Turkish Journal of Geriatrics
2016;19 (4):211-216

Ahu YORULMAZ
Başak YALÇIN

RESEARCH

INVESTIGATING THE FREQUENCY OF DERMATOLOGICAL DISEASES IN THE OLDEST OLD

ABSTRACT

Introduction: As life expectancy increases worldwide, the global incidence of age-related diseases is likely to grow. Although cancer, cardiovascular diseases and neurological diseases are regarded as major age-related diseases, dermatological disorders have also been linked to significant morbidity in geriatric patients. This retrospective study aimed to investigate the frequency of dermatological diseases in patients aged ≥85 years, the so-called "oldest old".

Materials and Method: Descriptive statistics were computed for means, standard deviations and frequencies. The chi-square test or Fisher's exact test was used for statistical analysis, with a significance threshold of $p<0.05$.

Results: A total of 1255 consecutive patients [males, 623; females, 632; mean age, 87.65±2.97 years (range, 85–113 years)] were retrospectively enrolled in the study. Pruritus/pruritic dermatoses was the most frequently recorded dermatological disease group (26.8%, n=383), and xerosis/asteatotic dermatitis was the most frequent disease (14.5%, n=208). There was no statistically significant relationship between age and type of dermatological disease. There was also no statistically significant relationship between sex and type of dermatological disease, except for dermatoses resulting from physical factors, which were found to occur more frequently in males (61.1% vs. 38.9%, $p=0.034$).

Conclusion: The world is ageing and several age-related diseases are on the rise. Not only ageing populations but also healthcare professionals have to face new challenges of longevity. Further studies such as the present investigation are required to determine the epidemiology of dermatological diseases in the elderly and the oldest old.

Key Words: Frail Elderly; Skin Diseases/Epidemiology; Skin Diseases, Bacterial/Epidemiology; Skin Diseases, Viral/Epidemiology.

ARAŞTIRMA

İLERİ YAŞLILARDA DERMATOLOJİK HASTALIKLARIN SIKLIĞININ ARAŞTIRILMASI

ÖZ

Giriş: Küresel düzeyde yaşam beklentisi arttıkça, yaşla ilişkili hastalıkların insidansı da artmaktadır. Her ne kadar malignansi, kardiyovasküler ve nörolojik hastalıklar yaşla ilişkili temel hastalıklar olarak görülse de, dermatolojik hastalıklar da geriatrik olgularda ciddi morbidite nedeni olabilir. Bu retrospektif çalışma 'ileri yaşlı' olarak da adlandırılan 85 yaş ve üzeri olgularda dermatolojik hastalıkların sıklığını ortaya koymayı hedeflemiştir.

Gereç ve Yöntem: Çalışmada ortalama, standart sapma ve frekans değerleri için betimsel analiz yapıldı. İstatiksel karşılaştırmalarda ki-kare veya Fisher kesin ki-kare test kullanıldı. $p<0.05$ olan değerler istatistiksel olarak anlamlı kabul edildi.

Bulgular: Bu çalışmada 1255 ardışık hasta [623 erkek, 632 kadın; ortalama yaş, 87.65±2.97 yıl (dağılım=85-113 yıl)] retrospektif olarak değerlendirildi. Pruritus/pruritik dermatozlar en sık saptanan hastalık grubu iken (%26.8, n=383), kserozis/ asteatotik dermatit en sık tespit edilen hastalıktı (14.5%, n=208). Yaş ile tespit edilen hastalık grupları arasında istatiksel bakımdan anlamlı bir ilişki yoktu. Ayrıca, erkeklerde daha sık saptanan (erkek, %61.1; kadın %38.9; $p=0.034$) fiziksel nedenlerle oluşan dermatozlar dışında, cinsiyet ile ilişkisi istatiksel bakımdan anlamlı olan herhangi bir hastalık grubu da yoktu.

Sonuç: Dünya nüfusu yaşlanmakta ve yaşla ilişkili çok sayıda hastalık da günden güne artmakta. Uzun yaşam süresinin getirdiği sorunlar yalnızca yaşlanan popülasyon tarafından değil, sağlık çalışanları tarafından da göğüslenmeli. Bu çalışmaya benzer nitelikteki çalışmalara, yaşlı ve ileri yaşlı olgulardaki dermatolojik hastalıkların epidemiyolojisinin ortaya konması açısından ihtiyaç vardır.

Anahtar Sözcükler: İleri Yaşlı; Dermatolojik Hastalıklar/Epidemiyoloji; Dermatolojik Hastalıklar, Bakteriyel/Epidemiyoloji; Dermatolojik Hastalıklar, Viral/Epidemiyoloji.

Correspondance

Ahu YORULMAZ
Ankara Numune Training and Research Hospital,
Dermatology Clinic, ANKARA

Phone: 0312 508 40 00
e-mail: ahuyor@gmail.com

Received: 07/10/2016

Accepted: 19/11/2016

Ankara Numune Training and Research Hospital,
Dermatology Clinic, ANKARA

Introduction

Aging has been characterized as a complex and multifactorial phenomenon. Although several theories have been proposed to explain the fundamentals of ageing, the underlying mechanism of ageing is considered to have both genetic and environmental components (1). Given the marked increase in the number of older individuals worldwide (2,3), studies investigating the diseases in the elderly population are on the rise (4,5). Moreover, a growing number of studies are specifically concerned with diseases in the oldest old (3-7). In this retrospective single-centre study, we attempted to investigate the frequency of dermatological disorders in the oldest old, who are defined as individuals aged ≥85 years (8).

Materials and Method

We retrospectively reviewed the medical records of all patients aged ≥85 who were admitted to our outpatient clinic between June 2011 and June 2016. The study was conducted in accordance with the Declaration of Helsinki and was approved by the medical ethical committee of Ankara Numune Training and Research Hospital, Turkey (Protocol no: 2016-1178). The following clinical and demographic data were obtained from the records: age, sex and clinical diagnoses of dermatological diseases. Dermatological diseases were categorized into 15 groups: dermatoses resulting from physical factors, pruritus/pruritic dermatoses, infections, papulosquamous and eczematous dermatoses, urticarias and drug reactions, neoplastic changes, cutaneous lymphomas, blistering dermatoses, cutaneous vascular diseases, leg ulcers, pigmentary disorders, oral mucosal diseases, nail diseases, hair disorders, photodermatoses. Patients were classified to different groups based on age (with 10-year increments) (Group 1, 85–94 years; Group 2, 95–104 years; Group 3, 105–114 years).

Statistical analysis was performed using SPSS software, Version 16 (SPSS Inc., Chicago IL, USA). Frequencies were calculated for variables related to demographic and clinical patient characteristics. Age was analysed as a continuous variable and described as mean±standard deviation and range. Chi-square test or Fisher's exact test was used to determine if there were statistical associations between disease groups and age and disease groups and sex. $p<0.05$ was accepted as "statistically significant".

Results

A total of 1255 consecutive patients [males, 623 (49.6%); females, 632 (50.4%); mean age, 87.65±2.97 years (range, 85–113 years)] were enrolled in the study. Majority of the patients were in Group 1 (97.7%, $n=1226$), while 2.1% ($n=26$) were in Group 2 and 0.2% ($n=3$) were in Group 3. At least one dermatological diagnosis was confirmed in each patient. Two kinds of dermatological diseases were diagnosed in 11.6% of patients ($n=145$), three kinds in 1.6% ($n=20$) and four kinds in 0.5% ($n=6$). The most frequently recorded dermatological disease group was pruritus/pruritic dermatoses (26.8%, $n=383$). The second most frequent disease group was infectious diseases, with an incidence rate of 24.5% ($n=351$), and neoplastic changes was the third most frequent disease group, with an incidence rate of 19.5% ($n=279$). Xerosis/asteatotic dermatitis was the most frequent disease (14.5%, $n=208$) (Table 1). There was no statistically significant relationship between age and type of dermatological diseases (Table 2). Regarding the association between sex and disease group, a statistically significant relationship was established only for dermatoses resulting from physical factors, which were significantly more likely to occur in males (61.1% vs. 38.9%, $p=0.034$) (Table 2).

Discussion

Life expectancy has increased worldwide. The oldest old, who are defined as people ≥85 years, have been the fastest growing part of the ageing population, especially in developed countries. As this population is more susceptible to age-related changes, the overall frequency of diseases in them has also increased (2). Several studies have focussed on diseases in the oldest old (3-7). However, to the best of our knowledge, there are no studies on the frequency of dermatological disorders in the oldest old.

In our study, we reviewed the medical records of 1255 patients over a period of 5 years. The most frequently recorded dermatological disease group was pruritus/pruritic dermatoses, and the most frequent disease was xerosis/asteatotic dermatitis, which was categorized in this disease group. Dry skin (xerosis) is one of the most common dermatological conditions and is the most common cause of pruritus in geriatric patients. Although the exact aetiology of xerosis is not fully understood, both intrinsic and extrinsic factors have been suggested to influence the development of xerosis in geriatric patients. Xerosis results from not only decreased water content and sebum production of the skin but also increased number and size of corneocytes, which are the primary cell type of the stratum corneum, the outermost part of the epidermis. Environmental factors, such as dry and cold weather, low humi-

Table 1— Frequencies of Dermatological Diseases in the Study Group.

Disease	n	%
Dermatoses resulting from physical factors	**90**	**6.3**
Traumatic lesions, friction blisters, thermal injuries, callosities	67	4.7
Pressure sores (decubitus ulcers)	23	1.6
Pruritus/pruritic dermatoses	**383**	**26.8**
Xerosis/Asteatotic dermatitis	208	14.5
Pruritus	86	6.0
Pruritus ani/scroti/vulvae	27	1.9
Scalp pruritus/dysesthesia	25	1.7
Glossodynia	6	0.4
Neurocutaneous dermatoses (lichen simplex chronicus, prurigo nodularis, neurotic excoriation)	31	2.2
Infections	**351**	**24.5**
Bacterial infections (impetigo/folliculitis, erythrasma, cellulitis/erysipelas)	92	6.4
Viral infections	47	3.3
Herpes simplex virus infection, human papillomavirus infection	3	0.2
Herpes zoster	44	3.1
Fungal infections	212	14.8
Onychomycosis	54	3.8
Tinea pedis/cruris/corporis	98	6.8
Candidiasis, pityriasis versicolor	43	3.0
Infestations (Pediculosis, scabies, insect bite reactions)	17	1.2
Papulosquamous and eczematous dermatoses	**97**	**6.8**
Inflammatory dermatoses	27	1.9
Psoriasis	11	0.8
Lichen planus	3	0.2
Rosacea	7	0.5
Vasculitis	6	0.4
Eczematous reactions	70	4.9
Nummular eczema	7	0.5
Seborrheic dermatitis	19	1.3
Contact dermatitis	27	1.9
Gravitational eczema	17	1.2
Urticarias and drug reactions	**29**	**2.0**
Urticaria	13	0.9
Cutaneous drug reactions	16	1.1
Neoplastic changes	**279**	**19.5**
Benign	188	13.2
Seborrheic keratosis	47	3.3
Cysts (epidermoid, trichilemmal, milium)	37	2.6
Others (xanthelasma, gouty tophus, calcinosis cutis, keratoacanthoma, chondrodermatitis nodularis helicis, sebaceous hyperplasia, cherry angioma, keloid, lipoma, skin tag, senile comedone)	104	7.3
Premalignant/malignant	91	6.3
Actinic keratosis/cheilitis	40	2.8
Bowen's disease	6	0.4
Cutaneous horn	5	0.3
Basal cell carcinoma	18	1.3
Squamous cell carcinoma	12	0.8
Lentigo maligna/melanoma	4	0.3
Kaposi sarcoma	4	0.3
Cutaneous metastases	2	0.1

(Continued)

Table 1— Frequencies of Dermatological Diseases in the Study Group. *(Continued)*

	n	%
Cutaneous lymphomas (Mycosis fungoides)	**6**	**0.4**
Blistering dermatoses (Bullous pemphigoid)	**15**	**1.0**
Cutaneous vascular diseases	**25**	**1.7**
Chronic venous insufficiency/thrombosis	14	1.0
Senile purpura	9	0.6
Pigmented purpuric dermatosis	2	0.1
Leg ulcers	**10**	**0.7**
Venous ulcers	2	0.1
Neuropathic ulceration	8	0.6
Pigmentary disorders (Vitiligo)	**8**	**0.6**
Oral mucosal diseases	**51**	**3.5**
İrritated fibroma, frictional hyperkeratosis, aphthous ulcer, sublingual varices, venous lake	15	1.0
Oral candidiasis	29	2.0
Glossitis	7	0.5
Nail diseases	**41**	**2.8**
Infections of the nail and nail folds	6	0.4
Nail deformities and dystrophies/traumatic lesions (onychocryptosis, subungual hematoma, onycholysis, onychogryphosis)	35	2.4
Hair disorders (Senile alopecia)	**9**	**0.6**
Photodermatoses	**37**	**2.6**
Solar lentigo, poikilodermic changes	31	2.2
Cutis rhomboidalis nuchae, Favre-Racouchot syndrome	6	0.4

Table 2— Relationship of Sex and Age with Diseases.

Disease	Age	Sex
	p	*p*
Dermatoses resulting from physical factors	0.057	0.034*
Pruritus/pruritic dermatoses	0.895	0.226
Infections	0.731	0.469
Papulosquamous and eczematous dermatoses	0.076	0.053
Urticarias and drug reactions	0.841	0.267
Neoplastic changes	0.511	0.455
Cutaneous lymphomas	0.931	0.687
Blistering Dermatoses	0.836	1.000
Cutaneous vascular diseases	0.769	0.440
Leg Ulcer	0.888	1.000
Pigmentary disorders	0.909	0.726
Oral mucosal diseases	0.937	0.168
Nail diseases	0.938	0.786
Hair disorders	0.898	1.000
Photodermatoses	0.921	0.533

dity and drying agents, generally trigger and aggravate the condition. Asteatotic dermatitis, characterized by dry cracked eczematous lesions, is a consequence of xerosis (9-12). Several epidemiological studies have reported a high incidence of pruritus and xerosis/asteatotic dermatitis in geriatric patients (11,13-18). Our study has demonstrated for the first time that pruritus/pruritic dermatoses is the most common disease category and xerosis/asteatotic dermatitis is the most common

dermatological condition in the oldest old, with frequency rates of 26.8% and 14.5%, respectively.

Infectious diseases was the second most common dermatological disease category in our patients. Several studies on the frequency of dermatological disorders in the elderly have also reported infections as one of the most common disease groups (13,15,16). Our study results have revealed that within this group, fungal infections constitute the largest proportion and infestations the smallest. In our study, although viral infections was third in order of frequency (3.3%), herpes zoster, one of the diseases categorized in this group, had a high overall frequency of 3.1%. As the cell-mediated immunity specific for varicella-zoster virus, responsible for herpes zoster, diminishes physiologically with the ageing process, the incidence of herpes zoster increases significantly with advancing age. The exact incidence and prevalence of herpes zoster in the oldest old are not known. Herpes zoster has been reported to affect 20%–30% of individuals in the general population at some point in their lifetime, and up to 50% of those are older than 80 years (19). However, these statistics reflect the lifetime risk of developing herpes zoster, and because our study shows the frequency of the disease, we suggest that these results should not be misconceived. Further, to the best of our knowledge, this is the first study to have focussed on the frequency of dermatological disorders in the oldest old.

Another disease category investigated in this study was neoplastic diseases. It is assumed that rapid growth of the geriatric population will result in a marked increase in the number of subjects with malignancies (20). Individuals with skin malignancies will represent a non-negligible fraction of this population. The major risk factors for skin malignancies are sun exposure, family history and skin type. Ageing is another primary determinant in the genesis of skin cancers because of the increased cumulative effect of sun exposure and carcinogens and deteriorating DNA repair capacity with the ageing process (21). We have assessed the frequency rates of both benign and malignant neoplastic changes. However, at least for this time period, these results may be considered as beyond the discussion of this work, since this is the first study evaluating these particular frequencies in the oldest old.

There are other disease categories reviewed in this study, such as papulosquamous and eczematous dermatoses, urticarias and drug reactions, cutaneous vascular diseases, oral mucosal diseases and nail diseases. We have also considered these diseases as beyond the discussion of this work, since our study is the first study investigating the frequencies of these diseases and there are not any study in the literature allowing for a conclusive comparison. On the other hand, if we take the example of psoriasis, which is one of the most common dermatological disorder with a reported prevalence as high as 4.8%, it has been recognised as a non-geriatric disease, having a bimodal distribution of age of onset with peaks at the second and the fifth decades (22). In a study on elderly-onset psoriasis, Kwon et al. have reported that 3.2% of all psoriasis patients have disease onset in the geriatric age group older than 60 years. In this study the percentage of patients whose age onset was above 80 constituted 0.1% of the study population. Moreover, Kwon et al. have also suggested that the elderly-onset group demonstrated lower psoriasis area severity index scores, less extensive body surface involvement, and milder activity of individual lesions compared with early- and middle age-onset groups (23). As seen, it was not possible to make an overall comparison for each particular disease because of the limited amount of data in the literature.

Other major aims of this study were to determine the relationships of age and sex with the type of dermatological diseases. This study found a statistically significant correlation only between dermatoses resulting from physical factors and sex. These results suggest the need to investigate these associations with a larger population of the oldest old, especially centenarians. The study covered a period of 5 years and reviewed the medical records of 1255 patients. However, the majority of the patients (97.7%) were aged between 85 and 94 years, 2.1% between 95 and 104 years and only 0.2% between 105 and 114 years. Because of small number of patients in age groups between 95 years and above, statistical analysis yielded speculative results. The association of dermatoses resulting from physical factors with sex should be further investigated based on our preliminary results. In conclusion, we emphasize the importance of studies on the epidemiological aspects of dermatological diseases in the oldest old considering the increase in the elderly population (2,3).

REFERENCES

1. Cristofalo VJ, Gerhard GS, Pignolo RJ. Molecular biology of aging. Surg Clin North Am 1994;74(1):1-21. (PMID:8108762).
2. Christensen K, Doblhammer G, Rau R, Vaupel JW. Ageing populations: the challenges ahead. Lancet 2009;374(9696):1196-208.(PMID:19801098).
3. Engberg H, Oksuzyan A, Jeune B, Vaupel JW, Christensen K. Centenarians-a useful model for healthy aging? A 29-year follow-up of hospitalizations among 40,000 Danes born in 1905. Aging Cell 2009;8(3):270-6. (PMID:19627266).

4. Chuang TJ, Huang CL, Lee CH, et al. The differences of metabolic syndrome in elderly subgroups: A special focus on young-old, old-old and oldest old. Arch Gerontol Geriatr 2016;65(1):92-7. (PMID:27016645).
5. Kawas CH, Kim RC, Sonnen JA, Bullain SS, Trieu T, Corrada MM. Multiple pathologies are common and related to dementia in the oldest-old: The 90+ Study. Neurology 2015;85(6):535-42. (PMID:26180144).
6. Herr M, Arvieu JJ, Robine JM, Ankri J. Health, frailty and disability after ninety: Results of an observational study in France. Arch Gerontol Geriatr 2016;66:166-75. (PMID:27341649).
7. Leibowitz D, Jacobs JM, Gilon D, Lande-Stessman I, Ein-Mor E, Stessman J. Cardiac structure and function and frailty in subjects aged 85 and 86 years. Am J Cardiol 2016;118(5):760-4. (PMID:27445215).
8. Suzman R, Riley MW. Introducing the "oldest old".Milbank Mem Fund Q Health Soc 1985;63(2):177-86.(PMID:3846808).
9. Norman RA. Geriatric dermatology. Dermatol Ther 2003;16(3):260-8.(PMID:14510883).
10. White-Chu EF, Reddy M. Dry skin in the elderly: complexities of a common problem. Clin Dermatol 2011;29(1):37-42. (PMID:21146730).
11. Norman RA. Xerosis and pruritus in the elderly: recognition and management. Dermatol Ther 2003;16(3):254-9.(PMID:14510882).
12. Garibyan L, Chiou AS, Elmariah SB. Advanced aging skin and itch: addressing an unmet need. Dermatol Ther 2013;26(2):92-103. (PMID:23551366).
13. Kiliç A, Gül U, Aslan E, Soylu S. Dermatological findings in the senior population of nursing homes in Turkey. Arch Gerontol Geriatr 2008;47(1):93-8. (PMID:17826853).
14. Yap KB, Siew MG, Goh CL. Pattern of skin diseases in the elderly seen at the National Skin Centre (Singapore) 1990. Singapore Med J 1994;35(2):147-50.(PMID:7939809).
15. Smith DR, Guo YL, Lee YL, Hsieh FS, Chang SJ, Sheu HM. Prevalence of skin disease among nursing home staff in southern Taiwan. Ind Health 2002;40(1):54-58.(PMID:11926516).
16. Yalçin B, Tamer E, Toy GG, Oztaş P, Hayran M, Alli N. The prevalence of skin diseases in the elderly: analysis of 4099 geriatric patients. Int J Dermatol 2006;45(6):672-6. (PMID:16796625).
17. Paul C, Maumus-Robert S, Mazereeuw-Hautier J, Guyen CN, Saudez X, Schmitt AM. Prevalence and risk factors for xerosis in the elderly: a cross-sectional epidemiological study in primary care. Dermatology 2011;223(3):260-5. (PMID:22104182).
18. Bilgili SG, Karadag AS, Ozkol HU, Calka O, Akdeniz N. The prevalence of skin diseases among the geriatric patients in Eastern Turkey. J Pak Med Assoc 2012;62(6):535-9. (PMID:22755334).
19. Johnson RW, Alvarez-Pasquin MJ, Bijl M, et al. Herpes zoster epidemiology, management, and disease and economic burden in Europe: a multidisciplinaryperspective. Ther Adv Vaccines 2015;3(4):109-20. (PMID:26478818).
20. Berger NA, Savvides P, Koroukian SM, et al. Cancer in the elderly. Trans Am Clin Climatol Assoc 2006;117(1):147-55. (PMID:18528470).
21. Malaguarnera G, Giordano M, Cappellani A, Berretta M, Malaguarnera M, Perrotta RE. Skin cancers in elderly patients. Anticancer Agents Med Chem 2013;13(9):1406-11. (PMID:24102278).
22. Griffiths CEM, Barker J.N.W.N. Psoriasis. In: Burns T, Breathnach S, Cox N, Grittiths C, eds. Rook's Textbook of Dermatology. 8th ed. Oxford: Wiley-Blackwell 2010, pp 20, 1-60.
23. Kwon HH, Kwon IH, Youn JI. Clinical study of psoriasis occurring over the age of 60 years: is elderly-onset psoriasis a distinct subtype? Int J Dermatol 2012;51:53-8. (PMID:22182378).