Vol. 36 / No. 1 / April 2024
Sinta 2 (Decree No: 200/M/KPT/2020)
Online ISSN : 2549-4082 ; Print ISSN : 1978-4279
Available online at https://e-journal.unair.ac.id/BIKK

Berkala Ilmu Kesehatan Kulit dan Kelamin

Original Article
Periodical of Dermatology and Venereology

Profile of Atopic Dermatitis at Dermatovenereology Outpatient Clinic at Tertiary Hospital in Surabaya, Indonesia

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ABSTRACT

Background: Atopic dermatitis (AD) is a pruritic skin condition with erythema, lichenified patches, and excoriations from scratching the skin that often affect the patient's quality of life. Patient history and clinical manifestations are key elements in various diagnostic criteria. Therefore, understanding clinical profile of AD patients is important. **Purpose:** To describe profile of patients with AD at the Dermatovenereology Outpatient Clinic of Dr. Soetomo General Academic Hospital Surabaya in 2019-2021. **Methods:** This study is a retrospective descriptive study using secondary data from the patients' medical records at the Dermatovenereology Outpatient Clinic of Dr. Soetomo General Academic Hospital Surabaya in 2019-2021. **Result:** There were 89 new AD patients in total, with females predominating (53.9%) and children aged 2 to 12 years (37.1%). The most common complaint was itching (83.1%) and the trigger factor was unknown (43.8%). Most patients had a previous history of atopy (52.8%) and did not know about their family history of atopy (37%). The most common lesion efflorescence was erythematous macule (59.6%) located on the inferior extremity (43.8%). The most frequent systemic therapy was cetirizine (71.9%), and topical therapy was hypoallergenic emollient (42.7%). **Conclusion:** The diagnosis of AD needs to be accurately established through the patient's history and physical examination, facilitating the implementation of appropiate management strategies. Understanding and avoiding triggering factors constitute education for AD patients and their families, enabling prevention of relapses.

Keywords: atopic dermatitis, profile, retrospective, human and disease.

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| Article info |
Submited: 10-11-2023, Accepted: 01-12-2023, Published: 31-03-2024

BACKGROUND

Atopic dermatitis (AD) is a chronic inflammatory skin condition characterized by itch as the hallmark symptom of the disease.[1] AD frequently manifests in children, yet its prevalence extends into adulthood, potentially predisposing individuals to the development of other atopic conditions. It commonly serves as the initial step of "atopic march" that leads to asthma and/or allergic rhinitis in the majority of patients.[2] AD is diagnosed by considering the existence and distribution pattern of lesions with relevant clinical findings and a personal history of atopy.

AD is a skin problem that is spreading worldwide. Its prevalence has been known to increase in the last decade, with around 15-30% in children and 1-3% in adults.[3,4] In Indonesia, based on the Indonesian Pediatric Dermatology Study Group, AD ranks first out of the top 10 pediatric skin diseases in 7 hospitals in cities in Indonesia.[5] Based on a retrospective study conducted at Dr. Soetomo General Academic Hospital Surabaya in 2012-2014, the number of AD patients increased every year, with a total of 66 patients in 2012, 92 patients in 2013, and 95 patients in 2014.[6]

AD is a skin disease that involves gene-gene and gene-environment interactions. Many studies have shown that AD is related to skin barrier dysfunction and immune dysregulation.[7] Contact between immune

DOI : 10.20473/bikk.V36.1.2024.31-40

cells in the dermis and antigens from external environment causes AD patients to experience itching, which leads to scratching. AD is characterized by intermittent periods of exacerbations and remissions that is associated with significant physical and social impact. The symptoms such as pruritic rash, erythema, lichenified patches, and excoriations from scratching the skin often affect the quality of sleep and mood of the patients. AD patients may also be affected by social stigma from their visible skin conditions.[2,8]

AD may show different patterns in different age groups.[9] The diagnosis AD itself is based on specific clinical criteria that include the patient's clinical history and manifestations. Some criteria that can be used to diagnose AD are William's criteria, Hanifin-Rajka's criteria with 3 major and 3 minor criteria, and the Scoring Atopic Dermatitis (SCORAD) index to assess the severity of AD. AD is a heterogeneous disease that requires an individual approach for each patient.

Understanding the clinical profile of AD patients is important, as patient history and clinical manifestations are key elements in AD diagnostic criteria. Therefore, this research about the clinical profile of patients with atopic dermatitis at the Dermatovenereology Outpatient Clinic of Dr. Soetomo General Academic Hospital Surabaya in 2019-2021 was conducted to help improve the diagnosis and management of atopic dermatitis.

METHODS

This study is a retrospective descriptive study using secondary data from the patients' medical records. The sample for this research was all patients that fulfilled the inclusion criteria, namely patients diagnosed with AD at Dermatovenereology Outpatient Clinic of Dr. Soetomo General Academic Hospital Surabaya from 2019 to 2021 with complete medical record data. The data taken were basic data, anamnesis results, physical examination results, and therapy. The variables of this study were age, gender, main complaint, trigger factor, patient history of atopy, family history of atopy, efflorescence of the lesion, location of the lesion, therapy, and control result. This research has been reviewed and approved by the Ethics Committee at Dr. Soetomo General Academic Hospital Surabaya (No.1113/LOE/301.4.2/XI/2022).

RESULT

The number of new AD patients registered at Dermatovenereology Outpatient Clinic of Dr. Soetomo General Academic Hospital Surabaya from 2019 to 2021 that fulfilled the inclusion criteria was 89. The highest number of visits occured in 2019 with 54 patients (60.7%) and decreased in 2020 and 2021 with the lowest number of 17 patients (19.1%) in 2020.

AD categorized into three stages based on age groups. Infantile phase (<2 years old), childhood phase (2-12 years old), and adult phase (≥12 years). The findings of this study indicate a predominant occurence in the children phase with a total of 33 patients (37.1%) and the lowest number was in the infantile phase with a total of 26 patients (29.2%).

Table 1. Distribution of patients with atopic dermatitis

Subject characteristics	Year			Total (%)
	2019	2020	2021	
Number of patients	54	17	18	89 (100)
Gender:				
-Female	30	7	11	48 (53,9)
-Male	24	10	7	41 (46,1)
Age group:				
-Infantile	23	3	0	26 (29.2)
-Children	19	7	7	33 (37.1)
-Adults	12	7	11	30 (33.7)

The most frequent main complaint among AD patients was itching, reported by 74 patients (83.1%) followed by redness patches in 57 patients (64%) (Table 2). Individual patient may have experienced more than one main complaint. The majority of patients reported that their complaints lasted less than a month. Among 89 patients, 47 (52.8%) had a history of atopy, with AD being the most prevalent type (Table 2). The majority of patients did not know about their family history of atopy, with 33 patients (37%). The most common trigger factor was unknown, with a total of 39 patients (43.8%) followed by food/drink in 25 patients (28.1%), and season in 15 patients (16.9%) (Table 3). Stratified by age groups, the most common trigger factor for the infantile and children groups was unknown, while for the adult group it was food/drink. Each patient may have experienced more than one trigger factor.

The most prevalent lesion efflorescence was erythematous macule in a total of 53 patients (59.6%) followed by papule in 38 patients (42.7%) (Table 4). Each patient may have exhibited more than one type of lesion efflorescence. Stratified by age groups, the

predominant lesion efflorescence in the infantile group was erythematous macules followed by papules, in the children group was hyperpigmented macule followed by erythematous macules and papules, and in adult group, erythematous macules were followed by hyperpigmented macules.

Each patient may have experienced lesions in multiple locations. The most common lesion location was inferior extremity, with the number of 39 patients (43.8%) (Table 4). Based on the age group, it was observed that the most common location in the infantile group was buccal, in the children group was flexural, and in the adult group was superior and inferior extremities.

Table 2. Anamnesis of patients with atopic dermatitis

Anamnesis	Year			Total (%)
	2019	2020	2021	
Main complaint:				
-Redness patches	38	8	11	57 (64)
-Brown patches	11	1	1	13 (14.6)
-White patces	2	0	1	3 (3.4)
-Itch	43	14	17	74 (83.1)
-Lump	16	9	4	29 (32.6)
-Dry skin	1	3	2	6 (6.7)
-Wound	5	2	2	9 (10.1)
-Burning skin	1	0	0	1 (1.1)
Duration:				
-<1 month	24	10	4	38 (42.7)
-1-12 month	20	5	9	34 (38.2)
-≥12 month	10	2	5	17 (19.1)
Personal history of atopy:				
-Patients with history of atopy	26	10	11	47 (52.8)
-Patients without history of atopy	21	6	3	30 (33.7)
-Unknown	7	1	4	12 (13.5)
Family history of atopy:				
-Patients with family history of atopy	18	8	6	32 (36)
-Patients without family history of atopy	13	6	5	24 (27)
-Unknown	23	3	7	33 (37)
Type of atopy history in patient (n=47)				
-AD	20	8	7	35 (74.5)
-AD+Ashtma	2	1	1	4 (8.5)
-AD+Rhinitis allergy	3	0	2	5 (10.6)
-Rhinitis allergy	1	1	1	3 (6.4)

Note: each patient may have more than one main complaint
AD: Atopic Dermatitis

Table 3. Trigger factors in patients with atopic dermatitis based on age group at Dermatovenereology Outpatient Clinic of Dr. Soetomo General Academic Hospital Surabaya (2019-2021)

Trigger factors	Age			Total (%)
	<2 Years Old	2-12 Years Old	≥12 Years Old	
-Food/drink	2	6	17	25 (28.1)
-Medicine	0	0	1	1 (1.1)
-Insect bite	1	2	1	4 (4.5)
-Contact	3	6	3	12 (13.5)
-Season	0	7	8	15 (16.9)
-Emotion	0	0	6	6 (6.7)
-Inhaled allergens	0	2	1	3 (3.4)
-Sweat	0	5	2	7 (7.9)
-Unknown	20	13	6	39 (43.8)

Note: each patient may have more than one trigger factor

Table 4. Physical examination in patients with atopic dermatitis based on age group

Lesion characteristics	Age			Total (%)
	<2 Years Old	2-12 Years Old	≥12 Years Old	
Efflorescence:				
-Erythematous macule	21	13	19	53 (59.6)
-Hyperpigmented macule	3	17	15	35 (39.3)
-Hypopigmented macule	1	2	1	4 (4.5)
-Papule	11	13	14	38 (42.7)
-Pustule	1	3	2	6 (6.7)
-Nodule	0	2	0	2 (2.2)
-Erotion	3	9	9	21 (23.6)
-Excoriation	1	3	4	8 (9)
-Lichenification	1	1	8	10 (11.2)
-Xerosis	1	7	10	18 (20.2)
-Urticaria	0	0	1	1 (1.1)
-Crust	0	4	3	7 (7.9)
-Squama	6	4	6	16 (18)
-Plaque	0	1	1	2 (2.2)
Morphology:				
-Acute	19	8	10	37 (41.6)
-Subacute	6	22	12	40 (44.9)
-Chronic	1	3	8	12 (13.5)
Location:				
-Buccal	18	4	4	26 (29.2)
-Colli	2	7	3	12 (13,5)
-Thoracalis anterior	3	4	2	9 (10.1)
-Thoracalis posterior	2	3	2	7 (7.9)
-Abdomen	1	4	2	7 (7.9)
-Superior extremity	7	12	17	36 (40.4)
-Inferior extremity	5	17	17	39 (43.8)
-Flexural	5	18	14	37 (41.6)
-Others	3	4	4	11 (12.4)

Note: each patient may have more than one lesion efflorescence and location

The most frequently given systemic therapy in AD patients was cetirizine with a total of 64 patients (71.9%). Regarding topical therapy, the most commonly prescribed was hypoallergenic emollient, with 38 patients (42.7%) (Table 5). Among the 89 patients, 27 returned for follow-up visits at the Dermatovenereology Outpatient Clinic of Dr. Soetomo General Academic Hospital. Among those 27 patients, 17 patients attended follow-up visits, primarily occuring once after the initial visit. In terms of outcomes, 5 patients achieved recovery, 13 patients exhibited improvement, and 9 patients experienced relapses.

DISCUSSION

The highest number of new AD patients at the Dermatovenereology Outpatient Clinic of Dr. Soetomo General Academic Hospital Surabaya in 2019-2021 was in 2019, with a total of 54 patients (60.7%) (Table 1). The visit rate decreased in 2020 and 2021. It is different from the findings of prior research conducted at the Dermatovenereology Outpatient Clinic of Dr. Soetomo General Academic Hospital in 2012-2014 that showed an increase in the number of new AD patients.[6] The significant decrease in new patients from 2019 to 2020 and 2021 may be attributed to the onset of the COVID-19 pandemic that began in 2020. Similar trends have been reported in research conducted at Prof. Dr. R. D. Kandou Hospital Manado in 2019-2021, indicating a decline in the number of AD patients during the pandemic years.[10] The pandemic prompted individuals to restrict their mobility to prevent transmission of the SARS-CoV-2 virus, leading to a decline in hospital visits. Additionally, the decrease in AD cases during the pandemic may be associated with changes in hygiene practices. Amidst the COVID-19

pandemic, alterations in behavior, such as wearing masks and increased indoor ventilation, are potentially resulting in reduced exposure to allergens and the occurence of AD.[11]

Table 5. Systemic and topical therapy in patients with atopic dermatitis

	Year			Total (%)
	2019	2020	2021	
Systemic therapy				
Antihistamine:				
-Cetirizine	35	13	16	64 (71.9)
-Chlorpheniramine	1	0	0	1 (1.1)
-Loratadine	0	1	0	1 (1.1)
Oral steroid:				
-Dexamethasone	10	0	1	11 (12.4)
-Methylprednisolone	0	1	0	1 (1.1)
Oral antibiotics:				
-Amoxicillin	1	0	0	1 (1.1)
-Cloxacillin	1	0	0	1 (1.1)
Topical therapy				
Topical steroids:				
-Mometasone furoate cream	16	6	7	29 (32.6)
-Hydrocortisone cream	22	3	1	26 (29.2)
-Betamethasone cream	1	0	0	1 (1.1)
-Desoximethasone cream	5	5	6	16 (18)
Moisturizer:				
-Hypoallergenic emollient	15	9	14	38 (42.7)
-Urea cream	3	3	1	7 (7.9)
-Vaseline album	4	0	1	5 (5.6)
-Ambiphilic hypoallergenic cream	2	0	0	2 (2.2)
-Pseudoceramide cream	1	1	0	2 (2.2)
Others:				
-Sodium fusidate cream	5	4	8	17 (19.1)
-Wet dressing with normal saline	1	0	1	2 (2.2)
-Ketoconazole cream	1	0	0	1 (1.1)
-Zinc oxide	1	0	0	1 (1.1)
-Salicyl powder	3	0	0	3 (3.4)

Note: each patient may have more than one systemic and topical therapy

This study showed a predominance of female patients among AD patients. It is consistent with prior research conducted at the Dermatovenereology Outpatient Clinic Dr. Soetomo General Academic Hospital Surabaya in 2012-2014 and at Dr. H. Abdul Moeloek Lampung in 2019 which also found that there was a higher prevalence of female AD patients.[612] Existing literature supports the notion that AD is more prevalent in females, with a reported ratio of 1.3:1.[1] This gender disparity may be attributed to the greater influence of female hormones on the development of type 2 immunity, rendering AD more common in women.[13] Additionally, it may also be related to stress as a risk factor. An increase in the female hormone, progresterone, can induce emotions, anxiety, fatigue, and headaches, which can trigger allergic manifestations.[12]

AD is classified into 3 stages based on the age group: infantile phase (<2 years old), children phase (2-12 years old), and adult phase (≥12 years old). This skin condition is more prevalent in children than adults.[14] Symptoms of AD may appear for the first time at any age, but generally symptoms appear before the age of 5 years old, with the highest prevalence between the ages of 3 and 6 months old.[15] The findings of this study indicate a higher incidence of AD patients in the childhood phase compared to the adult phase. However, the lowest distribution was in infantile phase. The low number of AD cases in the infantile phase rather than other phases is potentially because of the diagnostic challenge of differentiating AD from seborrheic dermatitis in infants. AD in patients aged 6-12 weeks is often confused with seborrheic dermatitis because there is an assumption that dermatitis arises before the age of 3 months is seborrheic dermatitis and the age of more than 3 months are AD. Furthermore, new AD infant patients at Dr. Soetomo General Academic Hospital Surabaya are not only treated at the dermatovenereology outpatient clinic, but may also be treated at pediatrics outpatient clinic.[16]

This study reveals that the predominant main complaint in AD patients was itching, followed by red patches. This aligns with earlier investigations conducted at the Dermatovenereology Outpatient Clinic Dr. Soetomo General Academic Hospital Surabaya in 2007-2011 and 2012-2014, which identified itching as the most frequently reported main complaint among AD patients.[6,17] Similarly, research conducted at Prof. Dr. R. D. Kandou Hospital Manado in 2019-2021 corroborates these findings, highlighting itching and red patches as the most prevalent complaints.[10]The cause of itching in AD patients is attributed to the disruption of the skin barrier, rendering the skin susceptible to xerosis and exposure to allergens. The disruption of the skin barrier itself is caused by impaired expression of the filaggrin (FLG) gene, which encodes a structural protein that plays a role in the formation of skin barrier. Furthermore, reduced ceramide levels contribute to compromised skin barrier function, affecting transepidermal water loss (TEWL).[2] The itchiness experienced by AD patients will trigger the patient to scratch their skin resulting in an itch-scratch cycle. The repetitive scratching can exacerbate skin damage and make it easier for infectious agents to infect the skin, thereby exacerbating the disease by triggering secondary lesions in the form of papules, erosions, and progressing towards a chronic process characterized by lichenification.[5,18]

This study shows that the majority of patients came to the clinic to seek treatment with the duration of complaints experienced for less than a month. This finding is consistent with the previous study conducted at Dr. Soetomo General Academic Hospital in 2012-2014 which showed the same result for the duration of patients' complaints. [6] Severe symptoms of AD may disrupt sleep patterns and induce stress for the patients and their family.[10]

The most common triggering factor among AD patients in this research was unknown, followed by food/drink and season. Some patients may have difficulty identifying the triggering factors of AD due to the fluctuating process of AD. AD has an intermittent course with alternating relapse and remission, often for unexplained reasons.[19] Other research conducted at Prof. Dr. R. D. Kandou Hospital Manado in 2019-2021 showed food/drink as the most common triggering factors for AD patients.[10] One of the diagnostic tests that can be used to detect the presence of specific IgE against a particular allergen as the cause of AD exacerbations is the skin prick test. A study conducted at the Dermatovenereology Outpatient Clinic Dr. Soetomo General Academic Hospital Surabaya in 2007-2012 showed that 19 AD patients (33.3%) had positive skin prick test results for one or more allergens, both inhaled and food allergens. AD patients with positive skin prick results were found to have more severe AD manifestations and complaints than AD patients with negative skin prick test results.[20]

Some food/drink that became the triggering factors in this study were egg, seafood, sausage, foods with monosodium glutamate (MSG), milk, and chocolate. Food/drink as one of the triggering factors for AD is also supported by a research conducted in Singapore and Malaysia which states that frequent consumption of foods high in the glycemic index or high in fat is positively related to the occurrence of AD.[21] AD exacerbation by food occurs with increased antigen binding to immature intestinal microvilli and increased intestinal permeability, which triggers an immune response.[22] Additionally, the season is also a triggering factor for AD. Hot weather causes the skin to sweat while cold weather causes the skin to become dry. Each of these conditions is a trigger for itching.[15]

This study further examines the distribution of AD triggering factors based on age groups. In the infantile and childhood groups, the most prevalent triggering factor was unknown. This observation suggests that patients in these age groups may not have yet identified the triggering factors of AD, considering that AD typically manifests for the first time at these ages. As for the adult group, the most common triggering factor was food/drink. This finding aligns with existing research indicating a significant relationship between IgE-mediated food allergies and the severity of AD in adults.[14]

AD is associated with other allergic conditions and serves as an early manifestation of atopic march. The majority of AD patients usually exhibit a personal and/or family history of atopy, including bronchial asthma and allergic rhinitis.[21] In this study, most patients had a personal history of atopy, with a total of 47 patients (52.8%) (Table 2). Consistent findings were reported in the other studies conducted at Dr. Soetomo General Academic Hospital in 2012-2014 and at Prof. Dr. R. D. Kandou Hospital Manado in 2019-2021, with the number of patients with a personal history of atopy being greater than those without.[6,10] Furthermore, it was observed that the most prevalent type of atopy history among the patients was AD, namely in 35 patients (74.5%). AD is a condition with periods of relapse and remission.[23] Therefore, patients may have experienced previous episodes of AD. In this study, 32 patients (36%) had a family history of atopy, while 24

patients (27%) did not (Table 2). These results align with other research, emphasizing that a family history of AD has a significant effect on an increased risk of AD.[21] A child with a history of atopy has a 25% risk of atopy, whereas a child with both parents having a history of atopy has a 50% risk of atopy, and this relates to many genes that may have role in the development of atopic disease, which then undergo complex interactions with enviromental factors.[24]

This study shows that the most common lesions efflorescence in AD patients was erythematous macule, namely in 53 patients (59.6%), followed by papules in 38 patients (42.7%), and hyperpigmented macule in 35 patients (39.3%). Notably, each AD patient may exhibit more than one type of efflorescence. These findings align with similar results obtained from research conducted at Dr. Soetomo General Academic Hospital Surabaya in 2012-2014, where the most common lesions were erythema and papules.[6] Another study conducted at Haji Adam Malik General Hospital Medan in 2014-2016 also showed that the most common lesions efflorescence in AD patients were papules and macules.[25] Similarly, research conducted at Prof. Dr. R. D. Kandou Hospital Manado in 2019-2021 showed that the most common lesions efflorescence were erythema macules and papules.[10]

Based on the age group, the most common lesions in the infantile group were erythematous macules, papules, and squama (Table 4). This is in accordance with the theory that in the infantile phase, the lesions are usually acute, erythematous, papules, vesicles, erosions, exudation/oozing, and crusts.[26] The most common lesion efflorescence in patients from the childhood group in this study were hyperpigmented macules, erythematous macules, and papules. This is also in accordance with the theory that during childhood phase, the lesions are usually in the form of subacute lesions, which are drier.[26] As for patients from the adult age group in this study, the most common lesions efflorescence were in the form of erythematous macules, hyperpigmented macules, and papules. Notably, lichenification lesions were predominantly found in the adult group, aligning with the theory that AD patients in the adult group usually have chronic, dry lesions, erythematous papules or plaques, scales, and lichenification.[26]

AD is divided into three phases based on the morphology of lesions, namely acute, subacute, and chronic. Acute AD presents as papules, vesicles, and crusts with or without erythematous lesions; subacute AD manifests as patches accompanied by minimal scaling and crusts; and chronic AD is characterized by hyperpigmented lesions and lichenification with or without scales and crusts.[16] This study shows a pattern where acute AD is predominantly observed in the infantile phase, subacute AD in the childhood phase, and chronic AD in the adult phase. It is important to highlight that it is not possible to differentiate between extrinsic and intrinsic AD based only on the clinical presentation of the lesions.[4]

The majority of AD patients in this research had their lesions in the inferior extremity, with 39 patients (43.8%), followed by flexural areas in 37 patients (41.6%), and superior extremities in 36 patients (40.4%) (Table 4). Another study conducted in America also shows similar results, with the most common distribution of AD lesions occured in the popliteal fossa, cubital fossa, cruris, and pedis.[28] Similarly, research conducted at Prof. Dr. R. D. Kandou Hospital Manado in 2019-2021 also showed that the most common area of lesions in AD patients was the flexural area.[10] Involvement of the flexural areas in AD may be influenced by variations in pH, skin thickness, and the composition of microorganisms and antimicrobial peptides. The combination of moisture, warmth, and friction in the flexural areas can enhance the clinical response when exposed to environmental factors, such as allergens, bacteria, and fungi.[27] The distribution of AD lesions may vary across age groups. Typically, in the infantile phase, lesions are more concentrated on facial areas such as the cheeks but can also spread to the extremities. In the childhood phase, lesions are prevalent on the wrist, ankle, flexural areas, neck, and infragluteal area. In the adult phase, lesions tend to extend to flexural areas of the face, neck, upper arms, back of the hands, and feet, as well as the fingers and toes.[26] According to the theory, AD lesions can extend to both superior and inferior extremities in every phase of AD, aligning with the findings of this study, which show inferior and superior extremities as the most common areas for AD lesions. This research also shows the distribution of lesion locations based on age groups, which is consistent with the theory. The most prevalent lesion location in the infantile group was buccal; in the childhood group, it was flexural area; and in the adult group, it was superior and inferior extremities. These findings parallel another study conducted at Haji Adam Malik General Hospital Medan in 2014-2016, which reported that the most frequent lesion locations in the infantile group were the face and trunk; in the childhood group, trunk and flexural area; and in the adult group, extremities.[25]

The management of AD is divided into systemic and topical therapies. Each patient can recieve more than one type of therapy. Systemic therapy is usually administered to AD patients who exhibit persistent, extensive lesions and are unresponsive to other therapies.[10] The systemic therapy group includes antihistamines, oral steroids, and oral antibiotics, while topical therapy includes topical steroids, moisturizers, and others (sodium fusidat cream, wet dressing with normal saline, ketoconazole cream, zinc oxide, and salicyl powder). The most frequently prescribed systemic therapy in this study was antihistamine in the type of cetirizine (Table 5). Other research conducted at Haji Adam Malik General Hospital Medan in 2014-2016 and at Prof. Dr. R. D. Kandou Hospital Manado in 2019-2021 also showed that the most frequently given systemic therapy for AD patients was antihistamine in the form of cetirizine.[10,25] Antihistamines were given to AD patients to control and eliminate the itch-scratch cycle.

In this study, the most frequently prescribed oral steroid was dexamethasone. PPK KSM Kesehatan Kulit dan Kelamin RSUD Dr. Soetomo Surabaya 2022 states that oral corticosteroids can be given briefly for up to 1 week in acute, chronic, severe, or widespread AD exacerbations.[26] Another type of oral therapy were oral antibiotics, namely amoxicillin and cloxacillin. Systemic antibiotics are not given routinely to AD patients and usually given only to patients with secondary infections. Previous research conducted at the Dr. Soetomo General Academic Hospital Surabaya in 2009-2011 showed that the most common prescribed oral antibiotics for AD patients were erythromycin and cloxacillin.[17] The choice of antibiotics given to AD patients were slightly different with research conducted at Prof. Dr. R. D. Kandou Hospital Manado in 2019-2021, which was erythromycin, cefixime, and amoxicillin, and at Haji Adam Malik General Hospital Medan in 2014-2016, which was erythromycin, gentamicin, cefadroxil.[10,25] Cephalosporin, or penicillinase-resistant penicillin (dicloxacillin, cloxacillin, and flucoxacillin), is a systemic antibiotic active against staphylococci and streptococci and is considered first-line therapy according to the 2007 National Institute for Health and Clinical Excellence (NICE) guidelines for the management of systemic AD infections in children.[10]

The most frequently prescribed topical therapy in this study was hypoallergenic emollient moisturizer (Table 5). Other research conducted at Haji Adam Malik General Hospital Medan in 2014-2016 showed a similar result with moisturizer as the most frequently prescribed topical therapy for AD patients.[25] This aligns with the recommendations from PPK Perdoski 2021, which state that the principle of AD management, apart from modifying environmental triggers by avoiding irritants and allergens, is to strenghthen and mantain optimal skin barrier function by applying moisturizer immediately after bathing.[26] Moisturizers are available in various forms, such as lotions, creams, and ointments, with the choice depending on patient preference to enhance compliance.[28] However, in acute inflammatory conditions, the use of additional topical steroids is recommended is recommended before applying moisturizer to avoid reducing its effectiveness. In this study, the most frequently prescribed topical steroid was mometasone furoat cream. The other topical therapy prescribed was an antibiotic, namely sodium fusidate cream. Antibiotics are usually used in AD patients with secondary infection. Secondary infections in AD patients are often caused by S. *aureus* bacteria, which is a pathogenic organism that is more prone to attacking the skin with chronic epithelial disorders.[29]

Out of 89 patients in this study, as many as 62 patients (69.7%) did not undergo follow-up visits, while 27 patients (30.3%) did. In this study, patients were categorized as having a follow-up visit if they return to Dermatovenereology Outpatient Clinic of Dr. Soetomo General Academic Hospital Surabaya after their initial visit within the data collection period, namely until December 2022. The higher number of patients not returning for follow-up visits is likely attributed to the impact of the COVID-19 pandemic, which restricted people's mobility. Among the 27 patients who did follow-up visits, 17 had a single follow-up visit after the initial one. The result showed that from those 27 patients, 5 of them were recovered, 13 of them showed improvement, and 9 of them experienced relapse. The outcomes from patient follow-up visits can be associated with the effectiveness of patient education. The results from this study indicate that patients with more follow-up visits generally exhibited improved conditions. Education to patients is one of the five pillars of AD management and has been shown to contribute to better disease control. Education itself, based on PPK Perdoski 2021 includes knowledge regarding the symptoms, causes, trigger factors, and prognosis of AD. Apart from that, education about AD management is also important, encompassing information on the type of therapy, dosage, direction to use, duration of therapy, how to

increase and decreace potency, and discontinuation of therapy.[26]

In conclusion, the majority of AD patients in this study were females aged 2-12 years, commonly presenting with itching as their primary complaint, and mostly did not know the triggering factors. The majority of patients had a previous history of atopy, predominantly in the form of AD, and did not know about their family history of atopy. The most common lesions efflorescence was erythematous macules, predominantly located on the inferior extremity. Cetirizine and hypoallergenic emollients were the most frequently adminestered therapy. The diagnosis of atopic dermatitis needs to be accurately established through the patient's history and physical examination, facilitating the implementation of appropiate management strategies. Understanding and avoiding triggering factors constitute education for AD patients and their families, enabling prevention of relapses.

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