

Allergic Skin Disease in Elderly at Dr. Soetomo General Academic Hospital Surabaya (2019-2021)

Aulia Anisa Putri¹, Damayanti², Raden Argarini³, Trisniartami Setyaningrum²

¹Medical Program, Faculty of Medicine, Universitas Airlangga, Surabaya, Indonesia

²Department of Dermatology and Venereology Faculty of Medicine, Universitas Airlangga/Dr. Soetomo General Academic Hospital, Surabaya, Indonesia

³Department of Physiology and Medical Biochemistry, Faculty of Medicine, Universitas Airlangga, Surabaya, Indonesia

*Corresponding author: damayanti@fk.unair.ac.id

Abstract

Introduction: The risk of allergic skin disease caused by changes in the skin structure the of elderly should be the main focus due to concerns about decreasing quality of life and the emergence of physical and mental weaknesses. The aim of this study was to evaluate the profile of allergic skin diseases in elderly at the Dermatology and Venereology outpatient unit of Dr. Soetomo General Academic Hospital Surabaya throughout the year 2019-2021. **Methods:** This retrospective descriptive study was conducted using a total sampling technique in which 147 elderly patients met the inclusion and exclusion criteria. The variables observed and recorded were then processed using SPSS Version 25 and Microsoft Excel to obtain the results. **Results:** More than half of the sample were female (64,6%) and most were aged 55-65 years (51,7%). Most of the patients' occupations were housewives (41,5%). The education background of the majority is high school (46,9%) with the most domicile in Surabaya (70,1%). The chief complaint that most felt was itching (91,2%) with most precipitating factors being allergens and irritants (61,9%) and no comorbidities were found in the majority (55,1%). The duration of complaints ranged from less than one year (90,5%) with normal BMI (62,6%) dominating the sample. The most common form of efflorescence is erythematous macules (73,5%) and localized in the manus (27,9%). Contact dermatitis was the most common diagnosis in this study (61,2%) with combination therapy (73,5%) using oral antihistamines (83,7%) and topical corticosteroids (72,1%). **Conclusion:** Allergic skin disease with disturbing itching complaints is still a health problem that needs attention in elderly.

Keywords: skin disease, allergic, elderly, human and disease, sensitive skin

1. Introduction

The elderly group is a subpopulation that is considered to be increasing and is expected to reach a figure of around 25 of the total population in industrialized countries by 2040 [6]. In the literature, there are few reports that all aspects will affect this subpopulation group, especially in the health sector, one of which is an allergic disease which is expected to increase by around 5-10 [3]. Allergic disease is often associated with the age group that is considered by society, that allergies only appear in childhood. However, this disease often continues into a more mature age and even into old age and does not rule out the first appearance in older people. The sub-classification of people with old age is an important thing to pay attention to, such as by taking into account the quality of life, increased physical and psychological weakness of the person, comorbidities, and dependence on several drugs that have been previously prescribed by the medical personnel assigned to treat these patients [6]. One of the allergic skin diseases that may attack or appear in elderly patients is dermatitis. This disease is divided into several subsections based on clinical manifestations, such as atopic dermatitis, seborrheic dermatitis, contact dermatitis, exfoliative dermatitis, and dyshidrotic dermatitis whose incidence rates are currently increasing. Cases of this dermatitis usually appear for the first time in adolescence and young adulthood. Previous studies considered that the clinical manifestations of patients with atopic dermatitis in adults generally disappear with age until they reach their 50s. Accordingly, atopic dermatitis is usually classified based on patient age and typical skin characteristics or the appearance of

lesions into three types: infantile type 2 years of age, childhood 2-12 years of age, and adolescents or adults 12 years of age, but not more than half. However, the paradigm has recently changed, and the number of cases of atopic dermatitis in adults has increased, even at 60 years old. Therefore, this study aims to retrospectively evaluate the profile of allergic skin diseases in elderly at the Dermatology and Venereology Outpatient Unit at Dr. Soetomo General Academic Hospital Surabaya in 2019-2021.

2. Method

This study was based on observational research and is a quantitative correlational study with a descriptive retrospective method. Data were obtained from patients' medical records on the database of the hospital. The samples were collected from all the elderly patients who are more than 50 years old with allergic skin diseases at the Dermatology and Venereology outpatient unit at Dr. Soetomo General Academic Hospital Surabaya. A total sampling technique was used in this study so that all the patients who met the inclusion and exclusion criteria were considered samples. The inclusion criteria of this study are the patients with allergic skin diseases in Dermatology and Dermatology outpatient unit at Dr. Soetomo General Academic Hospital Surabaya in 2019-2021 who are 50 years and over with complete medical records. However, patients that have incomplete medical records were excluded from this study.

Demographic information was collected on the patients' age, gender, domicile, occupation, and education. Other than that, in order to handle the data more efficiently, all medical records containing chief complaints, trigger factors, comorbidities, duration of time they were ill, clinical manifestation, the location of clinical manifestation appearance, and nutritional status, were calculated using Body Mass Index (BMI), diagnosis, and therapy or medications were collected and recorded. This research was approved by the Health Research Ethics Committee of Dr. Soetomo General Academic Hospital Surabaya with reference number 1038/LOE/301.4.2/IX/2022.

The data obtained were collected with Microsoft Excel and then statistically analyzed by SPSS Version 25, then presented as a frequency table with the percentage of all variables, which was then converted into a descriptive form.

3. Result

A. Sociodemographic Characteristics

During 3 years period, a total of 32,226 patients were seen at the Dermatology and Venereology Outpatient Unit at the Dr. Soetomo General Academic Hospital Surabaya, and the number of patients aged more than 50 years during that period was 9063 patients and patients aged more than 50 years who were recorded as having allergic skin disease were 179 patients. We also found that the incidence of allergic skin disease in the Dermatology and Venereology Outpatient Unit at the Dr. Soetomo General Academic Hospital Surabaya in the 2019-2021 period was 1.97% of the cases. In 2019, patients in the Dermatology and Venereology Outpatient Unit at Dr. Soetomo General Academic Hospital Surabaya have as many as 72 people, followed by 45 patients in 2020 and 30 patients in 2021. The remaining 32 patients were excluded from the sample because they have incomplete medical records. It is shown that there was a trend for dermatological patient numbers to be strikingly decreased every year, this is caused by the pandemic COVID-19 situation we have been through during those years. A total of 147 elderly patients who met the inclusion criteria were included with sociodemographic characteristics, as shown in Table 1. Within a period of three years, females accounted to be higher in percentage than males (64.6%), with the most frequent age ranging from 55-65 years (51.7%), and were residing in Surabaya (70.1%). Based on educational and occupational backgrounds, most patients were high school graduates (46.9%) and worked as housewives (41.5%).

Table 1. Sociodemographic characteristics of the patients (n=147)

Sociodemographic characteristics	Year (%)			Total (%)
	2019	2020	2021	
Gender				
Male	21 (29.2)	18 (40)	13 (43.3)	52 (35.4)
Female	51 (70.8)	27 (60)	17 (56.7)	95 (64.6)
Age (years)				
50-54	20 (27.8)	8 (17.8)	6 (20)	34 (23.1)
55-65	36 (50)	24 (53.3)	16 (53.3)	76 (51.7)
66-74	11 (15.3)	10 (22.2)	7 (23.3)	28 (19)
75-90	5 (6.9)	3 (6.7)	1 (3.3)	9 (6.1)
>90	0 (0)	0 (0)	0 (0)	0 (0)
Domicile				
Surabaya	54 (75)	26 (57.8)	23 (76.7)	103 (70.1)
Sidoarjo	5 (6.9)	6 (13.3)	1 (3.3)	12 (8.2)
Lamongan	4 (5.6)	1 (2.2)	1 (3.3)	6 (4.1)
Others	9 (12.5)	12 (26.7)	5 (16.7)	26 (17.7)
Educational background				
Elementary school	14 (19.4)	6 (13.3)	7 (23.3)	27 (18.4)
Junior High school	14 (19.4)	8 (17.8)	2 (6.7)	24 (16.3)
Senior High school	33 (45.8)	20 (44.4)	16 (53.3)	69 (46.9)
Diploma	1 (1.4)	4 (8.9)	1 (3.3)	6 (4.1)
Bachelor	6 (8.3)	4 (8.9)	2 (6.7)	12 (8.2)
Magister	1 (1.4)	0 (0)	1 (3.3)	2 (1.4)
Others	3 (4.2)	3 (6.7)	1 (3.3)	7 (4.8)
Occupation				
Housewives	37 (51.4)	11 (24.4)	13 (43.3)	61 (41.5)
Private employees	18 (25)	10 (22.2)	6 (20)	34 (23.1)
Government employees	3 (4.2)	6 (13.3)	2 (6.7)	11 (7.5)
Farmer	3 (4.2)	2 (4.4)	2 (6.7)	7 (4.8)
Entrepreneur	2 (2.8)	1 (2.2)	2 (6.7)	5 (3.4)
Unemployed	2 (2.8)	2 (4.4)	0 (0)	4 (2.7)
Teacher	1 (1.4)	1 (2.2)	0 (0)	2 (1.4)
Others	6 (8.3)	12 (26.7)	5 (16.7)	23 (15.6)

B. Anamnesis

The most common chief complaints of the patients are itching (91.2%), followed by the appearance of rashes on the skin in as many as 107 patients (72.8%) are detailed in Table 2. Most elderly patients with

allergic skin disease reportedly have been feeling the complaints for less than a year, with 133 patients (90.5%) and at least a range of 3-4 years with a total of 3 patients (2%) and none were exceeding more than 4 years. Upon categorization of the comorbidities, 81 patients (55.1%) were recorded as having no comorbid, while the least 2 patients (1.4%) have a history of asthma. For the criteria of our organized precipitating factors group, the most common substance was allergens or irritants, which involves detergents, soaps, cosmetics, embrocation oils, flip-flops, and others in 91 patients (61.9%). Drugs can also trigger allergies in as many as 52 patients (35.4%), such as paracetamol, cefadroxil, ciprofloxacin, amoxicillin, penicillin, and others. Food groups were reported to trigger allergies in 25 patients (17%) with several types of categories, including chicken, eggs, shrimp, fish, chocolate, and others, while the most negligible percentage for 8 patients (5.4%) was from environmental conditions, covering dust, water, air, and pets fur. In this variable, each patient may have more than one chief complaint.

Table 2. Anamnesis of the patients (n=147)

Anamnesis	Year (%)			Total (%)
	2019	2020	2021	
Chief Complaints*				
Itch	70 (97.2)	37 (82.2)	27 (90)	134 (91.2)
Rash	50 (69.4)	34 (75.6)	23 (76.7)	107 (72.8)
Burning sensation	12 (16.7)	10 (22.2)	5 (16.7)	27 (18.4)
Hyperpigmentation	7 (9.7)	5 (11.1)	2 (6.7)	14 (9.5)
Duration of the Sickness				
<1 year	66 (91.7)	41 (91.1)	26 (86.7)	133 (90.5)
1-2 years	3 (4.2)	4 (8.9)	4 (13.3)	11 (7.5)
3-4 years	3 (4.2)	0 (0)	0 (0)	3 (2)
>4 years	0 (0)	0 (0)	0 (0)	0 (0)
Comorbid Factors*				
Hypertension	33 (45.8)	17 (37.8)	6 (20)	56 (38.1)
Diabetes Mellitus	3 (4.2)	10 (22.2)	3 (10)	16 (10.9)
Asthma	1 (1.4)	1 (2.2)	0 (0)	2 (1.4)
No comorbidity	37 (51.4)	22 (48.9)	22 (73.3)	81 (55.1)
Precipitating Factors*				
Allergen and irritant substances	40 (55.6)	33 (73.3)	18 (60)	91 (61.9)
Drugs	25 (34.7)	17 (37.8)	10 (33.3)	52 (35.4)
Foods	10 (13.9)	10 (22.2)	5 (16.7)	25 (17)
Environment	4 (5.6)	3 (6.7)	1 (3.3)	8 (5.4)

*One subject can have more than one chief complaint, comorbid factors, and trigger factors

C. Nutritional Status (BMI)

The calculation of the nutritional status was carried out based on BMI analysis using the patient's height and weight, detailed in Table 3. A total of 92 patients (62.6%) were categorized as average, and the least 6 patients (4.1%) were classified as obese.

Table 3. Nutritional status (BMI) of the patients (n=147)

Nutritional Status (BMI)	Year (%)			Total (%)
	2019	2020	2021	
Underweight	11 (15.3)	5 (11.1)	2 (6.7)	18 (12.2)
Normal	41 (56.9)	28 (62.2)	23 (76.7)	92 (62.6)
Overweight	16 (22.2)	11 (24.4)	4 (13.3)	31 (21.2)
Obese	4 (5.6)	1 (2.2)	1 (3.3)	6 (4.1)
	72 (100)	45 (100)	30 (100)	147 (100)

D. Physical Examination

Distribution of the efflorescence's location mostly appeared on the hand of 41 patients (27.9%), followed by the one which was generalized all over the body and superior extremities including the upper arm to the wrist of 32 patients (21.8%), while the least 8 patients (5.4%) efflorescence was found in the abdominal. Other locations were reported to be in the maxilla, orbital and supraorbital, nasal and perinasal, areola, labium, auricle, coli, labia oris, glans penis, scalp, capitis, and gluteus regions with erythematous macules as the most common manifestations in 108 patients (73.5%), and followed by scales in 65 patients (44.2%). The appearance of blisters on the skin was found only in 1 patient (0.7%). Other groups of efflorescences were seen in the patients' study including purpura, excoriations, hyperkeratosis, morbilliform, pustules, ulcers, and discharge. (Table 4)

Table 4. Physical examination of the patients (n=147)

Physical Examination	Year (%)			Total (%)
	2019	2020	2021	
Area of The Lesion*				
Manus	24 (33.3)	13 (28.9)	4 (13.3)	41 (27.9)
Generalized	18 (25)	7 (15.6)	7 (23.3)	32 (21.8)
Superior extremities	13 (18.1)	12 (26.7)	7 (23.3)	32 (21.8)
Facialis	14 (19.4)	8 (17.8)	8 (26.7)	30 (20.4)
Inferior extremities	13 (18.1)	3 (6.7)	9 (30)	25 (17)
Thoracalis	8 (11.1)	5 (11.1)	9 (30)	22 (15)
Pedis	10 (13.9)	8 (17.8)	8 (26.7)	20 (13.6)
Abdomen	4 (5.6)	2 (4.4)	2 (6.7)	8 (5.4)
Others	1 (1.4)	8 (17.8)	3 (10)	13 (8.2)
Efflorescence*				
Erythematous macules	51 (70.8)	30 (66.7)	27 (90)	108 (73.5)
Scales	35 (48.6)	16 (35.6)	14 (46.7)	65 (44.2)
Hyperpigmentation macules	18 (25)	17 (37.8)	8 (26.7)	43 (29.3)
Continued...				

Continued...

Physical Examination	Year (%)			Total (%)
	2019	2020	2021	
Efflorescence*				
Erosion	13 (18.1)	14 (31.1)	7 (23.3)	34 (23.1)
Xerosis	14 (19.4)	5 (11.1)	9 (30)	28 (19)
Crust	8 (11.1)	9 (20)	1 (3.3)	18 (12.2)
Papules	8 (11.1)	6 (13.3)	1 (3.3)	15 (10.2)
Fissures	9 (12.5)	2 (4.4)	2 (6.7)	13 (8.8)
Lichenification	4 (5.6)	4 (8.9)	4 (13.3)	12 (8.2)
Oedema	4 (5.6)	2 (4.4)	2 (6.7)	8 (5.4)
Exudate	1 (1.4)	1 (2.2)	0 (0)	2 (1.4)
Blisters	0 (0)	1 (2.2)	0 (0)	1 (0.7)
Others	16 (22.2)	8 (17.8)	2 (6.7)	26 (17.7)

*One subject can have more than one efflorescence and area of the lesion

E. Diagnosis

According to the diseases that were shown in Table 5, the most frequent diagnosis we found was contact dermatitis in 90 patients (61.2), followed by drug eruption in 33 patients (22.4). Atopic dermatitis was ranked third as the most common diagnosis in this study in as many as 16 patients (10.9), dyshidrotic dermatitis in 5 patients (3.4), and exfoliative dermatitis in 3 patients (2).

Table 5. Diagnosis of the patients (n=147)

Diagnosis	Year (%)			Total (%)
	2019	2020	2021	
Contact Dermatitis	39 (54.2)	34 (75.6)	17 (56.7)	90 (61.2)
Drug Eruption	21 (29.2)	6 (13.3)	6 (20)	33 (22.4)
Atopic Dermatitis	9 (12.5)	4 (8.9)	3 (10)	16 (10.9)
Dyshidrotic Dermatitis	3 (4.2)	1 (2.2)	1 (3.3)	5 (3.4)
Exfoliative Dermatitis	0 (0)	0 (0)	3 (10)	3 (2)
	72 (100)	45 (100)	30 (100)	147 (100)

F. Therapy

In the total number of samples in this study, we found that most of the samples received both types of therapy, a combination of systemic and topical, reported to be 108 patients (73.5) which was detailed in Table 6. Patients who only received systemic therapy were 24 (16.3), and patients who only received topical treatment were 15 (10.2). It shows that the most widely administered systemic therapy was antihistamines such as cetirizine and dexamethasone for 123 patients (83.7), while corticosteroid was the most administered topical therapy to 106 patients (72.1).

Table 6. Therapy of the patients (n=147)

Therapy	Year (%)			Total (%)
	2019	2020	2021	
Systemic Therapy				
Antihistamine				123 (83.7)
Cetirizine	48 (90.6)	35 (87.5)	29 (96.7)	112 (76.2)
Loratadine	3 (5.7)	5 (12.5)	1 (3.3)	9 (6.1)
Chlorepniramine maleate (CTM)	2 (3.8)	0 (0)	0 (0)	2 (1.4)
Corticosteroids				54 (36.7)
Dexamethasone	25 (86.2)	11 (91.7)	12 (92.3)	48 (32.7)
Methylprednisolone	3 (10.3)	1 (8.3)	1 (7.7)	5 (3.4)
Prednisone	1 (3.4)	0 (0)	0 (0)	1 (0.7)
Antibiotic				6 (4.1)
Erythromycin	3 (80)	0 (0)	0 (0)	4 (2.7)
Amoxycillin	1 (20)	1 (100)	0 (0)	2 (1.4)
Analgesic				1 (0.7)
Paracetamol	1 (100)	0 (0)	0 (0)	1 (0.7)
Antidepressant tricyclic				1 (0.7)
Amitriptyline	0 (0)	0 (0)	1 (100)	1 (0.7)
Vitamin B1				2 (1.4)
Thiamine	1 (100)	0 (0)	0 (0)	2 (1.4)
Kolagoga				1 (0.7)
Ursodeoxysolate	1 (100)	0 (0)	0 (0)	1 (0.7)
Topical Therapy				
Corticosteroids				106 (72.1)
Mometasone furoate	23 (46.9)	18 (56.3)	9 (33.3)	50 (34)
Desoximetasone	22 (44.9)	12 (37.5)	13 (48.2)	47 (32)
Hydrocortisone	4 (8.2)	2 (6.3)	5 (18.5)	9 (6.1)
Antibiotic				45 (30.6)
Sodium fusidate	15 (83.3)	16 (84.2)	7 (87.5)	38 (35.9)
Fucilex	3 (16.7)	3 (15.8)	1 (12.5)	7 (4.8)
Anti-fungal				4 (2.7)
Ketoconazole	0 (0)	4 (100)	0 (0)	4 (2.7)
Moisturizer				58 (39.5)
Atopiclair	6 (40)	20 (76.9)	12 (70.6)	38 (25.9)
Urea	5 (33.3)	2 (7.7)	1 (5.9)	8 (5.4)
Vaseline album	3 (20)	2 (7.7)	1 (5.9)	6 (4.1)

Continued...

Biocream	0 (0)	2 (7.7)	3 (17.6)	5 (2.2)
Soft U Derm	1 (6.7)	0 (0)	0 (0)	1 (0.7)
Others				9 (6.1)
NS 500ml	1 (50)	6 (100)	0 (0)	7 (4.8)
Vitamin and mineral combination ferro sulf	1 (50)	0 (0)	1 (100)	2 (1.4)

4. Discussion

This study used secondary data from medical records at the Outpatient Unit of Dermatology and Venereology of Dr. Soetomo General Academic Hospital Surabaya, with a total sample of 147 elderly patients with allergic skin diseases in 2019-2021. We found a significant difference in the number of patients per year, which we suspected was decreased as a cause of the pandemic COVID-19 during those years. The total number of outpatients for three years covering 2019-2021 was recorded as 32,226 patients, with 9063 patients aged more than 50 years old. The number of patients aged more than 50 years old who were recorded as having allergic skin disease was 179 patients and it showed that the incidence of allergic skin disease in the Outpatient Unit of Skin and Genital of Dr. Soetomo General Academic Hospital Surabaya in 2019-2021 is 1.97% of the cases.

The highest prevalence of allergic skin disease was found in the female group, which was reported in 95 patients (64.6%), compared to the male group, which only amounted to 52 patients (35.4%). Studies conducted in Manado, Germany, and Surabaya also discovered that allergic skin diseases are more common in women [10, 11, 27]. The reason it appears frequently in women could be the differences in skin structure between the two sexes; in men, it found that the hormone androgens are much more than in women which caused it to be more prone and more susceptible to damage, especially with the high frequency of exposure to irritants [1]. As for the hygiene hypothesis theory, it says that there are several relationships between gender and the level of exposure that might be obtained. In this case, women are more at risk of suffering from allergies, asthma, and auto-immune diseases than men because the level of cleanliness in women is reported to be higher, thereby increasing the risk of allergies, which is inversely proportional to the reduced risk of infection [4].

Skin degeneration, which is directly proportional to age, causes a loss of skin elasticity in older people so that they become more sensitive and dry then impacts their susceptibility to infection by specific allergens or irritants [1]. We found that the highest distribution of allergic skin disease in the elderly is in the age range of 55-65 years in 76 patients (51.7%). This age group can still be categorized as an elderly group at an early stage in accordance with research conducted in Iran and China [5, 28]. However, this result is certainly not a determinant or a benchmark because, in the older age group, it is also possible to have allergic skin disease [9].

The most domicile distribution of allergic skin disease patients was in Surabaya, with 103 patients (70.1%). It is expected because this research was conducted in Surabaya, specifically at Regional General Hospital Dr. Soetomo Surabaya, which caused most of the recorded samples to reside in Surabaya, thus allowing for the uneven distribution of domiciles for all samples. In addition, patients with Surabaya domiciles will undoubtedly find it easier to reach related health facilities because the distance is quite close.

High school graduates dominated the most which amounted to 69 patients (64.9%), followed by elementary school graduates with 27 patients (18.4%). A study conducted in Brazil reported that the largest group was the junior high school graduate group followed by the high school graduate group. It is estimated to have a correlation or relationship with the type of work that is owned by all research samples, such as cleaning services, construction workers, and other jobs that have a low level of acceptance qualifications so

that people with junior high school graduates fill more of these opportunities which result in an increased incidence of allergic skin disease on them [1].

Some activities require people to get more frequent exposure to various allergens and irritants that can risk their skin to be more susceptible to allergic skin diseases, especially housewives [27]. As the final outcome, the proportion of admitted patients in our study for allergic skin diseases is housewives reported as 61 patients (41.5%). Also, research conducted in Surabaya, Manado, and Iran reported that the largest group was housewives [5, 10, 27].

In the current study (91.2%), as in other studies in Tanzania and Brazil, Russia, China, America, and France, itching was the most frequent chief complaint of the diseases [18, 24]. The cause of itching has a relationship with aging which results in sebum production decreases, and in female patients, this occurs with the onset of menopause, implying a reduced role of estrogen. Expression of aquaporins which are integral in the maintenance of epidermal water content has been shown to decrease aging skin leading to drier skin or is often referred to as xerosis, which usually appears as itching, cracking, and peeling, often on the extremities and trunk. The scratching response causes further disruption of the barrier contributing to the overlapping risk of infection, and continuation of the itch-scratch cycle can lead to further inflammation and exacerbate chronic itching [7].

Most of the study samples reported the absence of several comorbidities accompanying the primary diagnosis, namely 81 patients (55.1%). Another 56 patients (38.1%) reported having a history of hypertension. Later, These results were supported by a study conducted in America stating an indirect correlation between allergic skin disease and hypertension. Side effects that may be felt by patients with allergic skin diseases, such as excessive anxiety that triggers symptoms of depression, will slowly lead to high blood pressure in patients, thereby increasing the risk of cardiovascular disease [26].

The high prevalence of allergens and irritants (61.9%) as precipitating factors can be explained by the habits of doing contact with various agents such as vegetables, soaps, detergents, and the presence of rubbing trauma. Repeated exposure to various triggering agents during daily household chores, including cooking, washing, cleaning, or even feeding animals can also be one of the reasons why housewives have the highest prevalence of these cases [1]. Exposure to chemicals in the long term will certainly cause an increase in transepidermal water loss which then leads to dryness of the skin and loss of skin barrier function and results in vulnerability to irritation [10].

This study's highest range of illness duration in allergic skin diseases was under a year, with 133 patients (90.5%). This case is related to age, and this study was dominated by patients aged 55-65 years who were still in the early stages of old age, so the complaints they felt were thought to be recent or even persistent. Differences in reaction patterns in each individual are a determining factor for the length of time the patient feels ongoing symptoms [12]. It was later proven by a study in Costa Rica which reported that the clinical course of the disease period was in the range of one to three years with an average of fewer than 6 months [25]. A study in Tunisia also reported that the mean duration of development of clinical manifestations in patients with skin diseases ranged from 8 to 75 months [13].

In this study, the measurement of nutritional status was based on BMI, which resulted in the majority being normal in 92 patients (62.6%). These results were then supported by studies conducted in Surabaya and England which reported that the BMI of most allergic skin disease patients was normal [2, 22]. Secondary analysis of these results finally reported that there was no relationship or association between the nutritional status of a patient based on BMI and the risk of allergic skin disease, the primary mechanism of which was unclear [2].

Significant formation of efflorescence was observed in this study, with the type IV hypersensitivity skin reaction mechanism, which is mediated by inflammatory cytokines but in older people, activating this regulation is less efficient in regulating the inflammatory response and resulting in the formation of

erythematous in the skin, it was being explained why erythematous is more frequent in this study (73.5%) [6]. Other studies conducted in Surabaya and China also reported the exact result [10, 23, 28].

Hands generally are used in every activity in life, moreover when the job requires them to get long-term exposure to any allergens and irritants, such as housewives [17]. Studies conducted in Hungary, China, and Brazil reported that hands are the most frequent area where efflorescence could appear, and it also occurred in this present study (27.9%) [17, 19, 28].

Inequalities will always be present in various kinds of allergic skin diseases, and in the current studies (61.2%) as in other studies in Taiwan, Japan, and China, a high incidence of dermatitis contact can be caused by impaired epidermal barrier function and a history of long-term exposure to various potential irritants or allergens that can increase susceptibility with age [8, 14, 21, 28]. As a result of intrinsic and extrinsic factors, changes begin to occur with the clinical characteristics of dry, inflexible, prone skin and inadequate wound healing [19]. Changes in this tissue structure then influence individuals to develop skin diseases such as contact dermatitis, which require therapy to regenerate the skin barrier to prevent infection and other skin diseases [15].

Combination therapy is the common finding for 108 patients (73.5%) in this study based on the management of allergic skin diseases written in the Clinical Practice Guide for Dermatologists and Venereologists in Indonesia, with the antihistamine class as the most systemic therapy (83.7%), and the corticosteroid class as the most topical therapy (72.1%), which is similar with studies conducted in Surabaya and Manado [10, 20, 23, 27, 29]. Administration of antihistamine group therapy serves to reduce the itching sensation felt by the patient. In contrast, topical treatment of the corticosteroid class applied to local lesions reduces inflammation [10].

5. Conclusion

During the observation period of 3 years from 2019 to 2021, the number of patient visits decreased due to the COVID-19 pandemic. A total of 147 elderly patients had been found to have allergic skin diseases and were being treated at Dr. Soetomo General Academic Hospital Surabaya with an incidence rate reaching 1.97% of the cases. Most of them are women aged between 54-65 and live in Surabaya as housewives with educational backgrounds in high school. Most respondents complained of getting itch because of the allergen and irritant. They were also ill for less than a year without comorbidities, and their nutritional status was normal. Besides, the clinical manifestation that usually appears is erythematous macules in the region manus. Medications that were given to the patients were mostly combined between systemic, which is an oral antihistamine, and topical, which is a corticosteroid.

Acknowledgments

The authors would like to thank the Outpatient Unit of Dermatology and Venereology Dr. Soetomo General Academic Hospital, Indonesia for providing the patient's data. We would also like to deeply thank our family and loved ones for their love, tenderness, and concern throughout the time and when we forgot to take a break for ourselves in the making of this research.

References

- [1] Ade Indrawan I, Suwondo A, Lestantyo D. Faktor-Faktor Yang Berhubungan Dengan Kejadian Dermatitis Kontak Iritan Pada Pekerja Bagian Premix Di PT. X Cirebon. *Jurnal Kesehatan Masyarakat (Undip)*. 2014 Sep 11;2(2):110–8.

- [2] Ascott A, Mansfield KE, Schonmann Y, Mulick A, Abuabara K, Roberts A, et al. Atopic eczema and obesity: a population-based study*. *British Journal of Dermatology*. 2020 Dec;184(5):871–9.
- [3] Cardona V, Guilarte M, Luengo O, Labrador-Horrillo M, Sala-Cunill A, Garriga T. Allergic diseases in the elderly. *Clinical and Translational Allergy*. 2011 Jan;1(1):11.
- [4] Clough S. Gender and the hygiene hypothesis. *Social Science & Medicine*. 2011 Feb;72(4):486–93.
- [5] Darjani A, Mohtasham-Amiri Z, Mohammad Amini K, Golchai J, Sadre-Eshkevari S, Alizade N. Skin Disorders among Elder Patients in a Referral Center in Northern Iran (2011). *Dermatology Research and Practice*. 2013;2013:1–4.
- [6] De Martinis M, Sirufo MM, Ginaldi L. Allergy and Aging: An Old/New Emerging Health Issue. *Aging and Disease*. 2017 Apr 1;8(2):162–75.
- [7] Fourzali KM, Yosipovitch G. Management of Itch in the Elderly: A Review. *Dermatology and Therapy*. 2019 Sep 23;9(4):639–53.
- [8] FURUE M, YAMAZAKI S, JIMBOW K, TSUCHIDA T, AMAGAI M, TANAKA T, et al. Prevalence of dermatological disorders in Japan: A nationwide, cross-sectional, seasonal, multicenter, hospital-based study. *The Journal of Dermatology*. 2011 Mar 22;38(4):310–20.
- [9] Garibyan L, Chiou AS, Elmariah SB. Advanced aging skin and itch: addressing an unmet need. *Dermatologic Therapy*. 2013 Mar;26(2):92–103.
- [10] Ginting E, Damayanti D, Fetarayani D, Hidayati AN. Contact Dermatitis in Tertiary Hospital: A 2-year Retrospective Study. *BIKK*. 2021 Jul. 31;33(2):88-92
- [11] Hahnel E, Blume-Peytavi U, Trojahn C, Dobos G, Jahnke I, Kanti V, et al. Prevalence and associated factors of skin diseases in aged nursing home residents: a multicentre prevalence study. *BMJ Open*. 2017 Sep;7(9):e018283.
- [12] Jacob S, Elsaie M, Castaneda-Tardan M, Stechschulte S, Kaufman J. Aging and Contact Dermatitis: A Review. *Current Aging Science*. 2009 Jul 1;2(2):121–6.
- [13] Kalboussi H, Kacem I, Aroui H, El Maalel O, Maoua M, Brahem A, et al. Impact of Allergic Contact Dermatitis on the Quality of Life and Work Productivity. *Dermatology Research and Practice*. 2019 Mar 3;2019:1–8.
- [14] Liao Y, Chen KF, Tseng MP, Sun CP. Pattern of Skin Diseases in a Geriatric Patient Group in Taiwan: A 7-Year Survey from the Outpatient Clinic of a University Medical Center. *Dermatology*. 2001 Jul 1;203(4):308–13.
- [15] Lima AL, Timmermann V, Illing T, Elsner P. Contact Dermatitis in the Elderly: Predisposing Factors, Diagnosis, and Management. *Drugs & Aging*. 2019 Apr 29;36(5):411–7.
- [16] Malhotra V, Dogra A, Gupta SK, Kaur S. A study of profile of contact dermatitis in housewives with reference to vegetables, soaps and detergents. *International Journal of Research in Dermatology*. 2018 Jul 24;4(3):332.
- [17] Melo M das GM, Villarinho ALCF, Leite I da C. Sociodemographic and clinical profile of patients with occupational contact dermatitis seen at a work-related dermatology service, 2000 - 2014. *Anais Brasileiros de Dermatologia*. 2019 May 9;94(2):147–56.
- [18] Mponda K, Masenga J. Skin diseases among elderly patients attending skin clinic at the Regional Dermatology Training Centre, Northern Tanzania: a cross-sectional study. *BMC Research Notes*. 2016 Feb 22;9(1).
- [19] Németh D, Pónyai G. Contact Allergy in the Elderly: A Study of 600 Patients. *Life*. 2022 Aug 13;12(8):1228.
- [20] Perhimpunan Dokter Spesialis Kulit dan Kelamin Indonesia (PERDOSKI). Panduan Praktik Klinis bagi Dokter Spesialis Dermatologi dan Venereologi Indonesia. Perhimpunan Dokter Spesialis Kulit dan Kelamin Indonesia (PERDOSKI). 2021.
- [21] Prakash AV, Davis MDP. Contact Dermatitis in Older Adults. *American Journal of Clinical Dermatology*. 2010 Dec;11(6):373–81.
- [22] Rosmalika KR, Damayanti D, Putera AM. Age and Nutritional Status as Factors Supporting Incidence of Atopic Dermatitis with Complications in Children: A Retrospective and Cross-Sectional Study. *BIKK*. 2022 Jul. 31;34(2):81-5
- [23] Rubianti MA, Prakoeswa CRS. Profil Pasien Dermatitis Kontak Alergi Akibat Kosmetik. *BIKK*. 2019 Apr. 4;31(1):35-40.
- [24] Salah S, Taieb C, Demessant AL, Haftek M. Prevalence of Skin Reactions and Self-Reported Allergies in 5 Countries with Their Social Impact Measured through Quality of Life Impairment. *International Journal of Environmental Research and Public Health*. 2021 Apr 23;18(9):4501.
- [25] Sedó-Mejía G, Soto-Rodríguez A, Pino-García C, Sanabria-Castro A, Monge-Ortega OP. Contact dermatitis: Clinical practice findings from a single tertiary referral hospital, a 4-Year retrospective study. *World Allergy Organization Journal*. 2020 Jul;13(7):100440.
- [26] Silverberg JI, Gelfand JM, Margolis D, Boguniewicz M, Fonacier L, Grayson M, et al. 282 Moderate to severe atopic dermatitis is associated with allergic, autoimmune and cardiovascular comorbidities in US adults. *Journal of Investigative Dermatology*. 2018 May;138(5):S48.

- [27] Sunaryo Y, Pandaleke HEJ, Kapantow MG. PROFIL DERMATITIS KONTAK DI POLIKLINIK KULIT DAN KELAMIN BLU RSUP PROF DR. R. D. KANDOU MANADO PERIODE JANUARI – DESEMBER 2012. e-CliniC. 2014 Feb 14;2(1).
- [28] Wang X, Li LF. Clinical features of eczema and dermatitis in the elderly: A cross-sectional study in mainland China. *European Journal of Inflammation*. 2022 Jan;20:205873922110697.
- [29] Witasari D, Sukanto H. Occupational Contact Dermatitis: Retrospective Study. *BIKK*. 2016 Mar. 14;26(3):1-7.