

# Skin Diseases Among Elderly Attending Out-patient Dermatologic Clinic, Siriraj Hospital

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## ABSTRACT

**Objective:** Elderly people have been increasing rapidly around the world. Skin diseases affect most elderly both physically and mentally. This study aimed to describe geriatric skin diseases related to age, gender, and seasonal differences.

**Methods:** The medical records of patients over 60 years of age attending the dermatologic clinic, Siriraj Hospital, Thailand in 2012 were randomly collected from each season. The data was analyzed according to sex, age and season.

**Results:** From 516 patients with the median age of  $70 \pm 7.6$  years, the five most frequent skin diseases were eczematous dermatitis 161 (31.2%), infection 113 (21.9%), tumor 62 (12%), psoriasis 43 (8.3%), and hair disorders 27 (5.2%). The most common eczema were xerotic eczema which was significantly seen more in winter compared with other seasons ( $p=0.029$ ). Trunk and legs were the significant areas of complaints. The infectious diseases were mostly fungus (15.1%), followed by virus (5.2%), bacteria (1.2%), and parasite (0.4%). Nail, soles and feet and intertriginous area were the significantly presented areas in the infectious group. The prevalence of benign and malignant neoplasms were 8.3% and 3.7%, respectively. The risk of developing neoplasm rose significantly with age. For older age, the complaint area was on the face, and a history of having other tumor were significant factors in the tumor group.

**Conclusion:** Skin diseases among the elderly should be more focused. Age, gender, season and area of complaint were important predisposing factors. Holistic approach and complete body examination were recommended.

**Keywords:** Elderly, skin diseases, prevalence, season

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## INTRODUCTION

The elderly population has been increasing steadily in many countries.<sup>1</sup> There was an expectation that from 2000 to 2050, the world population in this age group will more than triple from 600 million to 2 billion, especially in developing countries.<sup>2</sup> Approximately one-quarter

to one-third of dermatology visits were patients 65 years or older which will increase with age in many countries.<sup>3</sup> This longer life expectancy reflects the public health success of those countries including Thailand. However, aging is a degenerative process from both internal and external factors, leading to structural and functional changes and causes various diseases of many organ systems as well as skin diseases.<sup>1,4</sup> Skin disease affects most persons both physically and psychologically because it is often obvious to others.<sup>5</sup> Consequences of dermatoses not only suffer the patients but also sometimes make them

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embarrassed. Dermatologic diseases significantly affect patients' depression.<sup>6</sup> However, studies on prevalence of dermatologic diseases in geriatric patients is limited.<sup>1</sup>

Skin diseases affect almost half of elderly people.<sup>5</sup> A cross-sectional study in Iran found that the most common skin disease in this age group was benign neoplasm (65%), while the most common other skin disease was pruritus (22%).<sup>2</sup> The five most frequently encountered diseases in elderly patients from another study in Turkey were eczematous dermatitis, fungal infections, pruritus, and bacterial and viral infections.<sup>7</sup> In Thailand, a previous study from Thaipisuttikul Y., which focused on pruritic skin diseases in elderly, recruited the outpatients from November 1996 to January 1997 in a tertiary hospital and reported that pruritic skin disease was the most common problem, found in about 41% of elderly patients.<sup>8</sup>

The aim of this study was to determine the prevalence of geriatric skin diseases related to age, gender, and seasonal differences.

## MATERIALS AND METHODS

This study randomly collected the medical records of patients over 60 years of age attending the out-patient dermatology clinic, Siriraj Hospital, Thailand in 2012 from each season. The study was approved by the ethics committee of Siriraj Hospital, Mahidol University. History taking and clinical examination were done by dermatologists. A total of 450 patients were randomly selected from summer (February, March, April, May), rainy (June, July, August, September) and winter (October, November, December, January) seasons. The skin diseases were classified into 12 different categories, including senile purpura, eczematous dermatitis (xerotic eczema, seborrheic dermatitis, contact dermatitis, neurodermatitis, stasis dermatitis, and miscellaneous eczema), skin infection, pigmented disorders, blistering disorders, skin tumor, hair disorders, psoriasis, urticaria and others. Models were used to analyse the risk factors of the most presented diseases in elderly. Age, gender, season and area of complaint at the first presentation to the department were used for data analysis.

## Statistical analysis

The Student's t-test was used for the comparison of numerical data, and Chi-square test was used for categorical data. In addition to descriptive statistics, multivariate logistic regression models were used to analyse the risk factors of the most presented diseases in elderly. The analysis used data for age, gender, season, and area of complaint at the first presentation to the department. For analysis of the influence of age, this study used three strata (60-69, 70-79, >80 years). Subgroup analysis was conducted between male and female patients according to their cosmetic concerns which were graded by a physician. The p-value < 0.05 was considered statistically significant. All statistical data analyses were performed using SPSS for Windows version 15.0.

## RESULTS

Information from a total of 516 patients was collected. The age range of those was from 60 to 94 years, with the median age being 70±7.6 years. Of these, 217 (42.1%) were male and 299 (57.9%) were female. Overall, the five most common dermatologic diseases in these elderly patients were eczematous dermatitis 161 (31.2%), infection 113 (21.9%), tumor 62 (12%), psoriasis 43 (8.3%), and hair disorders 27 (5.2%). (Table 1)

In eczematous dermatitis group, female, winter, and complaint area of being on the leg showed significant differences from non-eczematous dermatitis group. (Table 2) Xerotic eczema was the most common type of eczematous dermatitis. Comparing with other types of dermatitis, trunk and legs were the significant area of complaints in xerotic eczema patients. (p < 0.001 and p = 0.004, respectively)

With regards to the infection, the infectious diseases encountered in decreasing order were fungus (15.1%), followed by virus (5.2%), bacteria (1.2%), and parasite (0.4%). The most frequent fungal infection was onychomycosis (44.9% of fungal infection), followed by paronychia. The most common viral disease was herpes zoster (44.4%), followed by wart (40.7%) and herpes simplex (14.8%), respectively. When comparing infectious (n=113) with non-infectious (n=403)

groups, nail, soles and feet, and intertriginous area were the significantly presented area in infectious group. (Table 3) Most of foot infections were

tinea pedis, followed by wart. In the same way, most of intertriginous infections were tinea cruris, followed by candida intertrigo.

**TABLE 1.** Skin diseases among elderly attending out-patient dermatologic clinic, Siriraj Hospital categorized by season

Diseases	Season*			Total
	Summer	Rainy season	Winter	
Eczematous dermatitis				161 (31.2%)
Xerotic eczema	15 (8.7%)	10 (5.8%)	28 (16.3%)	53 (10.3%)
Seborrheic dermatitis	6 (3.5%)	2 (1.2%)	7 (4.1%)	15 (2.9%)
Contact dermatitis	3 (1.7%)	2 (2.3%)	2 (1.2%)	9 (1.7%)
Neurodermatitis	3 (1.7%)	0 (0%)	1 (0.6%)	4 (0.8%)
Stasis dermatitis	2 (1.2%)	0 (0%)	1 (0.6%)	3 (0.6%)
Miscellaneous eczema	20 (11.6%)	27 (15.7%)	30 (17.4%)	77 (14.9%)
Infection	38 (22.1%)	46 (26.7%)	29 (16.9%)	113 (21.9%)
Tumor	29 (16.9%)	17 (9.9%)	16 (9.3%)	62 (12%)
Psoriasis	14 (8.1%)	13 (7.6%)	16 (9.3%)	43 (8.3%)
Hair disorders	8 (4.7%)	10 (5.8%)	9 (5.2%)	27 (5.2%)
Pigment disorders	8 (4.7%)	10 (5.8%)	8 (4.7%)	26 (5%)
Urticaria	7 (4.1%)	4 (2.3%)	8 (4.7%)	19 (3.7%)
Senile purpura	6 (3.5%)	4 (2.3%)	4 (2.3%)	14 (2.7%)
Blistering disorders	3 (1.7%)	3 (1.7%)	2 (1.2%)	8 (1.6%)
Others	10 (5.8%)	22 (12.8%)	11 (6.4%)	43 (8.3%)

\*Season: summer (February, March, April, May), rainy season (June, July, August, September) and winter (October, November, December, January)

**TABLE 2.** Factors correlated with eczema.

Factors	Univariate analysis			Multivariate analysis		
	Eczema (n=161), %	Non- eczema (n=355), %	p-value	Odds ratio	95% Confidence Interval	p-value
Age (Median, SD)	71.19±7.4	70.61±7.6	0.424	1.001	0.976-1.027	0.918
Female	80 (49.7%)	137 (38.6%)	0.018	1.548	1.043-2.295	0.03*
Season			0.007			
Summer	49 (30.4%)	123 (34.6%)		1.221	0.746-1.998	0.427
Rainy	43 (26.7%)	129 (36.3%)		1		
Winter	69 (42.9%)	103 (29%)		2.130	1.323-3.428	0.002*
Area of complaint						
Trunk	50 (31.1%)	105 (29.6%)	0.734			
Leg	38 (23.6%)	31 (8.7%)	<0.001	3.045	1.777-5.217	<0.001*
Arm	18 (11.2%)	28 (7.9%)	0.224			
Face	17 (10.6%)	66 (18.6%)	0.021	0.695	0.385-1.254	0.227
Underlying disease						
Atopy	15 (44.1%)	10 (62.5%)	0.225			
Diabetes mellitus	49 (30.4%)	120 (33.9%)	0.438			

\*Statistical significance;  $p \leq 0.05$

**TABLE 3.** Factors correlated with infection.

Factors	Univariate analysis			Multivariate analysis		
	Infection (n=113), %	Non-eczema (n=403), %	p-value	Odds ratio	95% Confidence Interval	p-value
Age (Median, SD)	71.4±7.4	70.6±7.7	0.379	1.006	0.968-1.045	0.773
Male	49 (43.3%)	168 (41.6%)	0.750	0.706	0.388-1.286	0.255
Season				0.086		
Summer	38 (33.6%)	134 (33.3%)		1.914	0.897-4.085	0.093
Rainy	46 (40.7%)	126 (31.3%)		2.002	0.949-4.224	0.068
Winter	29 (25.7%)	143 (35.5%)		1		
Area of complaint						
Nail	48 (42.5%)	1 (0.2%)	<0.001	506.305	66.949-3828.951	<0.001*
Intertriginous	14 (12.4%)	10 (2.5%)	<0.001	20.272	5.859-70.141	<0.001*
Soles & Feet	9 (8%)	4 (1%)	<0.001	12.792	5.298-30.885	<0.001*
Underlying diseases						
Diabetes mellitus	41 (36.3%)	128 (31.8%)	0.374			

\*Statistical significance;  $p \leq 0.05$

**TABLE 4.** Factors correlated with tumor.

Factors	Univariate analysis			Multivariate analysis		
	Tumor (n=62), %	Non-tumor (n=454), %	p-value	Odds ratio	95% Confidence Interval	p-value
Age (Median, SD)	74.5±8.1	70.3±7.4	<0.001	1.116	1.070-1.164	<0.001*
Male	19 (30.6%)	198 (43.6%)	0.052	0.541	0.273-1.069	0.077
Season			0.056			
Summer	29 (46.8%)	143 (31.5%)		1.065	0.471-2.407	0.879
Rainy	17 (27.4%)	155 (34.1%)		1.833	0.859-3.909	0.117
Winter	16 (25.8%)	156 (34.4%)		1		
Area of complaint						
Face	35 (56.5%)	48 (10.6%)	<0.001	14.35	7.28-28.289	<0.001*
Arm	8 (12.9%)	38 (8.4%)	0.24			
Underlying diseases						
Other tumor	10 (16.4%)	32 (7.2%)	0.015	2.491	1.049-5.920	0.039 *

\*Statistical significance;  $p \leq 0.05$

From overall patients, 8.3% of patients diagnosed with benign neoplasm and 3.7% diagnosed with malignant neoplasm. The most often seen tumor was seborrheic keratosis (50%). The frequency of basal cell carcinoma was 14.5%, actinic keratosis was 9.7%, and Bowen's disease was 8.1%. Compared to the youngest age group (60-69 years), the risk of developing neoplasm rose significantly within all the different age strata and was highest in the group of patients who were 80 years and older ( $p < 0.001$ ). Concerning the

identifiable factors of developing tumor, advanced age, complaint area being on the face and having other tumor were also significant factors in the tumor group. (Table 4)

Considering differences between males and females, males suffered with psoriasis more than females (11.5% and 6% respectively,  $p = 0.026$ ), while females came to hospital with pigment disorder more than male (7.7% and 1.4% respectively,  $p = 0.001$ ). Pigment disorder was concordant with the cosmetic concern which was found sig-

nificantly more in females (17.1%) than in males (5.1%) ( $p < 0.001$ ). Based on the area of complaint, females complained of the problem on the face significantly more than males (20.1% and 10.6% respectively,  $p = 0.004$ ), while males complained of the problem on the trunk significantly more than females (35.5% and 26.1%, respectively,  $p = 0.022$ ). In females, complaints about the trunk were significantly higher in older age than in younger age ( $p = 0.033$ ), whereas complaints about the face were significantly more in summer than in winter ( $p = 0.039$ ).

## DISCUSSION

The elderly population continues to increase each year globally as well as in Thailand. These rising numbers lead to an increase in skin disease prevalence.<sup>9</sup> Both external factors such as ultraviolet light and internal factors such as intrinsic degenerative and metabolic changes contribute dermatoses.<sup>1,3,9</sup> The immune system functions also decline considerably in the elderly.<sup>10</sup> Most of these skin diseases are not life-threatening, but affect the quality of life.<sup>1</sup> Treatment of skin diseases can improve overall quality of life and psychosocial livings in elderly.<sup>9</sup>

The frequency of eczematous dermatitis in this study was 161 patients (31.2%), which is in the range of dermatitis detected from other studies (16.3% to 58.7%).<sup>1</sup> From this study, xerotic eczema was the most frequent one and significantly occurred on legs which is one of the most common sites of xerosis.<sup>3</sup> Moreover, xerotic eczema seem to be found more in winter which is a common finding in previous studies.<sup>11,12</sup> The reason for this is that the dry skin in xerotic eczema is worsened by winter climatic conditions.<sup>13</sup>

The results demonstrated that infection was the second most common skin disease in the elderly, especially fungal infection which is among the most common dermatologic diseases in elderly populations worldwide.<sup>3</sup> In the elderly, the epidermis becomes thinner and tears easily particularly by scratching, allowing microorganisms to enter broken skin.<sup>1,9</sup> Nails also thin and undergo a slow decline in growth rate and increase in incidence of onychomycosis as people age.<sup>14-16</sup> That may be

the reason that around one fifth of subjects in this study had onychomycosis. A study found that the frequency of onychomycosis was approximately 10.4% in patients over 65 years old.<sup>1</sup> Besides, this study showed that intertriginous areas and feet were also the prone areas for infection. Previous study observed that intertriginous infections and onychomycosis are cutaneous infections that occur more commonly in the elderly and most of the intertriginous infection was cutaneous candidiasis which usually develops at groins, perineal area, axilla, and inframammary areas.<sup>10</sup> If these skin mycoses are left untreated, it can progress and can result in serious complications, especially those on the feet. Previous study reported that the cutaneous fungal infection on the feet including tinea pedis and onychomycosis can cause acute bacterial cellulitis of the leg.<sup>17</sup> A recent epidemiological study reported that tinea unguium or tinea pedis affected almost 10% of elderly.<sup>18</sup> There is an approximation that for every 1 year of advancing age, the risk of fungal infection increases by 10%. This may be explained by the changes in human innate and acquired (adaptive) immunity along with age. Moreover, turnover rate of keratinocyte tends to decrease with aging and prevents desquamation of skin infected by fungus.<sup>3</sup> The second most common infection in elderly from several studies was viral infection which was the same as this study.<sup>1</sup> Of the viral infections, as seen in this study, previous studies have demonstrated that herpes zoster was the most commonly seen, followed by warts.<sup>1,7</sup> In one study, the prevalence of skin infection was as follows: herpes zoster (78.4%), warts (16.4%) and herpes simplex infections (4%),<sup>19</sup> and were 52.1%, 33.8%, and 13.9%, respectively in another.<sup>20</sup> The varicella zoster virus is frequently reactivated due to the waning humoral cellular immunity in elderly and usually causes herpes zoster infection.<sup>1,3</sup>

The prevalence of skin tumor in this study significantly increased with age. Generally, the risk of developing skin cancers is associated with aging.<sup>1</sup> The increased incidence of neoplasm in aging is related to several factors, including human innate and acquired (adaptive) immunity, decreased DNA-repair capacity, and carcinogenic material accumulation.<sup>1,3</sup> Another important etiologic factor



is sunlight exposure which is longer in elderly than in younger people. The prevalence of neoplasms in this study were in the range of many previous studies which vary from 1.7% to 13.8% in benign and 2.1% to 12.6% in malignant neoplasms.<sup>1</sup> The most common tumor seen in this study was seborrheic keratosis, which was similar to a recent study in Brazil (46.6%). Seborrheic keratosis is very common in patients aged over 50 years, which can be observed in almost 80-100%. There is a proposed etiology of seborrheic keratosis that exposure to sunlight plays a role in its development. The prevalence of seborrheic keratosis considerably increases with age. It significantly presents more on exposed areas, especially on the face. It is a major tumor problem in Thailand and Korea.<sup>21</sup>

## CONCLUSION

Skin diseases among the elderly should be more focused. Age, gender, season and area of complaint were important predisposing factors. Holistic approach and complete body examination are recommended.

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