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Original Article DERMATOLOGY

Adherence to dermatologic treatment: A retrospective cross-sectional study on geriatric patients

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ABSTRACT

OBJECTIVE: With the prolongation of the average life expectancy worldwide, diseases including dermatological disorders of the elderly are gaining importance. The presence of comorbidities in this age group may affect the treatment strategies; compliance with follow-up and adherence to medication can be poor. The aim of this study is to evaluate the dermatological disorders of patients aged 65 and over and determine their adherence to dermatologic treatment.

METHODS: A retrospective and cross-sectional study was conducted on patients aged 65 and over applied to a single tertiary dermatology clinic between April 2021 and April 2022. Diagnoses were that clinical and diagnostic tests were performed when only necessary.

RESULTS: A total of 207 admissions to the dermatology clinic by 135 patients were evaluated. Eczema (23.05%) and infections (25.2%) were the most common dermatological diagnoses. The percentage of patients with precancerous and cancerous lesions was 11.9%. Among 123 patients who need at least a follow-up visit, only 37 patients (30.1%) applied for follow-up as advised, and medicines were taken regularly by 23 of these patients (62.2%). Compliance with follow-up was lower among men (OR 0.365, 95% CI 0.160–0.834, and p=0.02) and patients who were treated only with local therapy agents (OR 0.345, 95% CI 0.138–0.863, and p=0.20).

CONCLUSION: Eczema and infections were the most common dermatological diagnoses among geriatric patients in the present study. The majority of geriatric patients with skin conditions were not applying for follow-up visits. Women and patients treated with systemic therapy agents were more compliant. The prevalence of basal cell carcinoma was not low, and this emphasizes the importance of a careful dermatological examination regardless of primary complaint in this age group.

Keywords: Basal cell carcinoma; eczema; geriatric; skin disorders; treatment.

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The population aged 65 and over, which is considered as the geriatric population, increased by 24% in the past 5 years in Turkiye [1]. According to population projections, it was predicted that the proportion of the elderly population would be 11% in 2025 and 16.3% in 2040 [1]. With the prolongation of the average life expectancy all over the world, especially in developed and developing countries, physicians will see increasing numbers of patients over the age of 65 years [2]. Dermatologists, like physicians from all other branches, have already begun to encounter the diseases of this group of patients more frequently [3, 4]. The presence of comorbidities in this age group can complicate the diagnosis and treatment choices [5]. Moreover, compliance with follow-up and adherence to medication can be poor [6]. In this age group, non-compliance

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can be observed in many ways including not taking the medications, not taking them as prescribed, using non-prescribed medications, and missing follow-ups [7]. Although there are several studies on statistical data of skin disorders among geriatric patients from our country, it is not clear the ratio of compliance with follow-up and adherence to dermatologic medication. The aim of this study is to evaluate the dermatological diseases among geriatric patients applied to the dermatology clinic, their treatments, and responses as well as to determine their adherence to dermatologic treatment including follow-up and medication.

MATERIALS AND METHODS

This retrospective, cross-sectional, and single-center study was conducted on patients aged 65 and over who applied to the author's clinic at a tertiary healthcare institution between April 2021 and April 2022. Patients aged 65 and over who applied to the clinic within the planned period of retrospective study were detected from the electronic health records and the ages, genders, dermatological signs and symptoms, diagnoses, planned treatments, compliance with planned follow-up, adherence to medications, and treatment responses were recorded. All patients were examined and treated by a single dermatologist. This study complies with the Declaration of Helsinki and was performed according to local ethics committee approval (2022-09/01).

Statistical Analysis

The data were tabulated for statistical analysis with SPSS-22 software (SPSS Inc., Chicago, IL, USA). Continuous data were presented as means ± standard deviation (SD), and range. Chi-square test or Fisher's exact test was used to compare categorical variables. Student's t-test was used to compare continuous variables. Values of $p<0.05$ were considered statistically significant.

RESULTS

Between a total of 4962 applications to the dermatology clinic from all age groups during 1 year, 207 applications (4.7%) of 135 patients aged 65 and over (70 men and 65 women) were detected. The male-to-female ratio was 1.07 among this group. The mean age of the patients was 72.61±5.84 years (age range, 65–89 years). While the mean age of the female patients was 71.66±5.49 years (age range, 65–89 years), it was 73.50±6.00 years (age range, 65–89 years) among the male patients. There was statistically no significant difference between genders in terms of age ($p=0.068$). Two-third of the patients (66.6%) were within the age group of 65–74. The general features of the study's patients were summarized in Table 1. The most common group of disorders was inflammatory skin disorders (31.8%) followed by infections (25.2%) (Table 2). The most common dermatosis was lichen simplex chronicus (23.0%), followed by pruritus (8.1%), onychomycosis (7.4%), seborrheic keratosis (6.6%), basal cell carcinoma (BCC) (5.9%), herpes zoster (5.9%), urticaria (4.4%), rosacea (5.2%), irritant contact dermatitis (5.2%), and others. Among the eczematous presentations (23.0%), the most common presentation was of lichen simplex chronicus (n=12, 8.8%) followed by irritant contact dermatitis

Highlight key points

- Eczema and infections were the most common dermatological diagnoses among geriatric patients.
- The majority of geriatric patients with skin conditions were not applying for follow-up visits.
- Women and patients treated with systemic therapy agents were more compliant with the follow-up during dermatologic treatment.

Table 1. General features of the presented series

Number of patients	135
Male (%)	70 (51.9)
Female (%)	65 (48.1)
Age	72.61±5.84 years (65–89)
Male	73.50±6.00 years (65–89)
Female	71.66±5.49 years (65–89)
Diagnostic laboratory tests n (%)	33 (24.4)
Number of biopsies, n (%)	13* (9.6)
Treatment types, n (%)	
Topical	68 (50.4)
Topical±systemic	37 (27.4)
Wait-and-see	7 (5.2)
Cryosurgery	7 (5.2)
Electrocauterization	2 (1.5)
Excision	17* (12.6)
Patients visited for follow-up	37
Total number of follow-up visits	72
Patients reported medication adherence	23

*: Basal cell carcinoma and Bowen's disease were excised by a plastic surgeon after the punch biopsy revealed the diagnosis.

Table 2. Main groups of skin disorders

Inflammatory skin disorders n (%)	43 (31.8)	Eczema, n (%)	31 (23.0)	Lichen simplex chronicus (%)	12 (8.8)
				Allergic contact dermatitis (%)	3 (2.2)
				Irritant contact dermatitis (%)	7 (5.2)
				Seborrheic dermatitis (%)	5 (3.7)
				Nummular dermatitis (%)	4 (3.0)
		Other, n (%)	12 (8.8)	Rosacea (%)	7 (5.2)
				Psoriasis (%)	4 (3.0)
				Drug eruption (%)	1 (0.7)
Infections n (%)	34 (25.2)	Fungal, n (%)	16 (11.9)	Onychomycosis (%)	10 (7.4)
				Tinea pedis (%)	3 (2.2)
				Tinea corporis (%)	1 (0.7)
				Candidiasis (%)	2 (1.5)
		Bacterial, n (%)	8 (5.9)	Cellulitis (%)	3 (2.2)
				Abscess (%)	3 (2.2)
				Bacterial paronychia (%)	2 (1.5)
		Viral, n (%)	8 (5.9)	Herpes Zoster (%)	8 (5.9)
		Parasitic	2 (1.5)	Scabies (%)	2 (1.5)
Precancerous and cancerous skin lesions n (%)	16 (11.9)	Precancerous, n (%)	6 (4.45)	Actinic keratosis (%)	5 (3.7)
				Bowen's disease (%)	1 (0.7)
		Cancerous, n (%)	10 (7.4)	Basal cell carcinoma	8 (5.9)
				Kaposi's sarcoma (%)	1 (0.7)
				Lymphoma metastasis (%)	1 (0.7)

Table 3. Comparison between compliant and non-compliant patients in terms of age, sex, and type of medication

	Compliant patients	Non-compliant patients	Statistics
Mean age, y	71.97±5.65	73.12±6.02	p=0.327
Gender, n (female/male)	26/11	44/54	OR 0.365, 95% CI 0.160–0.834, p=0.02
Type of medication, n (systemic/topical)*	15/12	25/56	OR 0.345, 95% CI 0.138–0.863, p=0.20

*: Twenty-seven patients were excluded who were not given any topical or systemic dermatological therapy.

(n=7, 5.2%), seborrheic dermatitis (n=5, 3.7%), nummular dermatitis (n=4, 3.0%), and allergic contact dermatitis (n=3, 2.2%) (Table 2). The most common eczema localization was in hands (n=9), followed by feet (n=7), legs (n=6), and others (n=8). Although eczema cases are accompanied by itching at varying rates, the percentage of patients whose primary complaint is itching without any lesions was 8.1%. Among the infections, the most common infection was dermatophyte infections (10.4%), followed by herpes zoster (5.9%) and scabies (1.5%) (Table 2). The percentage of patients with precancerous and cancerous lesions was 11.9%. Of the 10 patients presented with primary cutaneous malignancy, eight patients (seven males and one female) presented with BCC, one with Bowen's dis-

ease, and the other with Kaposi's Sarcoma (KS) (Table 2). All of the primary cutaneous carcinomas were newly diagnosed except KS which the patient was diagnosed with 8 years ago. Skin metastasis of systemic non-Hodgkin lymphoma presented with a dense nodule on the chest was seen in one female patient. All the cases with cutaneous carcinoma were confirmed by histopathologic evaluation through punch biopsy and re-excised by a plastic surgeon after revealing the diagnosis. Five of the BCC cases were located on the nose, one was on the forehead and the other one was on the back of the hand. Only in one patient, multiple lesions of BCC were seen on different locations (forehead, cheek, and lower lip). Bowen's disease was located on the shoulder of one male patient. The duration of the existence of skin cancer before diagnosis ranged from 2 months to 15 years (median and 1 year). All of the actinic keratosis (n=5) developed on the head and face.

Total clinic visits (n=207) consisted of 135 first applications and 72 follow-up visits of 37 patients. Topical (n=68) or systemic ± topical treatments (n=37) were planned in 105 patients in their first visits. In the rest of the patients, excision, cryosurgery, or electrocauterization were applied, or wait-and-see approach was adopted (Table 1). The medical records showed that 123 (91%) patients were advised to apply for at least a follow-up appointment at the time of their first submission. The overall compliance with follow-up was calculated as 30.1% (37/123) in these patients. Compliance with follow-up was lower in males compared to females (Chi-square, OR 0.365, 95% CI 0.160–0.834, and p=0.02) (Table 3). Furthermore, it was lower in patients treated with only topical therapy compared to systemic±topical therapy (Chi-square, OR 0.345, 95% CI 0.138–0.863, and p=0.20) (Table 3). There was not a significant difference between compliant and non-compliant patients in terms of age (Table 3). Self-reported adherence to medication by those complying with scheduled clinic visits was 62.2% (23/37). Among these patients, full remission was seen in nine and partial remission was seen in 14 patients during varying numbers of follow-up visits. All four patients who were given systemic steroid therapy due to eczema or urticaria were compliant with the follow-up and showed adherence to treatment; full remission was seen. Among the four patients who were treated with systemic antifungal drugs, three continued their follow-up and almost fully recovered without any side effects. Two of the eight patients with herpes zoster who were treated with systemic anti-viral drugs applied for a second visit and showed remission. Among nine patients who were treated with systemic antibiotics, five patients reapplied and showed remission. In the patient who was treated with methotrexate for 1 year, the treatment was continued with ustekiunmab due to unresponsiveness in the former one. The rest of the systemic drugs used in the series were anti-histaminic drugs.

DISCUSSION

Turkiye is expected to be considered an "aged" society by 2040 since the percentage of elderly will be higher than 14% [1]. Since the geriatric population constitutes a quickly growing part of the population in our country as the rest of the world, physicians and medical systems need to adapt to new population characteristics according to the needs of the geriatric community [2]. Thus, determining the prevalence and types of skin diseases in geriatric patients is very important in planning the prevention and treatments in this age group.

Throughout the aging process, skin shows degenerative structural, metabolic, and physiological changes that occur due to intrinsic and extrinsic aging, the latter is mainly due to solar radiation [8]. Due to these changes, skin disorders are more commonly seen in the elderly population and the distribution of skin diseases is different from other age groups [9]. Moreover, systemic comorbidities which are commonly exist in the elderly may worsen skin conditions, restrict to generate optimal treatments on dermatological disorders, or cause new skin problems in this age group [10].

Although eczematous skin disorders (lichen simplex chronicus, atopic dermatitis, contact dermatitis [allergic and irritant], nummular eczema, and seborrheic dermatitis) are not considered fatal, they were found to be the most common group of skin diseases in geriatric patients in most of the studies, carry high morbidity, and significantly decrease the quality of life of the elderly [11]. Similar to the literature, different types of eczema constituted the majority of skin disorders (31%) among geriatric patients of the present study. Lichen simplex chronicus, which was seen as the most common presentation of eczematous disorders among presented patients, is characterized by a variety of pruritic and lichenified lesions in irregular shapes [12]. It may involve anywhere on the body including mainly the legs, arms, neck, upper trunk, and genital region [12]. Although geriatric patients' sensibility to allergic contact dermatitis is expected to be low due to decreased delayed-type hypersensitivity reaction and vascular reactivity compared to other age groups, irritant contact dermatitis is expected to be common among the

geriatric population due to behavioral changes including decreased care and cognition and immobility and skin changes including decreased lipid content, skin dryness, impaired epidermal barrier, and immune function [11]. Although eczema cases are accompanied by itching at varying rates, the percentage of patients whose primary complaint is itching without any lesions was not low (8.1%) among the presented series. In elderly patients, pruritus can be caused by a variety of conditions, but the most frequent cause is skin dryness [13]. Skin dryness is a very common skin problem in the elderly population due to many factors including decreased lipid content [14]. Since pruritus can be a disease itself or a symptom of a systemic disease in the elderly, geriatric patients need a detailed evaluation [15].

The second largest group of skin disorders was infections in this study, which is concordant with the data in the literature [16–19]. Tinea pedis (2.2%) and onychomycosis (7.4%) were the most common fungal infections in the present study. This is probably due to the commonly observed habits of the community such as leaving the feet wet after contact with water [18]. Viral infections, especially herpes zoster, appear commonly in the elderly patients (5.9%) due to the expected weakness in the immune system by aging [19]. The lifetime risk of herpes zoster was reported about 20–30% which increases with age and it is important not to forget that herpes zoster can make a huge impact on elderly patients due to the long-standing pain and can lead to the inability to recover the lifestyle [19].

The percentage of patients with precancerous and cancerous lesions was 11.9% in the presented series. The ratio of primary skin carcinomas was 7.4% and BCC constituted the majority. Although all of the BCCs were located on sun-exposed areas of the presented patients, it is very important to examine the elderly patients carefully regardless of primary complaint [20]. Moreover, the ratio of patients who presented with AK emphasizes the importance of regular follow-up in geriatric patients, especially in fair skin types and strongly advising the use of sunscreens in this age group [20].

Patients with skin diseases usually need to apply to dermatology clinics repeatedly due to the chronic nature of the skin diseases or slow response to treatments [21]. Thus, compliance with follow-up and adherence to treatment is always difficult for all individuals with chronic skin diseases [22]. However, it is even more difficult and low in elderly patients due to multiple factors including lack of motivation, impaired cognition, possible vision problems or handicaps, or difficulties in reaching the health-care facilities due to transportation problems [23, 24]. Compliance has been defined as a patient's behavior toward treatment and also includes following the scheduled follow-up visits, taking medications regularly as prescribed, and following all the suggestions [24]. The overall compliance with appointments was calculated as very low (27.4%) and medicines were taken regularly by 62.1% of the attendant patients in the present study. Although it is concordant with the literature that female patients were more compliant with the follow-up, as far as we know the compliance's being higher among the patients treated with systemic therapies seems to be a new finding [8]. It is probably due to the fear of side effects caused mainly by the warnings from the physician or general belief. Although simple topical regimens are more likely to be preferable to maximize compliance and efficacy according to the literature, our results showed that a systemic treatment approach with a close follow-up can be an effective and controllable choice compared to topical treatments in suitable situations [17].

The main limitation of this study was its retrospective design. Due to the very low compliance to follow-up among the presented patients, a clear evaluation of self-reported adherence to medication was not fully possible.

Conclusion

Skin diseases, especially eczematous conditions and infections, are common among the geriatric population. Management is often less than optimal due to the limitations of this age group. Comorbidities may restrict treatment plans and compliance can be poor; therefore, it is important to adopt a realistic approach toward the dermatological diseases of the elderly. The prevalence of precancerous and cancerous being not low emphasizes the importance of a careful dermatological examination regardless of the primary complaint in all patients.

Ethics Committee Approval: The Bahcesehir University Clinical Research Ethics Committee granted approval for this study (date: 01.06.2022, number: 2022-09/01).

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