Vol. 35 / No. 2 / August 2023
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

Retrospective Study: Management of Atopic Dermatitis

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ABSTRACT

Background: Atopic dermatitis (AD) is a chronic skin inflammatory disease characterized by mild to severe itching, relapses, and mostly appears in infants and children. Although there have been current advances in the management of AD, satisfactory treatment has not been achieved. **Purpose:** To evaluate the treatment of patients with AD in order to provide better management. **Methods:** A retrospective study of newly diagnosed AD patients at the Allergy and Immunology Division of the Outpatient Unit, Dermatology and Venereology Clinic, Prof. Dr. R.D. Kandou Hospital Manado from 2019-2021. **Result:** Antihistamines were the most widely prescribed medication, administered to 108 patients of all patients' visits, and 94 (87%) of them were given cetirizine (the most widely prescribed type). Emollients were used adequately; they included petroleum jelly in 82 patients (90.1%) and urea 10% cream in 9 patients (9.9%). **Conclusion:** There were 108 AD patients in Dermatology and Venereology Clinic, Prof. Dr. R.D. Kandou Hospital Manado from 2019-2021. Treatment with antihistamine and emollient therapy gave satisfactory results.

Keywords: atopic dermatitis, management, retrospective.

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| Article info |
Submited: 28-09-2022, Accepted: 12-12-2022, Published: 31-07-2023

BACKGROUND

Atopic dermatitis (AD) is a chronic skin inflammatory disease characterized by mild to severe itching, relapses, and mostly appears in infants and children.[1,2] The prevalence of AD has tripled since 1960.[2] This increasing incidence is thought to be caused by several factors, such as urbanization, pollution, and the hygiene hypothesis.[3] AD has become a global health issue with a prevalence in children at 10-20% and in adolescents at 1-3%.[2] Around 50% of AD cases begin to occur in the first year of life.[1] The prevalence of AD in Southeast Asia varies between countries, from 1.1% in the age group of 13-14 years old in Indonesia to 17.9% in the age group of 12 years old in Singapore.[4] The number of newly diagnosed AD patients at the Dermatology and Venereology Clinic, Prof. Dr. R. D.Kandou Hospital Manado, from 2010-2012 was 461 patients, consisting of 289 females (62.69%) and 172 males (37.31%).[5]

Various factors influence the pathogenesis of AD, including genetic factors related to skin barrier disorders, immunologic disorders, and environmental factors.[6] AD patients often suffer from an increase in *transepidermal water loss* (TEWL), dry skin, and increased IgE serum levels. Dry skin facilitates the entry of allergens, irritants, and skin pathological conditions.[3] Cytokines IL-2, IL-6, and IL-8 play a role in pruritus in many AD patients.[7] Clinically, AD is divided into 3 categories, namely AD in infants (2 months – 2 years old), children (2-10 years old), and adolescents (>10 years old). The main symptom of AD, which is itching, can be found in all categories.[1]

The diagnosis of AD is based on clinical findings and not on certain laboratory examinations.[6] Several diagnostic criteria have been proposed by many dermatologists, but what is often used in Indonesia is the Hanifin Rajka's criteria which includes major and minor criteria.[3] Other criteria, like William's criteria, is a practical diagnosis criteria, often used in epidemiological studies.[8] The severity of an AD diagnosis is usually associated with the type of therapy administered to the patient.[2] The severity of AD uses a

DOI : 10.20473/bikk.V35.2.2023.116-125

calculation scale proposed by dermatologists in Europe, namely the *Scoring for Atopic Dermatitis* (SCORAD) index.[3]

The Asia-Pacific guidelines encompass holistic management of AD,which is contained in the 5 pillars of AD management, including patient education, prevention and modification of triggering factors, improvement of optimal skin barrier function, management of inflammatory skin disorders, and control of the itch-scratch cycle.[4] Currently, progress has been made in the management of AD, but due to the chronic and relapsing nature of the disease, satisfactory treatment has not yet been achieved in general.[3] Poor adherence to therapy treatment is often found due to long-term drug use, both during the relapse and care periods.[5] Therapy failure and/or inadequate therapy can cause recurrent inflammatory lesions, interfere with the quality of life of patients and their families, and cause a persistent sleeping disorder.[3]

METHODS

This study was conducted in a retrospective manner by observing the medical records of newly diagnosed AD patients in the Allergy and Immunology Division of the Outpatient Unit, Dermatology and Venereology Clinic, Prof. Dr. R. D. Kandou Hospital Manado from 2019-2021. Medical records included basic data (number of patients, age distribution, sex), anamnesis (complaints, duration of illness, history of atopy, influencing factors), clinical symptoms (location and morphology of lesions, other skin disorders), laboratory examinations, management, and follow-up. This study has received ethical approval from the Hospital Ethics Committee of Prof. Dr. R. D. Kandou Hospital Manado (PP 04.03/XIX.3/3206/2022).

RESULT

The number of AD patients registered at the Allergy and Immunology Division of the Outpatient Unit, Dermatology and Venereology Clinic, Prof. Dr. R. D. Kandou Hospital Manado from 2019-2021 was 108. The highest visits occurred in 2019, with around 41 patients out of 105 patients at the Allergy and Immunology Division and 571 patients in the Dermatology and Venereology Clinic. The majority of the patients were female (67 patients, or 62%), and the rest were male (41 patients, or 38%). Patients were mostly over the age of 12 (adolescents), with a total of 60 (55,6%) (Table 2).

Table 1. Distribution of newly diagnosed atopic dermatitis patients at the Allergy and Immunology Division, Dermatology and Venereology Clinic, Prof. Dr. R. D. Kandou Hospital Manado from January 2019-December 2021

New Patient of-	Year			Total
	2019	2020	2021	
AD	41	33	34	108
Allergy and Immunology Division	105	94	91	290
Dermatology and Venereology Clinic	571	248	291	1110

AD = Atopic Dermatitis

These patients came to the hospital with various main complaints, including the most common one, which was itching in 67 patients (62%), itching and red lesions in 31 patients (28.7%), as well as itching and dry skin in 10 patients (9.3%). The main complaint began to appear in less than a month,according to 53 patients (49.1%). There were 66 patients (61.1%) who suffered from recurrent itching and 42 patients (38.9%) had itching,when sweating (Table 3).

There were 66 patients (61.1%) with a history of atopy and 42 patients (38.9%) with none (Table 3). Based on the anamnesis concerning factors facilitating AD, food/drink was a major trigger in 68 patients (39,3%), followed by stress in 40 patients (23.1%) (Table 4).

Lesions were mostly found on the flexor area in 66 patients (50.4%). The most common type of lesion was erythema, found in 81 patients (22%). Another skin disorder that was often found was hand dermatitis, which was observed in 26 patients (33.3%) (Table 5).

One AD patient can receive more than one type of therapy. In this study, antihistamines were most frequently given to patients with AD. Of the 108 patients (32,5%) given various antihistamines, 94 patients (87%) were given cetirizine, 86 patients (25,9%) were given topical steroids, and 30 patients (34,9%) were given betamethasone 0.1%. Petroleum jelly was administered to 82 patients (90.1%) and urea 10% cream was administered to 9 patients (9.9%). Methylprednisolone was the most common type of oral steroid given to patients, with 20 patients (71.4%) receiving it. In addition, oral antibiotics were observed in 8 patients (2.3%), and the most common drug was erythromycin in 4 patients (50%); meanwhile, topical antibiotics were administered to 17 patients (4.9%), and the most common drug was natrium fusidate (Table 5).

After the first visit, 21 patients (19.4%) went through one follow-up visit and 15 of them showed improvement (71.4%); 8 patients (7.4%) had twice the number of follow-up visits and 6 of them showed improvement (75%); and 5 patients (4.6%) had more than thrice the number of follow-up visits and all of them achieved improvement (100%). On the other hand, there were 74 patients who had not came for follow-up visits (68.5%). After the first visit, 6 patients (75%) relapsed once, and 2 patients (25%) relapsed twice (Table 7).

Table 2. Distribution of newly diagnosed atopic dermatitis patients based on sex and age at the Allergy and Immunology Division, Dermatology and Venereology Clinic, Prof. Dr. R. D. Kandou Hospital Manado from January 2019 - December 2021

	Year			Total (%)
	2019 (%)	2020 (%)	2021 (%)	(n=108)
Sex	(n=41)	(n=33)	(n=34)	
-Female	27 (65.9)	17 (51.5)	23 (67.6)	67 (62)
-Male	14 (34.1)	16 (48.5)	11 (32.4)	41 (38)
Age group (year):				
- 0-2 (infants)	5 (12.2)	3 (9.1)	5 (14.7)	13 (12)
- 3-12 (children)	14 (34.1)	13 (39.4)	8 (23.5)	35 (32.4)
- >12 (adolescents)	22 (53.7)	17 (51.5)	21 (61.8)	60 (55.6)

Table 3. Distribution of major main complaint, beginning of symptoms, characteristic of itching observed in newly diagnosed atopic dermatitis patients at the Allergy and Immunology Division, Dermatology and Venereology Clinic, Prof. Dr. R. D. Kandou Hospital Manado from January 2019 - December 2021

Anamnesis	Year			Total (%)
	2019 (%)	2020 (%)	2021 (%)	(n=108)
	(n=41)	(n=33)	(n=34)	
Main chief complaints:				
- Itching	26 (63.4)	23 (69.7)	18 (52.9)	67 (62)
- Itching + red lesions	12 (29.3)	8 (24.2)	11 (32.4)	31 (28.7)
- Itching + dry skin	3 (7.3)	2 (6.1)	5 (14.3)	10 (9.3)
Onset:				
- < 1 month	23 (56.1)	12 (36.4)	18 (52.9)	53 (49.1)
- 1 – 12 months	11 (26.8)	17 (51.5)	13 (38.2)	41 (38)
- > 12 months	7 (17.1)	4 (12.1)	3 (8.8)	14 (13)
Itching:				
- When sweating	17 (41.5)	10 (30.3)	15 (44.1)	42 (38.9)
- Recurring	24 (58.5)	23 (69.7)	19 (55.9)	66 (61.1)
History of atopy:				
- Yes	27 (65.9)	21 (63.6)	18 (52.9)	66 (61.1)
- No	14 (34.1)	12 (36.4)	16 (47.1)	42 (38.9)

Table 4. Factors triggering atopic dermatitis observed in patients at the Allergy and Immunology Division, Dermatology and Venereology Clinic, Prof. Dr. R. D. Kandou Hospital Manado from January 2019 - December 2021

Triggering factors	Year			Total (%)
	2019	2020	2021	(n=108)
Wool	2	0	1	3 (1.7)
Season	9	5	3	17 (9.8)
Stress	18	13	9	40 (23.1)
Food/drink	28	22	18	68 (39.3)
Inhaled allergens	12	9	7	28 (16.2)
Others	11	2	4	17 (9.8)

*one patient may have more than one triggering factor

Table 5. Distribution of area and morphology of lesions and other skin disorders observed in newly diagnosed atopic dermatitis patients at the Allergy and Immunology Division, Dermatology and Venereology Clinic, Prof. Dr. R. D. Kandou Hospital Manado from January 2019 - December 2021

	Year			Total (%)
	2019	2020	2021	(n=108)
Area of lesions				
Face	8	6	3	17 (13)
Flexor	27	21	18	66 (50.4)
Extensor	19	13	16	48 (36.6)
Morphology of lesions:				
- Erythema	31	24	26	81 (22)
- Vesicle	2	1	3	6 (1.6)
- Erosion	19	14	15	48 (13)
- Lichenification	25	18	12	55 (14.9)
- Xerosis	21	22	15	58 (15.8)
- Papules	27	16	19	62 (16.8)
- Pustules	6	3	2	11 (3)
- Excoriation	8	4	5	17 (4.6)
- Ichthyosis	4	2	1	7 (1.9)
Others:				
- Squama	6	4	2	12 (3.3)
- Hyperpigmentation	4	3	3	10 (2.7)
- Hypopigmentation	0	0	1	1 (0.3)
Other skin disorders:				
- Secondary infection	7	6	4	17 (21.8)
- Nipple dermatitis	2	0	1	3 (3.8)
- Pale face/red skin	2	4	1	7 (9)
- Hand dermatitis	8	12	6	26 (33.3)
- Pityriasis alba	3	5	2	10 (12.8)
- Front neck crease	5	7	3	15 (19.2)

*one patient may have more than one lesion

Table 6. Distribution of management of newly diagnosed atopic dermatitis patients at the Allergy and Immunology Division, Dermatology and Venereology Clinic, Prof. Dr. R. D. Kandou Hospital Manado from January 2019-December 2021

	Year			Total (%) (n=108)
	2019	2020	2021	
Type of therapy				
Antihistamines	41	33	34	108 (32.5)
Oral steroids	13	9	7	29 (8.7)
Oral antibiotics	3	3	2	8 (2.4)
Emollients	35	26	31	92 (27.7)
Topical steroids	34	26	26	86 (25.9)
NaCl 0.9% wet compress	4	2	2	8 (2.4)
Salicyl talk	1	0	0	1 (0.3)
Types of oral antihistamines:				
- Chlorpheniramine maleate	3	5	3	11 (10.2)
- Mebhydrolin napadisylate	0	1	0	1 (0.9)
- Cetirizine	36	27	31	94 (87)
- Loratadine	2	0	0	2 (1.9)
Types of oral steroids:				
- Dexamethasone	1	0	1	2 (7.1)
- Prednisone	4	2	0	6 (21.4)
- Methylprednisolone	8	6	6	20 (71.4)
Types of antibiotics:				
Oral antibiotic:				
- Erythromycin	2	1	1	4 (50)
- Amoxicillin	1	0	0	1 (12.5)
- Cefixime	0	2	1	3 (37.5)
Topical antibiotic:				
- Natrium fusidate	7	6	4	17 (4.9)
Type of emollient:				
- Urea 10%	0	3	6	9 (9.9)
- Petroleum jelly	35	22	25	82 (90.1)
Types of topical steroids:				
- Hydrocortisone 2.5%	6	3	5	14 (16.3)
- Desoximetasone 0.25%	4	7	5	16 (18.6)
- Diflucorto lone valerate 0.1%	2	0	1	3 (3.5)
- Desonide 0.05%	3	1	0	4 (4.7)
- Mometasone furoate 0.1%	4	2	3	9 (10.5)
- Betamethasone 0.1%	12	10	8	30 (34.9)
- Clobetasol propionate 0.05%	3	3	4	10 (11.7)

*one patient may be given more than one type of therapy

Table 7. Distribution of follow-up visit and frequency of relapses observed in newly diagnosed atopic dermatitis patients at the Allergy and Immunology Division, Dermatology and Venereology Clinic, Prof. Dr. R. D. Kandou Hospital Manado from January 2019-December 2021

Follow-up visit frequency	Year			Total (%) (n=108)
	2019	2020	2021	
Once:	11	4	6	21 (19.4)
- Improvement	8	3	4	15 (71.4)
- No improvement	3	1	2	6 (28.6)
Twice:	5	1	2	8 (7.4)
- Improvement	4	1	1	6 (75)
- No improvement	1	0	1	2 (25)
≥ Thrice:	4	0	1	5 (4.6)
- Improvement	4	0	1	5 (100)
- No improvement	0	0	0	0 (0)
No Follow-up visit	21	28	25	74 (68.5)
Total	41	33	34	108 (100)
Relapses frequency				
- Once	3	1	2	6 (75)
- Twice	1	0	1	2 (25)
- ≥ Thrice	0	0	0	0 (0)
- Total	4	1	3	8 (100)

DISCUSSION

The prevalence of AD is relatively high. According to the World Allergy Organization 2018, AD in children is up to 30%, whereas in adolescents, it is lower at 10% of the world population. On the other hand, the number of children with AD in Indonesia is quite high at 23.7%.[9] From 2019-2021, there were 108 newly diagnosed atopic dermatitis patients at the Allergy and Immunology Division, Dermatology and Venereology Clinic, Prof. Dr. R. D. Kandou Hospital Manado. The visit rate decreased in 2020 due to the COVID-19 pandemic, which affected the number of patients who came to the outpatient unit in general. This can be seen from the record of patient visitation rates at the Allergy and Immunology Division, Dermatology and Venereology Clinic, Prof. Dr. R. D. Kandou Hospital Manado from 2013-2015, which there were 117 new patients.[9] Based on the sex ratio, female patients were higher than males at a ratio of 1,6:1; the total number of female patients was 67 (62%) and the total number of male patients was 41 (38%). In addition, there were 19.2% of AD patients, consisting of 80.9% females and 19.1% males, observed in college students in the Faculty of Medicine at Muhammadiyah Palembang University batch 2015-2018.[10] Likewise, female patients with AD in the Dermatology and Venereology Clinic, Dr. H. Abdul Moeloek Bandar Lampung Hospital, from 2018-2019 were higher than male patients with a ratio of 1.3:1. The total number of female patients was 76 (56.7%) and the total number of male patients was 58 (43,3%).[12] It aligns with a theory that states female is more prevalent in AD compared to male with a ratio of 1.3:1.[2] In this study, the majority of AD patients were individuals older than 12 years old, counting up to 60 patients (55.6%) from the total. A similar distribution was also shown by AD patients in Sentra Medika Cisalak Depok Hospital from July 2021 – January 2022, where 25 AD patients (59.5%) were adolescents (>12 years old).[12] The number of AD patients above 12 years old in Dr. H. Abdul Moeloek Lampung Hospital from 2018-2019 was even higher, counting up to 96 patients (71.6%).[11] The prevalence of AD in Southeast Asia varies, and as such, in Indonesia, AD patients in the age group of 13-14 years old are 1.1%.[4]

Based on the number of patients who visited the hospital, in 2019 and 2020 the highest recorded visit occurred in November with 7 patients (17.1%) and 5 patients (15.2%), respectively, and in 2014, January recorded the highest visit with 5 patients (14.7%). AD can be affected by a change in season.[2,8] It is thought that an intrinsic parasympathetic system abnormality in AD patients interferes with the thermo-regulatory function that predisposes to exacerbation of the

disease, which usually improves in summer and worsens in cold and dry winters. Sun exposure can cause the patient to feel hot, resulting in skin evaporation and excessive perspiration, which can also trigger skin irritation.[8] These factors are difficult to evaluate because,in addition to weather and season change, there are other factors that can affect water loss through the skin, such as physical activity, temperature, humidity, and the texture of clothing.

Based on Table 3 the major main complaint was itching, which was recorded in 67 patients (62%). Itching is the most common problem among AD patients. Scratching can cause lichenification, excoriation, and a damaged skin barrier. The majority of patients, 53 patients (49.1%), already had less than a month's worth of symptoms before seeking treatment. Severe symptoms can interfere with sleep and cause stress for the patient and their families. One of the factors that cause itching is an increase in TEWL and a decrease in water content in the stratum corneum.[1,3]

Itching when sweating was found in 42 patients (38.9%) and often recurring in 66 patients (61.1%) (Table 3). AD patients usually start to feel itching under conditions of sweating and high temperatures, and it is intermittent and chronic. Several studies have suggested a relationship between itching and sweating in AD patients, in which an increase in sweat production will affect the occurrence of pruritus in these patients.[2,13] This is related to the role of acetylcholine in the mechanism of sweat-induced itching.[14]

This study recorded 66 patients (61.1%) with a history of atopy and 42 patients (38.9%) with none. There were 41 cases of atopy in the patient's families (62.1%). Most cases of AD have hereditary factors. Some studies state that sometimes AD is not accompanied by other atopic diseases.[14,15]

AD was mostly triggered by food/drink, found in 68 patients (39.3%), followed by stress, found in 40 patients (23.1%) (Table 4). Triggering factors for AD are irritants, inhaled allergens, foods, microorganisms, stress, temperatures, and humidity. Food allergens facilitate AD by inducing IgE-mediated inflammation and increasing plasma histamine.[14] Likewise, AD in this study was mostly triggered by food. A study on double-blind placebo-controlled food challenges to milk, eggs, nuts, soy, flour, and fish showed that 90% of these foods can trigger AD recurrence. Diet or dietary restrictions that have been proven to cause allergies lead to clinical improvement in AD.[8] Twenty-eight patients (16.2%) were triggered by inhaled allergens, such as household dust and pollen, which increase the incidence of AD, as well as the habit of taking hot showers and showering for too long, which can aggravate AD.[13,14] Other triggering factors were seasons, found in 17 patients (9.8%) and wool, found in 1 patient (1.7%). Environmental factors can also modulate the effects of irritants, including temperature, humidity, and the texture of the fabric. The temperature at home and at work should be set at moderate humidity to minimize sweating. The clothing material used should not be rough or too thick, either.[8]

Based on the location and morphology of lesions, they are generally found in more than one area and in several types. Flexor regio lesions were found in the majority of patients (66, or 50.4%), and erythema was the most common type of lesion morphology, found in 81 patients (22%) (Table 5). The area location and morphology of lesions in AD are related to age or disease phase and the stage of disease development. In infants, the types of lesions are usually erythema, erosion, and crust; hence, they appear wet, especially on the scalp, face, and extensor parts of the extremities. Conversely, lesions in children are generally drier because they have a chronic form of lichenification, especially in the elbow and knee. AD lesions in adults are usually dry and lichenified, especially in the flexural areas.[2,13]

Hand dermatitis was recorded in 26 patients (33.%) (Table 5). Skin disorders on the hands, especially irritant contact dermatitis, were found in 45% of adults with a previous history of AD.[8,16] Hand dermatitis can be triggered by consistently wet skin, for instance, from washing with soap, detergent, or disinfectant. A similar situation can also be encountered in patients who have high water exposure frequencies at work; thus, hand dermatitis is difficult to cure and can interfere with their work. AD patients have lower thresholds for irritants such as soaps, detergents, acids, alkalis, dust, and water; therefore, these irritants should be avoided.[2,8,16]

In the management of AD patients, one can receive more than one type of therapy. Systemic therapy is usually administered to AD patients who are persistent, have extensive lesions, and are unresponsive to other therapies.[4,17] Antihistamines were the most common drugs for AD patients, prescribed to 108 patients (32.5%) in the form of cetirizine in 94 patients (87%) of all new AD patients (Table 6). This type of treatment was given with the possibility that AD patients may often have pruritus or itching, which was found in 67 patients (62%), and emollient treatment or other conservative therapies are inadequate, hence antihistamines were given, both sedative and non-sedative depending on the patient's condition. Although both sedating and non-sedating antihistamines show limited results in AD therapy, antihistamines can be administered to reduce pruritic

symptoms in AD sufferers if clinical symptoms of urticaria or rhinitis are prominent. AD patients with a sleeping disorder, which is a major problem, can be given sedating antihistamines, but this still does not replace topical therapy treatment.[17] Cetirizine is the most common type of antihistamine for AD. A preliminary study has demonstrated the benefits of cetirizine in eliminating signs and symptoms of AD in children at age 6-12 years old.[4,18] Cetirizine also demonstrates a steroid-*sparing* effect with a reduction in the duration of moderate or potent topical corticosteroid use from 25.2 days to 18.8 days.[15]

Methylprednisolone is the most widely administered systemic corticosteroid, recorded in 20 patients (71.4%) (Table 6). Some clinicians have expressed the benefit of short-term systemic corticosteroids for up to 6 weeks in combination with other modalities such as topical corticosteroids or calcineurin inhibitors. Long-term systemic corticosteroids should be avoided in the management of AD because of their high side effects and rebound effects. Systemic corticosteroids may be considered for short-term use in certain cases, for example, when other systemic regimens and phototherapy are being optimally administered.[17]

Oral antibiotics were recorded in 8 patients (2.3%) with erythromycin as the most widely administered drug, found in 4 patients (50%); meanwhile, other topical antibiotics were recorded in 17 patients (4.9%), prescribed in the form of natrium fusidate to 11 patients (3%) with pustules (Table 6). *Staphylococcus aureus* infection is a common complication in AD patients. It is estimated that *S. aureus* infects 90% of lesion areas and 75% of areas without AD lesions. The density of *Staphylococcus* in AD is associated with inflamed skin and the severity of the disease. Localized AD infections and fluid-filled lesions require anti-microbe therapy. Treatment with anti *staphylococcus* contributes to the success of AD management. Antibiotics may be given systematically or topically as a monotherapy or in combination with corticosteroids. They not only decrease microbe colonization, but many cases also mention improving AD.[4,20] Short-term, systematic antibiotics can be administered in severe cases or when there are signs of secondary infection (crust or pustules).[18] Systemic antibiotics are not given routinely to AD patients. 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.[19] Erythromycin or other macrolides can be suggested for penicillin-allergic patients.[3] Oral administration of erythromycin and cloxacillin in Indian children with AD has also shown a decrease in the number of microbe colonies in the eczematous skin and anterior nares.[19]

Emollients were frequently used in this study. Eighty-two patients (90.1%) were treated with petroleum jelly and 9 patients (9.9%) were treated with urea 10% cream (Table 6). Xerosis is one of the cardinal signs of AD and is the result of alterations in the filaggrin gene, which is responsible for the integrity of the skin barrier function.[13] Emollients are a mainstay in the management of AD with impaired skin barrier function.[4] It relieves xerosis and increases TEWL.[8] Emollients (glycol and glyceryl stearate), soy sterols lubricate and smooth the skin, act as occlusive agents (petrolatum, dimethicone, mineral oil), and form a layer that can prevent water evaporation, while humectants (glycerol, lactic acid, urea) attract and retain water in the skin.[4] Three randomized controlled trials (RCTs) have demonstrated emollients combined with active treatments such as topical corticosteroids can reduce corticosteroid cream consumption without aggravating the disease.[4] Emollients as a secondary treatment to topical corticosteroids provide a steroid-sparing alternative and minimize relapses.[19] Emollients may be used as the main therapy in a mild AD case and are recommended to always be included in moderate-to-acute AD.[4] It is best applied 2-3 times a day or when the skin starts to dry out. An adequate amount of emollient is 100-200 g/week for children and 200-300 g/week for adults. Emollient is applied all over the body within 5 minutes after showering or bathing, while the skin is still damp.[4,14] Emollient therapy also includes avoiding irritating cleansers and using appropriate soap substitutes and/or emollient additives when bathing.[4]

Topical steroids were prescribed to 86 patients (25.9%) mostly betamethasone 0.1%, recorded in 30 patients (34,9%) (Table 6). Topical corticosteroids have anti-inflammatory, immunosuppressive, vasoconstrictive properties and inhibit fibroblast activity.[9] The most frequent types administered were betamethasone 0,1% in 30 patients (34.9%), desoximetasone in 16 patients (18.6%), hydrocortisone 2.5% in 14 patients (16.3%), and clobetasole propionate 0,05% in 10. patients (11.7%) (Table 6). The prescription of topical corticosteroids should be adjusted according to the severity and location of AD lesions. Mild topical corticosteroids are recommended for mild AD with facial and neck lesions; medium potency for moderate AD; and strong potency for severe AD or severe recurrence.[19,20] Topical corticosteroids can be applied once or twice a day for

7-14 days in the case of acute relapse.[19] The finger-tip unit (FTU) measurement is used to determine the amount of topical corticosteroid to be applied, and it is easy to understand for both clinicians and patients. FTU is the amount of ointment that is removed from the tube with a 5 mm diameter hole, measured from the most distal fold to the tip of the finger. FTU is approximately equal to 0.5 grams and usually can cover the entire surface of 2 adult palms.[21]

Compresses with gauze moistened with normal saline were found in 8 patients (2.3%) (Table 6). This treatment can increase drug absorption, and by covering the lesion, it will reduce the frequency of scratching. It also hydrates and cools the skin. Besides, it reduces exudation and demonstrates similar results to using cream in mild to acute AD patients at the age of 4-27 months.[4]

Intermittent therapy, week-end therapy, and "hotspot" intermittent therapy (application of intermittent to the specifically targeted recurring area) are several treatment strategies related to the side effects of topical corticosteroids.[2,3] A few studies have also evaluated the use of topical corticosteroids with a common application technique by patients, for example, in the management of exacerbations with other treatment combinations such as emollients, moist compresses, and antibiotics. Concurrent use of occlusive dressings, moist compresses, and emollients may increase the percutaneous absorption of topical corticosteroids. Cream bases should be used for wet and inflammatory AD lesions, oil ointments for dry and lichenified lesions, and lotion bases are recommended for hairy areas.[4]

Education to patients plays a key role in the management of AD it includes a thorough explanation of the AD developmental journey (the pathogenesis of the disease in a common, easily understood term), the triggering of aggravating factors as well as symptoms-reducing factors, and short- or long-term therapy can modify and control the disease.[8] The benefits of patient education can be reflected in the number of patients in follow-up visits or the number of patients experiencing relapses. Different results in both categories may indicate patient education is being given optimally. Education should also include family members or caretakers, and they should be made aware that several combination modalities of therapies can facilitate recovery and the therapy process in general. Compliance is the key to successful AD therapy.[4]

There were 108 AD patients in Dermatology and Venereology Clinic, Prof. Dr. R.D. Kandou Hospital Manado from 2019-2021. Treatment with antihistamine and emollient therapy gave satisfactory results. The limitation of this retrospective study is the lack of analysis of the management and severity of AD on the patient's quality of life and its on the family's quality of life, which were not recorded in the medical record. More prospective studies are needed to compare the management and severity of AD with quality of life.

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