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Holistic Management in Adolescent Patients with Atopic Dermatitis Through Family Medicine Approach: A Case Report

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ABSTRACT
Atopic Dermatitis (AD) is a chronic, recurrent skin inflammation accompanied by itching and occurring in specific areas of the body. AD is often associated with other atopic diseases such as allergic rhinitis and bronchial asthma. It can affect individuals of all ages but is most common in infants and children. AD that appears in adolescents and adults is also increasingly recognized. This case report aims to explore the role of family physicians in the holistic and comprehensive management of AD in adolescents through a family medicine approach to prevent relapses and reduce the severity of AD. Data were obtained through auto-anamnesis, physical examination, and home visits. LAK, a 21-year-old final-year student, reported a red rash on her upper right arm for the past month, which she found very bothersome. Internal factors aggravating her symptoms included her mother's allergic rhinitis, the patient never using skin moisturizers, and not cleaning her body immediately after sweating. External factors included having to walk to campus through busy, hot, and dusty roads and the stress from her final-year thesis. Diagnosis and management were carried out holistically through patient-centered, family-focused, and community-oriented. The family medicine approach emphasizes prevention, patient education, and long-term management to reduce the severity of AD. Through a family medicine approach, changes in behavior, particularly in prevention, will occur, allowing AD to be managed and preventing relapses.

Keywords: *Adolescents, atopic dermatitis, family medicine, holistic management*

INTRODUCTION

Atopic Dermatitis (AD) is a chronic, recurrent skin inflammation characterized by pruritus, erythema, vesiculation, papulation, exudation, excoriation, xerosis, and sometimes lichenification, and it appears in specific body areas. AD is often associated with other atopic diseases such as allergic rhinitis and bronchial asthma. This condition can affect all ages but is most common in infants and children, with 45% of cases occurring in the first six months of life. AD has two forms: extrinsic and intrinsic. The extrinsic form occurs in 70-80% of patients and is marked by sensitization to environmental allergens and increased serum IgE levels[1,2,3]. Atopic dermatitis affects 10 to 20% of school-aged children[3]. Although this chronic condition often begins in the first few years of life and may persist into adulthood, adolescent and adult-onset disease are increasingly recognized[4].

A personal or family history of atopy, such as asthma, allergic rhinitis, or atopic dermatitis, can be a risk factor for developing AD in a child[5]. Regular use of emollients from birth can maintain the integrity of the skin barrier, preventing dryness and future AD[6].

This study is a case report with a holistic and comprehensive management approach through patient-centered family medicine. The study aims to promote sustainable behavioral changes to prevent the severity of AD

CASE PRESENTATION

LAK, a 21-year-old final-year student, complains of a very bothersome red rash on her upper right arm. The rash, which initially appeared a month ago as a 1 cm lesion, has expanded to 3 cm. The itching worsens especially when the patient sweats or feels stressed due to her final thesis. Scratching relieves the itching temporarily but causes the rash to spread and become redder (Fig. 1). The patient does not keep pets at home and uses antiseptic soap for bathing. Her menstrual cycles are regular, and she denies sudden mood changes or acne caused by hormonal changes.

To alleviate her symptoms, the patient has been using over-the-counter ointments from the pharmacy, which only provide temporary relief. She does not remember the name of the ointment used. Her mother frequently sneezes when exposed to cold air and dust, especially in the morning.

The patient, a final-year student burdened with many assignments, walks to and from campus for about 15

minutes each way. She rarely uses moisturizers or sunscreen and does not shower immediately after sweating. The patient swims or goes to the gym near her residence 1-2 times a week.

Fig.1 Photo on May 2, 2024 shows erythema, lichenification, and xerosis.

When asked about her illness experience, the patient believes the rash will persist and spread. She feels very disturbed by the skin rash, finding it hard to focus and perform activities when the itching flares up. She hopes for a quick recovery without recurrence.

Family Genogram is an assessment tool used in family therapy to illustrate family relationships and inherited behavior patterns across generations. It helps doctors identify behavioral patterns, health issues, and relationship dynamics that might affect the patient within the family context (Fig. 2).

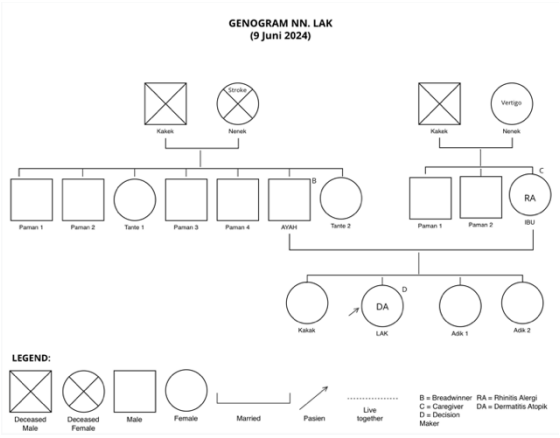

Fig. 2 Ms. LAK's Family Genogram with atopic dermatitis.

Family Mapping is a tool used in family therapy to visualize family structure and interaction patterns among family members. It depicts relationships and emotional dynamics within the family, aiding doctors in understanding patient and family interactions, identifying communication patterns, and potential conflicts, thereby designing appropriate interventions to improve family functioning and relationships (Fig. 3).

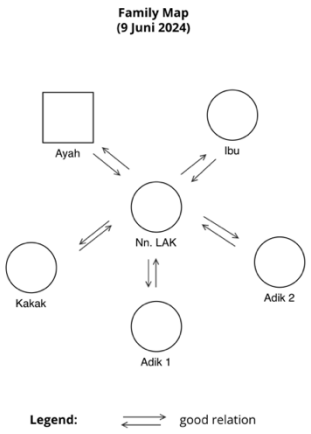

Fig. 3 Ms. LAK's Family Mapping with atopic dermatitis.

Structurally, the patient's family is a nuclear family consisting of father, mother, and child. According to Duvall's family development stages, they are at stage five: families with teenagers.

Family APGAR is an assessment tool used to evaluate family function in five domains: Adaptability, Partnership, Growth, Affection, and Resolve. It measures individual satisfaction with the support received from the family, scored as 0-3 (severely dysfunctional), 4-7 (moderately dysfunctional), and 8-10 (highly functional). The patient scored 9, reflecting less time spent with the family due to living away for studies.

Family SCREEM is an assessment tool to evaluate resources and abilities to handle stress or crises, encompassing Social, Cultural, Religious, Educational, Economic, and Medical aspects. Socially, the patient has two close friends at college and feels comfortable in her living environment. Culturally, she visits her parents' hometown every holiday. Religiously, she prays when her schedule permits. Educationally, she is in her final semester and is comfortable with her chosen major. Economically, her needs are met by her parents. Medically, a hospital is nearby, and she has health insurance.

Holistic Diagnosis considers personal aspects are the patient feels very bothered by the rash, worries it won't heal, and hopes for normal skin. Clinically, the diagnosis is atopic dermatitis. Internally, her mother has allergic rhinitis, and the patient never uses moisturizer or cleanses after sweating. Externally, the patient walks along busy, hot, and dusty roads to and from campus and feels stressed about her thesis. Functionally, she is at Grade 1, able to perform tasks as before the illness.

Comprehensive Management involves patient-centered, family-focused, and community-oriented care. Patient-centered management includes promotive consist of educating on regular moisturizer use, avoiding triggers like dust and irritants, and stress management. Preventive consist of advise using sunscreen, lukewarm baths with mild soap, and soft clothing. Curative consist of using topical corticosteroids or calcineurin inhibitors, antihistamines for severe itching, and regular emollient application. Consider

antibiotics for secondary infections and UVB phototherapy for severe cases. Rehabilitative consist of continuing emollient use to prevent relapse, learning relaxation techniques, and having regular family doctor consultations.

Family-focused management includes encouraging self-care and regular moisturizer use, maintaining cleanliness, emotional and psychological support during thesis work, ensuring emollient availability, and educating other family members on similar symptoms.

Community - oriented management includes using social media to remind regular emollient use, stress management, self-care, and identifying and avoiding triggers to prevent AD exacerbation.

DISCUSSION

Hill and Sulzberger classify AD into three phases, Infant Phase (0-2 years) consist of acute lesions (erythematous, papules, vesicles, erosion, oozing, crusts) mainly on cheeks, scalp, forehead, ears, neck, body. Lesions may extend to extremities with age. Child Phase (2 years-puberty) consist of subacute lesions (dry, erythematous plaques, scales, indistinct borders, exudate, crusts, excoriations) symmetrically distributed on flexural areas (wrists, ankles, antecubital, popliteal, neck, infragluteal). Adult Phase consist of chronic lesions (dry, erythematous papules/plaques, scales, lichenification) mainly on flexural folds, face, neck, upper arms, back, dorsal hands, feet, fingers, and toes[7].

The Hanifin-Rajka criteria diagnose atopic dermatitis, requiring three major criteria (pruritus, characteristic lesion distribution and morphology, chronic/relapsing dermatitis) plus three minor criteria (xerosis, ichthyosis, palmar hyperlinearity, keratosis pilaris, positive skin allergen test or elevated serum IgE, personal or family history of atopy, hand and foot dermatitis, eyelid dermatitis, keratosis pilaris, pityriasis alba, nipple dermatitis, keratoconus, anterior subcapsular cataracts). Additional tests include skin prick tests, atopy patch tests, total serum IgE, and skin scrapings[8].

A study by Ono et al. found that glucose concentration is significantly higher in the sweat of AD patients with exudative eczema or papules compared to those with chronic dermatitis, lichenification, and healthy subjects ($p<0.05$). The glucose concentration in sweat positively correlates with disease severity ($p=0.0154$). Researchers applied a glucose solution (33 mg/l) to mice, equivalent to the average glucose concentration in AD patient sweat, and observed its effects on repairing damaged stratum corneum. TEWL values increased significantly 30 minutes after tape stripping in the glucose-treated group[9]. High TEWL levels indicate a damaged skin barrier. The epidermis is crucial for maintaining homeostasis by regulating water loss through the skin[10].

Lonndahl et al's focus group study hypothesized psychological stress impacts eczema and itching, supported by all patients. They identified family issues, financial problems, excessive workload, school exam periods, lack of work structure, and unexpected events as key psychological triggers[11].

Barrier dysfunction in AD is due to increased protease activity in the stratum corneum. Emollients restore skin barrier integrity by combating dryness and reducing itching, extending the interval between flares, and decreasing the intensity of acute phases, thus reducing steroid use. Daily emollient use from birth can prevent AD in children[6].

Emollients should be liberally used, at least 250 g per week for adults. Products should have minimal ingredients, be fragrance-free, and without allergenic preservatives like parabens, ideally containing physiological lipids like ceramides. Cao et al's study showed significant reduction in skin redness (11.89%) and erythema index (5.68%) after 4 weeks of using ceramide-containing sunscreen. There was also a significant reduction in TEWL (22.96%) and increased skin hydration (21.96%) in the stratum corneum, with no adverse events[12].

Topical corticosteroids (TCS) have been the standard care since the 1950s, reducing skin inflammation and itching. "Steroid phobia" arises due to long-term use risks like local skin atrophy, telangiectasia, striae, perioral dermatitis, and acne, and widespread use risks systemic absorption affecting adrenal axis, linear growth, and bone density in children and adults[13].

Topical calcineurin inhibitors (TCIs) have been approved since 2000, with tacrolimus and pimecrolimus being approved in 2001 for intermittent use in patients who previously failed or have contraindications to topical corticosteroids (TCS). The American Academy of Dermatology guidelines recommend TCIs for both acute treatment and maintenance of atopic dermatitis (AD) because TCIs have minimal risk of skin atrophy and pigmentation changes, can reduce the need for TCS, have an excellent safety profile, and in long-term monitoring studies, there has been no evidence of a clinically significant increase in malignancy rates. TCIs are used when AD frequently recurs, TCS cannot be used, or to reduce the use of TCS in mild to moderate AD[14].

To maintaine the surrounding air moisture level from dropping below 10%, the use of a humidifier can be considered with a humidity output level between 45% and 60%. This can help keep the skin hydrated without needing to create an environment with excessively high humidity (70%). The goal is to maintain adequate moisture so that the skin does not become dry, without being excessive[15]. Further research is still needed to determine the benefits of humidifiers in preventing the severity of atopic dermatitis (AD).

CONCLUSION

Ms. LAK, a 21-year-old young adult with AD, has internal risk factors including a mother with allergic rhinitis, no use of emollients, and not cleaning herself immediately after sweating. External factors include walking to campus through hot, dusty, and busy roads and stress from final coursework.

Comprehensive and holistic management through family medicine includes patient-centered, family-focused, and community-oriented approaches. Patient-centered interventions cover preventive and promotive education on maintaining skin moisture with regular emollient use, avoiding triggers like dust and sweat, stress management, warm baths with gentle soap, and wearing soft, loose clothing. Curative measures recommend moderate-potency corticosteroids for severe itching and regular emollient use to restore the skin barrier. Rehabilitative measures include continued emollient use to prevent relapses, relaxation techniques for stress management, and regular family doctor consultations (Fig. 4-5).

Fig. 4 Photo on June 9, 2024 shows erythema has faded, xerosis has decreased, but lichenification remains.

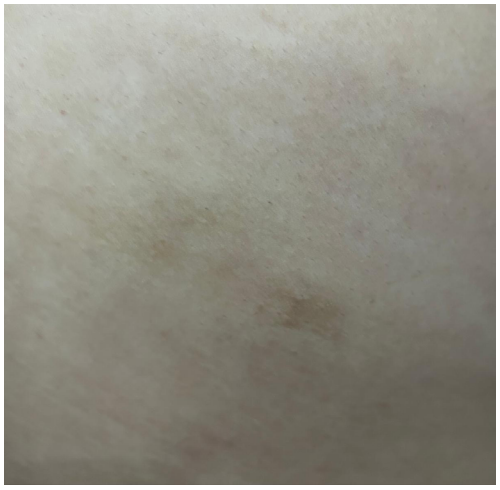

Fig. 5 Photo on July 10, 2024 shows no erythema, no xerosis, and lichenification has thinned.

Family-focused management involves reminding the patient to maintain personal hygiene and regular emollient use, ensuring a supply of emollients at home, maintaining home cleanliness, providing emotional and psychological support, and educating other family members if they experience similar symptoms. Community-oriented management uses social media to emphasize the importance of regular emollient use, stress management, personal hygiene, and avoiding triggers to prevent AD from worsening.

For managing adolescents with AD, family doctors can apply holistic diagnosis and comprehensive management not only to the patient but also to their family and community. This aims to prevent AD severity in the future and improve the quality of life for adolescent patients by providing more effective care and promoting sustainable behavioral changes.

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Author Contributions
AA contributed to manuscript writing. All authors read and approved the final manuscript. SM, MH provided expert opinions and reviews as family medicine consultants.

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Declarations

Consent for Participation
Consent was obtained from the adolescent patient in this case report.

Consent for Publication
Consent for publication was obtained from the case report participant.

Competing Interests
The authors declare no competing interests.

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