0.52
Onycholysis	5(10%)	5(10%)	4(8%)	0	0.787	0.156
Splinter hemorrhage	5(10%)	0	0	6(12%)	0	0.156
Beau's lines	2(4%)	3(6%)	9(18%)	9(18%)	0.257	0.156
Chromonychia	6(12%)	9(18%)	3(6%)	0	0.787	0.156
Subungual hematoma	4(8%)	0	0	0	3.02	0.156
Paronychia	0	4(8%)	0	0	3.02	0.156
Trachyonychia	0	3(6%)	0	0	3.02	0.156
Longitudinal splitting	2(4%)	0	0	0	3.02	0.156
Others Congenital misalignments big toenail	0	2(4%)	0	0	3.02	0.156
Glomus tumor	1(2%)	0	0	0	3.02	0.156
In growing nail	0	3(6%)	0	5(10%)	3.02	0.156
					0.767	0.507

DISCUSSION

Three hundred subjects were included in the study, one hundred fifty as study group; their ages were above 50 years, the other hundred fifty as control group aged 20 - 30 years. In the present study, the first and fifth digits were more frequently involved, and toenail involvement was commoner than the fingernails in many of the changes, which is consistent with the literature. Age related color change of the nail plate like dull opaque nails, was the commonest nail change, being ob-served in (87% of the study group versus 0% of the control) with p = 0.000. This is consistent with the literature showing that senile nail may appear pale, dull and opaque, with its color varying from white or yellow to brown to gray.[8] It is found that white dull opaque nails were more frequent in fingernails, while dark dull opaque nails were more frequent inToe nails, as reported by another study. Rough, lusterless nails were reported to occur mostly in the toes.[9] This study observed this senile nail change in 86% of the study group versus 0% of the control, with p = 0.000, exclusively involving toenails, sparing the great toenail in majority of cases. The present study has demonstrated that longitudinal ridging (onychorrhexis) is strongly associated with aging. The study group showed increase in frequency (73% versus 0% of the control) with p = 0.000. Aging is the commonest cause of onychorrhexis or longitudinal ridging. In this study it is found that both right and left thumbs were equally affected, but the left hand was generally more frequently and more significantly affected than the dominant hand especially the 4th and 5thfingers.[10] This finding has not been reported by previous studies. The frequency was more in fingernails than in toenails. Altered thickness of nail plate was a manifestation of aging as reported by other studies. Similarly this study found a positive correlation between aging and this nail change (32% of the study group versus 0% of the control) with p = 0.000. It was more common in toenails. Thickening was more prevalent in first and fifth toenails of each foot.[11] Altered contour of nail plate is also significantly correlated with increased age (30% of the study group versus

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4% of the control) with p = 0.000. This is also reported as an important senile nail change in literature.[12] Altered contour of nail plate in the form of platyonychia in 3 case, koilonychias in 3 cases, increased transverse curvature in 13 cases, pincer nail 4 cases, dystrophy 16 cases and downward bent distal nail plate 4 cases. Toe-nails were more frequently involved. The prevalence of Onychomycos is increases with age and reaches nearly 22% in patients above 60 years of age. In our study, we found the prevalence of Onychomycosis to be (7% study group vs 0% control) p=0.013 which is significant. Onychomycosis has been reported to be more common in elderly men than elderly women.[13] In our study we found that Onychomycosis exclusively affected women. Although chromonychia is reported as a senile nail change in literature, however, this study did not show a significant correlation with age (16% of the study group versus 18% of the control) with p = 0.693, while longitudinal melanonychia was significantly higher in the study group (8% versus 0% of the control) with p = 0.013, and punctuate leukonychia was significantly higher in control group (18% versus 6% of the study group) with p = 0.005. The higher prevalence of punctuate leukonychia in fingernails among younger age group is also reported earlier being possibly due to micro trauma.[14] The rate of nail growth was higher in control group than in study group for both sexes, this is consistent with previous studies, which showed progressive slowing of nail growth rate with advanced age.[15] Some Limitation of this study, may be, a larger number of subjects and a multicentre study may be required to more precisely assess the nail changes and disorders in older people.

CONCLUSION

Some changes of the nail were significantly correlated with advanced age like dull opaque nails, rough lus-terlessness and longitudinal ridging. Therefore, these signs can be regarded as indicative of ageing in healthy people. Other disorders of the nail like pitting, onycholysis and Paronychia were not age specific and, therefore, cannot be regarded as signs of ageing. Some other nail changes like ingrown nails and punctuate leukonychia were more frequently reported in younger age individuals and hence, they were not ageing signs. Finger nail growth may be considered as a sign of aging of healthy people.

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