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REDUCTION OF SEBORRHOEIC DERMATITIS AREA SEVERITY INDEX IN INFANTILE SEBORRHEIC DERMATITIS WITH MALNUTRITION: A CASE-BASED OBSERVATION

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ABSTRACT
Infantile seborrheic dermatitis is a common chronic inflammatory skin disorder that causes erythema and scaling on the scalp, face, and skin folds. Malnutrition in newborns can affect skin integrity and immunological responses, worsening seborrheic dermatitis symptoms. The Seborrhoeic Dermatitis Area Severity Index (SDASI) evaluates disease severity based on the size and intensity of lesions. This case report aims to describes infantile seborrheic dermatitis in a malnourished newborn who improved significantly clinically after topical medication, as measured by the SDASI. A one-month-old boy child presented with thick, yellowish scales and erythema on the head and right temporo-occipital area that had appeared one week before hospital admission.The patient was diagnosed with infantile seborrheic dermatitis and severe malnutrition (weight-for-age z-score < -3 SD per WHO growth criteria). The first SDASI score was 4. The pediatric department provided nutritional rehabilitation, while the dermatology department provided a topical corticosteroid (desoximetasone 0.25%) and emollients. During the second week of clinical exams, the SDASI score dropped to 0.2. This example demonstrates that combining nutritional support with topical therapy can lead to significant clinical improvement in infantile seborrheic dermatitis, as seen by a significant drop in SDASI score. SDASI is a valuable objective metric for monitoring sickness progression and therapy response in comparable scenarios.

Keywords: malnutrition; seborrheic dermatitis; seborrhoeic dermatitis area severity index

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INTRODUCTION

Infantile seborrheic dermatitis, also known as cradle cap, is a persistent papulosquamous skin condition that affects sebaceous gland-rich areas such as the face, head, ears, upper trunk, and flexural regions. This disorder is identified by the presence of greasy, yellowish scales on the infant's scalp (Suh et al., 2019; Dewi, 2022). The incidence is highest in three age groups: infancy (between 2 weeks and 12 months), adolescent, and adulthood (30 to 60 years of age) (Suh et al., 2019).

The etiology of seborrheic dermatitis is multifaceted and includes Malassezia yeast infestation, hormonal factors, sebum secretion, and immunological responses. The immune system is crucial in symptom development, especially in immunocompetent people (Adalsteinsson et al., 2020; Córdoba et al., 2021). The SDASI examines three anatomical areas: the scalp, face, and chest. Local area ratings are based on the percentage of afflicted skin, and severity is graded as mild (0-7.9), moderate (8-15.9), or severe (>16) (Alizadeh, 2014).

Nutritional status plays a vital role in maintaining skin integrity and immune function. Malnutrition in infants can impair skin regeneration, reduce mucocutaneous immunity, and

alter the skin microbiome, ultimately aggravating the manifestations of seborrheic dermatitis. In this context, clinical evaluation of lesion severity is crucial for assessing disease progression and treatment response (Adalsteinsson et al., 2020).

Seborrheic dermatitis is a chronic condition that, in some cases, may require long-term treatment. Therefore, the selection of therapeutic modalities with optimal efficacy and tolerable side effects is essential. Treatment aims to reduce visible signs, pruritus, and erythema (Clark et al., 2015). This case report aims to enhance understanding of the relationship between severe malnutrition and the clinical manifestations of infantile seborrheic dermatitis, as well as to evaluate improvements in skin condition through a decrease in SDASI score following nutritional intervention and topical therapy.

METHOD

This article is a case report that presents the diagnosis, clinical management, and follow-up care of a patient. Data for this case were obtained through anamnesis, physical examination, and relevant supporting investigations conducted at Adam Malik General Hospital, Medan. The collected data were analyzed qualitatively and are presented in a narrative format. This report discusses a 1-month-old male infant diagnosed with infantile seborrheic dermatitis and severe malnutrition. The case focuses on identifying associated risk factors, analyzing the clinical course, and is intended to provide insights for clinical practice—particularly in the assessment of disease improvement using the SDASI.

CASE REPORT

A 1-month-old male infant was referred by the Department of Pediatrics to the Department of Dermatology and Venereology at Adam Malik General Hospital, with complaints of erythematous patches and thick yellowish scales on the scalp that had developed over the past week. Initially, small red patches appeared when the patient was 3 days old, which gradually expanded and were accompanied by progressively thickening scales. The patient was admitted under the care of the Pediatric Department with the following diagnoses: suspected Down syndrome, acute gastroenteritis, mild to moderate dehydration, and marasmus.

On physical examination, the patient appeared lethargic with decreased consciousness. His body weight was 2300 grams and body length was 50 cm, corresponding to a weight-for-age index of < -3 SD based on the WHO growth chart, indicating severe malnutrition. His heart rate was 120 beats per minute, respiratory rate was 40 breaths per minute, and body temperature was 36.5°C. Dermatological examination revealed erythematous macules with thick yellowish scales on the scalp, particularly in the right temporal and occipital regions (Figure 1). The SDASI score was calculated as (E+P+S) x Local Area Score = (3+2+3) x 0.5 = 4, indicating mild severity.

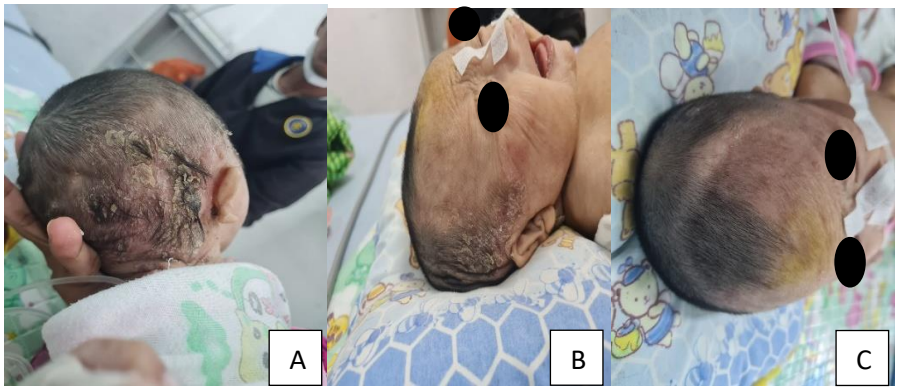

Figure 1. Initial consultation. Erythematous macules with thick yellowish scales are observed on the scalp and right temporal and occipital regions (A, B, C).

The differential diagnoses considered were seborrhoeic dermatitis, tinea capitis, and psoriasis vulgaris. A scalp skin scraping examination with 10% potassium hydroxide (KOH) was performed and yielded a negative result. The final diagnosis was seborrhoeic dermatitis (cradle cap). The patient was managed with the application of baby oil (containing mineral oil) to the scalp twice daily. Additionally, topical desoximetasone 0.25% combined with fusidic acid cream was applied to the scalp twice daily. Nutritional, dehidration, and gastroenteritis management for the patient continued under the care of the Department of Pediatrics.

At the 7-day follow-up, erythematous patches had significantly decreased and the scales had resolved. The patient's body weight had increased to 2400 grams, with a body length of 50 cm (weight-for-age index < -3 SD according to the WHO growth chart). Dermatological examination showed no erythematous macules or scales on the scalp and right temporal region (Figure 2). Topical treatment with desoximetasone 0.25% and fusidic acid cream was discontinued. Nutritional intervention was continued by the pediatric department. The SDASI score was recorded at 0.2. The prognosis for this patient was assessed as *quo ad vitam* dubia ad bonam, *quo ad functionam* dubia ad bonam, and *quo ad sanationam* dubia ad bonam.

Figure 3. One-week follow-up after treatment. No erythematous macules or scales were observed on the scalp and right temporal region

DISCUSSION

Seborrheic dermatitis is a chronic, relapsing inflammatory skin condition characterized by well-demarcated erythematous macules or plaques with greasy yellow-white scales accompanied by pruritus. This condition commonly affects sebaceous gland-rich areas such as the scalp, eyebrows, glabella, nasolabial folds, postauricular areas, and intertriginous regions (Suh, 2019; Adalsteinsson et al., 2020). Seborrheic dermatitis has a bimodal incidence, occurring first during infancy and childhood (infantile seborrheic dermatitis), and later during puberty, with a peak incidence between the ages of 30 and 60 years. The incidence is also higher among immunocompromised patients, ranging from 30% to 83% (Suh, 2019; Adalsteinsson et al., 2020).

Clinically, seborrheic dermatitis presents as scaly erythematous macules or plaques, often accompanied by itching. It typically involves areas with abundant sebaceous glands such as the face, scalp, ears, upper trunk, and flexural areas (inguinal, inframammary, and axillary). There is no specific ancillary test required to diagnose seborrheic dermatitis. However, if the diagnosis is uncertain, a skin scraping examination with 10% potassium hydroxide (KOH) staining can be performed to rule out fungal infection (Suh, 2019). In the present case, skin scraping with 10% KOH revealed no hyphae or spores, thus excluding the differential diagnosis of tinea capitis.

The severity of seborrheic dermatitis is assessed using the Seborrhoeic Dermatitis Area Severity Index (SDASI). Evaluation is performed on three anatomical areas: the scalp, face, and chest. The local area score is determined based on the percentage of affected area: 1 = ≤10%, 2 = 11–30%, 3 = 31–50%, 4 = 51–70%, and 5 = >70%. The severity of erythema (E), papules (P), and scales (S) is also graded as follows: 0 = none, 1 = mild, 2 = moderate, and 3 = severe. The SDASI for each area is calculated using the formula: (E + P + S) × local area score. SDASI severity is classified as mild (0–7.9), moderate (8–15.9), and severe (>16). In this case report, the SDASI score was determined according to this method (Sarac & Kocaturk Goncu, 2022).

On physical examination, the patient weighed 2300 grams and measured 50 cm in length, with a weight-for-age z-score (WAZ) below -3, indicating severe malnutrition. Malnutrition is associated with an immunocompromised state, which increases susceptibility to infections and is considered a risk factor for seborrheic dermatitis (Suh, 2019; Adalsteinsson et al., 2020; Victoire et al., 2019). Infantile seborrheic dermatitis is a common inflammatory skin condition in infants, particularly affecting areas rich in sebaceous glands such as the scalp, face, and skin folds. This condition is multifactorial in nature, involving the proliferation of *Malassezia* fungi, immune dysregulation, and sebum production. In the context of malnutrition—especially in infants and young children—there is a decline in skin barrier integrity due to deficiencies in protein, zinc, B-complex vitamins, and essential fatty acids, all of which are critical for epithelial regeneration and a healthy immune response. Studies have shown that malnourished children are more susceptible to skin colonization by microorganisms and chronic skin inflammation, including severe forms of seborrheic dermatitis that are refractory to standard therapies. (Orozco-Covarrubias L et al., 2011)

An immunocompromised state facilitates increased colonization of Malassezia species (formerly *Pityrosporum*), with *M. restricta* and *M. globosa* being the predominant species on sebum-rich skin. *Malassezia* secretes lipases that lead to the formation of free fatty acids and lipid peroxides, which trigger an inflammatory response. The immune system subsequently releases cytokines such as IL-1α, IL-1β, IL-2, IL-4, IL-6, IL-8, IL-10, IL-12, and TNF-α, disrupting the skin barrier and resulting in clinical manifestations such as erythema, pruritus, and scaling (Adalsteinsson et al., 2020; Alwarawrah et al., 2018). Prolonged immobilization also contributes to increased sebaceous gland activity in the scalp. Increased sebum production enhances *Malassezia* activity, and malnutrition further exacerbates its proliferation (Adalsteinsson et al., 2020). Therefore, malnutrition may exacerbate the severity of infantile seborrheic dermatitis and impair the skin healing process, highlighting the importance of a multidisciplinary approach in its management. (Almuntairi N et al., 2023 ; Banda K et al., 2024)

The management of infantile seborrheic dermatitis (ISD), commonly known as cradle cap, is generally conservative because the condition is usually benign and tends to resolve spontaneously within the first few months of life. First-line therapy includes the use of emollients such as white petrolatum or mineral oil to soften the scales, followed by gentle brushing and washing with a non-irritating baby shampoo. If these measures are insufficient, topical therapy becomes an option. Topical antifungals, such as ketoconazole 1–2% or miconazole 2%, are effective in reducing *Malassezia* fungal colonization, which plays a role in the pathogenesis of ISD. Mild topical corticosteroids, such as 1% hydrocortisone, may be used short-term to reduce inflammation, especially in skin fold areas. For more resistant cases or involvement of sensitive areas such as the face and intertriginous regions, calcineurin inhibitors (e.g., pimecrolimus) can be considered as an alternative, although their use should be cautious due to potential systemic side effects. This entire approach should be tailored to

the severity, lesion location, and the infant's age, and should always be supervised by healthcare professionals if there is no improvement after four weeks of initial conservative treatment. (DermNet NZ, 2025 ; . Crăiniceanu Z et al., 2024)

The use of mild topical corticosteroids, such as 1% hydrocortisone, may be considered to manage inflammation; however, caution is necessary because the skin of infants with marasmus tends to be thinner and more fragile (Schwartz, 2006). Meanwhile, marasmus, a form of severe protein-energy malnutrition, causes extreme weight loss, atrophy of adipose and muscle tissues, and immune system impairment (Patel et al., 2024). Nutritional rehabilitation should include the provision of high-energy and high-protein foods such as Ready-to-Use Therapeutic Foods (RUTF), as well as supplementation with essential micronutrients like vitamin A, zinc, and essential fatty acids (Carroll, 2020; Collins et al., 2006). Adequate nutrition plays a crucial role in skin regeneration and enhancing immune defense, thereby accelerating recovery from infantile seborrheic dermatitis (WHO, 2013).

CONCLUSION

Infantile seborrheic dermatitis, also known as cradle cap, is a chronic papulosquamous skin disorder that affects areas rich in sebaceous glands, such as the face, scalp, ears, upper trunk, and flexural regions (inguinal, inframammary, and axillary). The severity of seborrheic dermatitis can be assessed using the SDASI. Malnutrition, or poor nutritional status, is associated with an immunocompromised condition, which constitutes one of the risk factors for the development of seborrheic dermatitis.

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