Successful alopecia universalis treatment with the combination of cyclosporine and oral corticosteroid: a case report

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ABSTRACT

Background: Alopecia universalis is an autoimmune condition on hair follicles with the characteristics of ovoid or round-shaped hair loss (focal) that develops into multiple hair losses and is the most severe form of alopecia. The pathogenesis of alopecia universalis is unclear. However, the most accepted hypothesis is based on the immunologic factor, especially T-cell mediated autoimmune process.

Case: A 19-year-old male Indonesian complained of hair loss all over his body. Efflorescence of the whole body showed an alopecia patch. The Severity of Alopecia Tool (SALT) score showed 100%. Skin dermoscopy indicated yellow dots. The patient was given 8 mg of intraoral methylprednisolone every 8 hours and 100 mg of intraoral cyclosporine every 12 hours for four weeks and slowly tapering off. The patient experienced acneiform eruption and was topically treated with 2% sulfur lotion morning, especially during cold weather.

Conclusion: Alopecia universalis is rare and can cause significant damage and psychological pressure to the affected individuals. Treatment with corticosteroid and cyclosporine resulted in good therapy response.

Keywords: Alopecia, alopecia universalis, alopecia areata, SALT.


INTRODUCTION

Alopecia universalis and totalis is the severe clinical form of alopecia areata. Alopecia areata is an autoimmune disease of the hair follicles, marked by ovoid or round-shaped hair loss (focal), and can develop into multiple hair losses. Around 5% of alopecia areata cases develop into alopecia totalis, marked by the total hair loss on the scalp. Meanwhile, around 1-2% of alopecia areata cases can develop into alopecia universalis, marked by the total hair loss on the scalp and body.

Alopecia areata occurs in all populations in the world. The prevalence in the US is around 0.1%. Meanwhile, the prevalence for alopecia totalis and alopecia universalis is around 0.08%. Based on the visit data of the cosmeceutical polyclinic of Sanglah General Hospital from January 2018 to March 2022, there were 14 alopecia areata cases and two alopecia universalis cases. In general, alopecia areata can affect males and females with similar proportions. However, several studies showed that the male gender predominates in adults.

The cause of alopecia universalis is still not known for certain. Persistent alopecia universalis causes significant damage and psychological pressure to the affected individuals. Other than that, there has not been any therapy that can provide maximum results. The pathogenesis of alopecia universalis is unclear. However, the most accepted hypothesis is based on an immunological factor, especially T-cell mediated autoimmune process. Therefore, oral cyclosporine therapy has been widely used with different response levels for each individual. However, systemic corticosteroids are also said to support hair regrowth in alopecia areata by utilizing immunosuppressive effects.

The following reported a case of alopecia universalis in a male patient who was given a combination therapy of oral cyclosporine and systemic corticosteroid. This case was reported because alopecia universalis rarely occurs, thus becoming a challenge for clinicians to establish a diagnosis and provide treatment.

CASE DESCRIPTION

A 19-year-old male Balinese visited the Dermatology and Venerology Outpatient Clinic of Sanglah General Hospital with the main complaint of hair loss all over his body. It appeared suddenly, started with itchiness, followed by hair loss. The hair loss started from the lower extremities’ region, then rapidly developed within two weeks into hair loss throughout the body. The patient said that previous hair growth was normal. He had no habit of pulling hair. The patient had no history of nail damage, patches on numb skin, red patches on the skin, and redness on the face when exposed to the sun. The patient also had a history of sneezing in the morning, especially during cold weather.
or dusty air, which he experienced at three years old. He also had a history of dry skin since childhood and often felt itchy.

He never used traditional oil on his head and body. He visited a dermatology and venerology specialist within the last year and was given 10 mg of cetirizine tablet every 24 hours and 0.5% of topical betamethasone cream every 12 hours. The patient reported that the complaint showed no improvement during treatment. He had no history of systemic diseases such as thyroid, cardiovascular, malignancy, or drug allergy.

The patient is the second child of three siblings. Both siblings had no similar complaints. The patient's mother was reported to have a history of asthma. There was no history of systemic diseases in the family, such as thyroid disorder and malignancy. Regarding social history, the patient is a student who has dropped out of school since he suffered from this disease. He was embarrassed to face his school friends, so he dropped out. Currently, the patient helps his parents sell drinks at home. Vital signs and general status were within normal limits. Dermatological status on all body locations showed efflorescence of alopecia patches (Figure 1a-j). The Severity of Alopecia Tool (SALT) score showed 100%.

Based on history taking and physical examination, the differential diagnosis for the patient was alopecia universalis and trichotillomania. Scalp dermoscopy revealed yellow dots (Figure 2a-2b). The adjunctive examination was also carried out to determine the underlying disease, such as thyroid disease and anemia. TSH examination showed 0.45 IU/ml (0.27-4.2 IU/ml) and ferritin level was 58.31 ng/ml (6-67 ng/ml). Complete blood count, liver function, and kidney function were within normal limits.

Based on history taking, physical examination, and adjunctive examination, the patient was diagnosed with alopecia universalis. The patient was given the treatment of 8 mg of oral methylprednisolone tablet every 8 hours and 100 mg of intraoral cyclosporine tablet every 12 hours. The patient was also given counseling, information, and education concerning disease course, how to use the medicine, side effects, and routine follow-up.

Day 28 observation showed an acne-like lesion on the body for a week. On the scalp, the anterior and posterior thoracoabdominal region showed efflorescence of skin-colored oval or round, well-defined multiple papules with a diameter of 0.3-0.5 cm, discretely spread, and without comedones. The Severity of
Alopecia Tool (SALT) score showed 91%. According to dermoscopy, the scalp and eyebrow regions showed blackish yellow vellus hair growth. The patient experienced alopecia universalis accompanied by acniform eruptions. The patient was given 8 mg of intraoral methylprednisolone every 12 hours (tapering off), 100 mg of intraoral cyclosporine tablet every 12 hours, and 2% topical sulfur lotion every 12 hours on papules.

Day 51 observation indicated more hair growth on the eyebrows, head, and body. The patient had no complaint of hair loss. He still felt acnes, albeit reduced. The patient did not feel nauseous or had an increase in appetite. He had no problem eating, drinking, or urinating. Vital signs and general status were within normal limits. The alopecia location showed black hair growth measuring 0.8 cm long (Figure 3a-e). The anterior and posterior thoracoabdominal regions showed yellowish vellus hair growth (Figure 3f-g). However, no hair growth was found in the regions of the superior and inferior right and left extremities (Figure 3h-k). The scalp and anterior and posterior thoracoabdominal region showed an efflorescence of skin-colored ovoid-round well-defined multiple papules measuring 0.3-0.5 cm in diameter, discretely spread, and without comedones. The severity of Alopecia Tool (SALT) score was 40%. Dermoscopy on the scalp and eyebrows showed black terminal hair growth. The diagnosis was alopecia universalis follow-up (improved) and acniform eruptions. Treatment was continued with 4 mg of intraoral methylprednisolone every 12 hours (tapering off), 100 mg of intraoral cyclosporine tablet every 12 hours, and 2% topical sulfur lotion every 12 hours on papules.

**DISCUSSION**

Alopecia areata is a common autoimmune disease of the hair. Around 5% of alopecia areata patients can experience whole scalp hair loss (alopecia areata totalis), and 1%-2% of alopecia areata patients can experience whole body hair loss (alopecia areata universalis). This case reported a 19-year-old male patient who complained of a sudden onset of hair loss for three years. The patient stated that hair loss first occurred in the legs and rapidly developed into whole body hair loss within two weeks. There was no family history of similar complaints.

The pathogenesis of alopecia areata is highly affected by auto-active CD8 cytotoxic T-cells (affected hair follicles and nails) and by immune response affected by interferon-γ (comprises of interferon-γ and other chemokines induced by interferon-γ). Several risk factors include autoimmunity conditions (atopy, vitiligo, lichen planus, morphea, Hashimoto thyroiditis, pernicious anemia, diabetes mellitus), genetic (related to HLA-A1, HLA-B62, HLA-DQ1, HLA-DQ3, and non-HLA molecules such as major histocompatibility complex class I chain-related gene A). It is also related to mood disorders such as stress, depression, anxiety, post-acute disease, drugs, systemic diseases, hormones, and nutrition deficiency. Several studies found the existence of CD8+ cytotoxic T-cells subset NKG2D+ (natural-killer group 2 member D-positive) in inflammatory infiltrates of alopecia areata and an increase of 2 NKG2D ligands in hair follicles. Other types of cells, such as natural killer cells, may also play a role in alopecia areata as alopecia areata regulator.

One of the risk factors of alopecia areata is atopic condition. Around 10% to 60% of patients with atopic diseases such as asthma, atopic dermatitis, and rhinitis allergy were reported to have alopecia areata. Patients with atopic history had a 24% risk of developing totalis and alopecia universalis. Meanwhile, Sung et al. concluded that patients with a history of atopic in the respiratory tract, such as rhinitis allergy, had a higher risk of developing alopecia areata than asthma patients.

The relationship of both can be associated with immunology potential mediated by T-cells that are targeted against hair follicle autoantigen. Atopic diseases occur because of the Th2 cytokine pathway, including IL-4, IL-5, IL-13, and IL-31. Meanwhile, alopecia areata patients showed an increase in plasma circulation and Th1 cytokine lesions, such as interferon-γ and IL-2, and an increase in IL-3 and IL-7, which showed that the pathogenesis of autoimmunization is multifactorial. Furthermore, alopecia areata and atopic disease have a Th2 cytokine pattern with an increase in IgE level, antibodies, mast cells, and eosinophils. Th2/IL-4 cells can stimulate the production of IL-5. In this case, the patient had a history of rhinitis allergy from when he was three years old. The patient’s mother also had a history of asthma. This patient's atopic history can be a risk factor for alopecia universalis. The patient also said he dropped out of school because he was embarrassed about his condition. This can cause stress that can aggravate the patient's condition.

Possible adjunctive examinations to help diagnose are dermoscopy, blood tests, and biopsy. Dermoscopy examination will show several variations that show the degree of severity of the disease. In general, alopecia areata will show black dots, yellow dots, exclamation mark hairs, broken hairs, and cadaver hair (the rest of the hair shaft is visible as a black dot in the follicular ostia). Black dots and exclamation mark hairs are specific findings that show disease course, while yellow dots can be associated with disease severity. Yellow dots show keratinous plugs and empty hair follicles that swell and are filled with sebum and keratin. Dermoscopy usually shows a point or whitish-yellow to yellow-pinkish polycystic with various sizes and uniform colors. Bains et al. stated that yellow dots are always found in alopecia universalis and alopecia totalis.

Patch-type alopecia areata will show more broken hairs.

Meanwhile, trichotillomania will show a dermoscopy result of reduced hair thickness, shortened vellus hair, broken hair with different shaft lengths, rounded hair, trichoptilosis, and rare yellow dots. This case only included dermoscopy and laboratory tests. Skin dermoscopy showed yellow dots. Thyroid hormone and ferritin tests were within normal limits. From history taking, physical examination, and adjunctive examinations, the patient was diagnosed with alopecia universalis.

Based on American National Alopecia Areata Foundation, the degree of severity of alopecia areata is classified into S1 (<25% of scalp involvement), S2 (26% to 50%), S3 (51% to 75%), S4 (76% to 99%), and S5 (100%, alopecia totalis and alopecia
A case of alopecia universalis in a 19-year-old male patient is reported. The diagnosis was based on history taking, physical, and adjunctive examination. History taking and physical examination showed hair loss throughout the body. Scalp dermoscopy showed yellow dots. The patient was given a combination therapy of methylprednisolone and cyclosporine. The Severity of Alopecia Tool (SALT) score was 100%. Fifty-one days of observation revealed terminal hair growth on the scalp, eyebrows, eyelashes, and vellus hair on the body. The prognosis of this patient was poor because alopecia universalis has a high relapse risk.

ETHICS IN PUBLICATION

The patient received informed consent and agreed to share his medical history and clinical image for publication.

CONFLICT OF INTEREST

The authors declared no conflict of interest regarding the publication of this article.

AUTHORS CONTRIBUTIONS

Author IGND contributes to patient treatment, manuscript preparation and submission. Author PSWT, PAYR, and PAM contribute to the literature review, patient examination and follow-up, manuscript preparation, and translation.

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REFERENCES
