

An observational study of physiological and pathological skin changes in the geriatric population

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ABSTRACT

Background: Elderly individuals often present with a broad range of dermatological issues. While skin conditions are more common in older adults, many are typical skin disorders whose manifestations, emotional impact, and management may be influenced by aging and the associated health challenges that come with it. **Materials and Methods:** This study involved patients aged 60 and older who visited the dermatology and geriatrics outpatient departments at a tertiary care hospital. Recruitment continued until a sample size of 375 was obtained. A pre-designed proforma was used to collect demographic information, detailed medical histories, clinical examinations, and relevant laboratory investigations for each participant. **Results:** A total of 375 patients participated in the study, with the majority (58.7%, n = 220) falling within the 60–69 age range. Among the participants, 218 (58.1%) were male and 157 (41.9%) were female. Wrinkling was the most common physiological sign, affecting 74.7% of the patients, followed closely by xerosis, which was seen in 73.3%. In terms of pathological skin conditions, eczema was observed in 7.2% of the patients, fungal infections in 6.1%, and psoriasis in 5.9%. **Conclusion:** The distinction between physiological and pathological skin changes in aging is often subtle. This study highlighted the common physiological and pathological skin conditions observed in the geriatric population. A comprehensive understanding of these skin changes is crucial for dermatologists, aiding them in the effective management of elderly patients.

Key words: Geriatric, Physiological Manifestations, Pathological Changes

INTRODUCTION

Aging refers to the progressive decline in the maximum functioning and reserve capacity of all bodily organs, including the skin. Skin senescence is a gradual process that ultimately leads to the visual and functional changes we associate with old age [1]. A senior citizen or elderly individual is typically defined as someone aged 60 years or older [2]. Population aging is often seen as a success of public health policies and socioeconomic development; however, it also presents challenges for society, which must adapt to optimize the health, functional capacity, social participation, and security of older individuals [3].

Elderly patients often present a wide range of skin conditions to dermatologists. While some of these are more or less specific to old age, many are common

skin disorders, whose clinical presentation, physical and emotional impact, and treatment may be influenced by the patient's age and the challenges that come with it. The skin may also act as an indicator of various internal diseases, and aging increases the susceptibility of elderly individuals to such conditions.

Skin aging results from two primary factors: intrinsic and extrinsic aging. Intrinsic changes are natural and genetically predetermined, representing the aging process that occurs simply as time passes. In contrast, extrinsic aging refers to the skin's reaction to external environmental factors, which may be largely controlled through lifestyle choices [4,5]. There are various theories of aging—waste accumulation theory, cross-linkage theory, free radical theory, wear and tear theory, somatic mutation theory—which may individually or together result in the visible changes of aging skin [6].

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Pre-existing disease states, therapies, and medications make the aging individual more susceptible to xerosis. Some of these pre-existing situations include radiation, end-stage renal disease, nutritional deficiency, thyroid disease, and neurological disorders with decreased sweating, anti-androgen medications, diuretic therapy, human immunodeficiency virus, and malignancies [7]. Elderly individuals are susceptible to bullous autoimmune dermatoses in particular, bullous pemphigoid, cicatricial pemphigoid, epidermolysis bullosa acquisita, and paraneoplastic pemphigus [8].

Intrinsic aging of the skin occurs inevitably as a natural consequence of physiological changes over time at variable yet inalterable genetically determined rates. Extrinsic factors are, to varying degrees, controllable and include exposure to sunlight, pollution or nicotine, repetitive muscle movements such as squinting or frowning, and miscellaneous lifestyle components such as diet, sleeping position, and overall health [9].

MATERIALS AND METHODS

Source of Data

Following approval from the Institutional Ethics Committee, consecutive patients aged 60 and older who visited the dermatology and geriatrics outpatient departments (OPDs) of a tertiary care hospital were included in the study. Recruitment continued until a sample size of 375 participants was achieved.

Sample Size

The study conducted by Chopra et al. revealed that nearly 50% of the patients had xerosis, while an almost similar proportion had pathological conditions such as eczema and seborrheic keratosis. Sample size for the present study was estimated based on the frequency of xerosis, which is the commonest complaint that the elderly present with, with a relative precision of 10% and a desired confidence level of 95%.

Method of Data Collection

Patients aged 60 years and above presenting to the dermatology OPD and the geriatric OPD were recruited for the study. A predesigned proforma including demographics, detailed history, clinical examination, and relevant laboratory investigations were used for the patients recruited.

Type of Study

Cross-sectional study design.

Statistical Analysis

Statistical analysis in this study was performed using the following methods. Continuous data was expressed as means \pm standard deviations, while dichotomous data was represented as numbers and percentages. Proportions were compared using the *chi*-squared test of significance. A *p* value of less than 0.05 was considered statistically significant. Data analysis was conducted using the Statistical Package for the Social Sciences (SPSS) software.

Ethics Statement

Institutional ethics committee approval was obtained.

RESULTS

A total of 375 consecutive geriatric patients attending the dermatology and geriatrics outpatient departments (OPDs) were included in this study. The demographic data, including age, sex, and socioeconomic status, were recorded for each participant. Additionally, the physiological skin manifestations observed in the study population were systematically documented (Figs. 1a – 1d). Figs. 2a – 2c show the common pathological skin changes.

DISCUSSION

The present study was a cross-sectional study conducted in a tertiary-hospital setting. It included 375 consecutive geriatric patients (\geq 60 years of age) presenting to the geriatric and dermatology outpatient departments between 2011 and 2013. All patients were evaluated for physiological and pathological skin changes using a pre-designed proforma, and data was recorded in the same.

The percentage population distribution in the age group 60 and above constituted 8.0% of the total Indian population.

Previous studies of skin problems among the elderly have used different types of population and diagnostic groupings that are not directly comparable. Studies done on the morbidity pattern among the elderly population in various regions of our country showed a

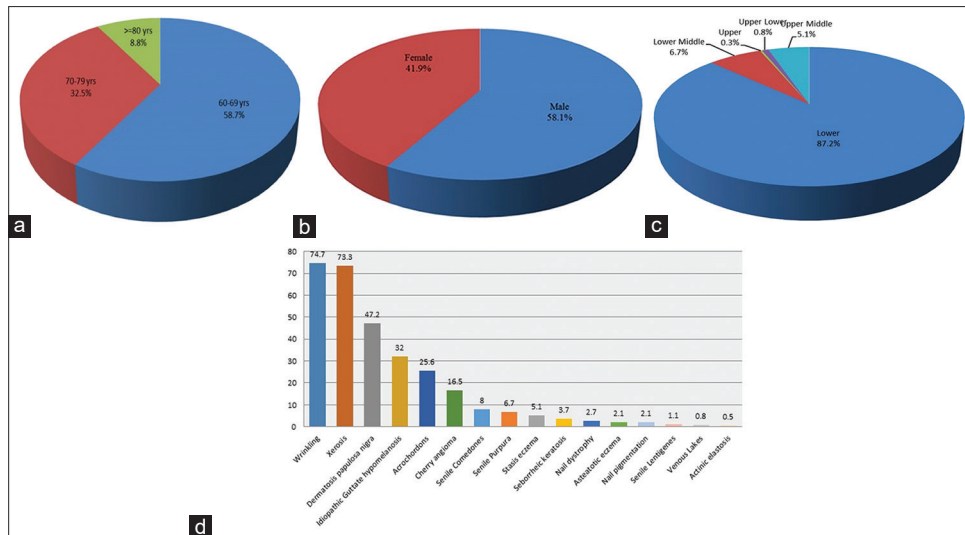


Figure 1: (a) Age distribution of the study population. (b) Sex distribution of the study population. (c) Socioeconomic status of the study population using a modified Kuppuswamy’s classification. (d) Physiological skin manifestations.

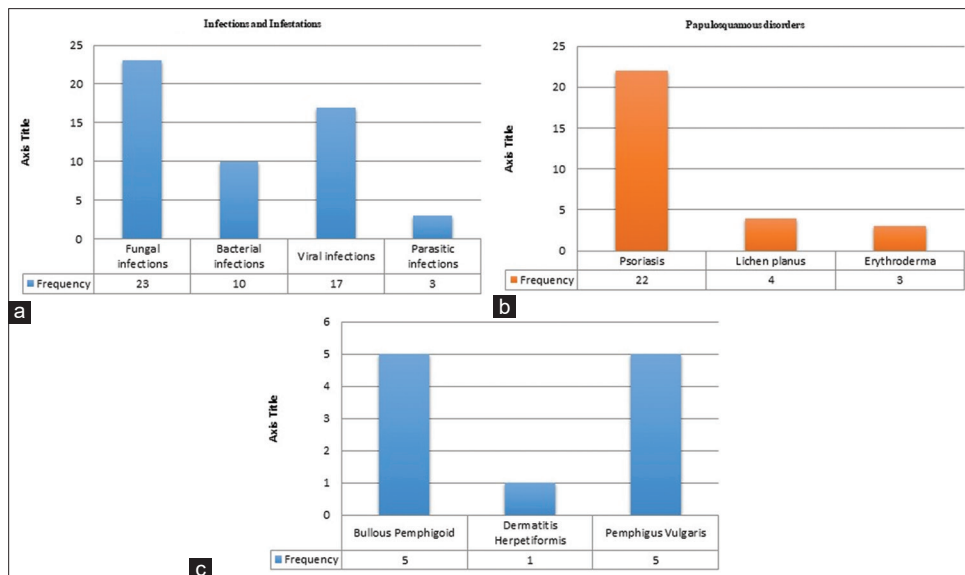


Figure 2: (a) Infections and infestations. (b) Papulosquamous disorders. (c) Vesiculobullous disorders.

prevalence of skin diseases to vary between 6.1% and 11.9 % of the total population studied.

Age Distribution

The majority of the patients in the present study were in the age group of 60–69 years (n = 220), out of the total 375 patients enrolled in the study (58.7%). Our data with respect to age distribution was in line with the previous studies (Table 1).

Sex Distribution

Out of the 375 patients studied, the number of male patients was 218 (58.1%) and the number of female

Table 1: Age distribution

Our Study	Patange et al. [11]	Yalcin et al [12]	Sahoo et al. [13]	Pavithra et al. [14]	Darjani et al. [15]
58.7%	66%	75.7%	77.5%	57.9%	57%

patients was 157 (41.9%). This finding was similar to all previous reference studies with a male preponderance (Table 2).

Physiological Skin Manifestations

In our study, the following were considered physiological changes: xerosis, wrinkling, actinic elastosis, senile lentigenes, senile comedones, cherry angioma, venous lakes, senile purpura, idiopathic guttate hypomelanosis,

Table 2: Sex distribution

	Our study	Chopra et al. [7]	Patange et al. [11]	Yalcin et al. [12]	Pavithra et al. [14]	Darjani et al. [15]
Male patients	58.1%	56%	63%	55.3%	64.7%	52.7%
Female patients	41.9%	42%	37%	44.7%	35.3%	47.3%

Table 3: Physiological skin manifestations in the elderly

Our Study (% of patients with the manifestation)	Chopra et al. [7]	Pavithra et al. [14]	Sahoo et al. [13]	Darjani et al. [15]
Wrinkling (74.7%), xerosis (73.3%)	Wrinkling (51.7%), xerosis (50.8%)	Wrinkling (99.3%), graying of the hair (96.8%)	Xerosis (12.5%)	Xerosis (11.6%)

asteatotic eczema, achrochordons/dermatosis papulosa nigricans, nail dystrophy, nail pigmentation, mucosal pigmentation, with most of the elderly having wrinkling (74.7%), followed by xerosis (73.3%).

The findings were comparable to studies done by Chopra et al. [7] and Pavithra et al. [14] yet contrasted with studies done by Sahoo et al. [13] and Darjani et al. [15]. These differences might have been due to the different geographical locations (Table 3).

In a study by Dhumale SB, Khyalappa R, fungal infections were predominantly found, 21% had Tinea and 16.5% had candida infections totalling to 37.5% of the total dermatoses in the elderly [10].

Abrupt changes in environmental temperature (e.g., cold or heat shock) and chemical or physical assaults (e.g., exposure to irritants) were identified as significant stressors affecting the skin.

Many environmental factors can also affect the physiological changes, leading to differences with rest to the geographical locations as also studied in a study by Martini L, Solime R et al [16].

Pathological Skin Changes

The pathological changes were classified into infections and infestations, papulo-squamous disorders, vesiculobullous disorders, drug rash, and miscellaneous conditions. Among the infections and infestations, there were 23 patients (6.13%) with fungal infections, 17 (4.53%) with viral infections, 10 (2.67%) with bacterial infections, and 3 (0.8%) with parasitic infestations.

Among the fungal infections, dermatophytosis was the most common, accounting for 16 of 23 patients with fungal infections. Among viral infections, 14 patients were diagnosed with herpes zoster. Seven out of 10 patients had folliculitis/furuncles, and we

had 3 patients with Hansen's disease. We encountered three elderly patients with scabies. Among the papulosquamous disorders, there were 27 patients with eczema, 22 with psoriasis, 4 with lichen planus, and 3 with erythroderma. Five cases, each with bullous pemphigoid and pemphigus vulgaris and one case of dermatitis herpetiformis, were encountered during the study period. We came across two patients with drug rash, one to salbutamol and the other to anticonvulsants.

In the study done by Chopra et al., the prevalence of skin disorders were as follows: atopic dermatitis in 40 (18.6%), LSC in 29 (13.5%), post-herpetic neuralgia in 22 (10.3%), psoriasis 12 in (5.6%), fungal infections in 12 (5.6%), PMLE in 12 (5.6%), bacterial infection in 10 (4.7%), eczema in 6 (2.8%), delusional parasitophobia in 6 (2.8%), erythroderma in 5 (2.3%), senile pruritus in 5 (2.3%), bullous pemphigoid, varicose dermatitis in 4 (1.8%), pemphigus vulgaris in 4 (1.8%), vitiligo in 2 (0.95), herpes zoster in 2 (0.9%), actinic reticuloid in 1 (0.5%), xanthelasma in 1 (0.5%), and malignant melanoma in 1 (0.5%) [7].

In the study done by Patange et al., the infective dermatoses constituted 34.5% of the total. Fungal infections (17.5%) were the most common, followed by bacterial (8.5%) and viral (5%) infections [11].

In a study done by Yalcin et al., the five most frequently encountered diseases in elderly patients were eczematous dermatitis, fungal infections, pruritus, and bacterial and viral infections [12].

In the study by Sahoo et al., most of the dermatoses encountered were of an infectious nature (30%) [13].

In the study by Pavithra et al., fungal infections (20.7%), eczemas (19.2%), papulosquamous disorders (12.3%), leg ulcers (6.6%), pigmentary disorders (5.8%), infestation (4.9%), vesiculobullous disorders (4.4%), and malignant cases (0.7%) were reported [14].

In comparison with the above studies, the most common pathological manifestation was of eczematous dermatitis in our study. This was similar to the study by Yalcin et al. [12] and Pavithra et al. [14]. Among the infectious conditions fungal infections were common in our study, as were in all the above-mentioned studies. There were no patients with malignancies encountered during the study period.

Limitations

The study was done in a particular geographical area and the majority of the study participants were from the lower economic strata. The findings of the study need to be compared, keeping in mind these differences and further large-scale studies. Many geographical locations and all strata of the society need to be taken into account to generalize the results thus obtained.

CONCLUSION

There is only a thin line of difference between the physiological and pathological skin changes due to aging. This study presented the common physiologic and pathologic skin changes noted in the geriatric population. A thorough knowledge of physiological and pathological skin changes in the geriatric population may help dermatologists in the management of such cases.

Statement of Human and Animal Rights

All the procedures followed were in accordance with the ethical standards of the responsible committee on human experimentation (institutional and national) and with the 2008 revision of the Declaration of Helsinki of 1975.

Statement of Informed Consent

Informed consent for participation in this study was obtained from all patients.

Comment

The present study offers a comprehensive overview of cutaneous manifestations in the elderly, distinguishing between physiological changes such as xerosis and wrinkling, and pathological dermatoses including eczema, fungal infections, and psoriasis. The results emphasize the importance of comprehensive dermatological

assessment in elderly patients, as clinical presentations may be atypical or masked by coexisting age-related changes. The integration of dermatologic evaluation into routine geriatric care is essential for early diagnosis and effective management.

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