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The Impact of Diet on the Course of Seborrheic Dermatitis: A Narrative Review

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Abstract

Seborrheic dermatitis (SD) is a chronic, recurrent inflammatory skin condition whose pathogenesis is associated with, among other factors, disturbances in the skin microbiome, overgrowth of *Malassezia* fungi, skin barrier dysfunction, and an abnormal immune response. The condition affects approximately 5% of the population and significantly impacts patients' quality of life.

The aim of this study was to analyze the available scientific data on the impact of daily diet on the course of seborrheic dermatitis and to identify foods that may alleviate or exacerbate the symptoms of the disease. A literature review covering the years 2016–2026 was conducted using the PubMed, Google Scholar, and Medline databases. The analysis included original articles, review articles, systematic reviews, and case reports concerning the relationship between diet and the course of seborrheic dermatitis.

Available studies indicate that diet may influence the severity of skin lesions. A diet rich in fruits and vegetables has been shown to have a beneficial effect. In contrast, the consumption of alcohol, highly processed foods, sweets, fried foods, and spicy foods has been linked to a higher frequency or greater severity of symptoms.

In summary, a well-balanced diet can play a significant role in supporting the treatment of seborrheic dermatitis and can help reduce the number of flare-ups and improve patients' quality of life. Given the limited number of studies and the inconclusive results, further research is needed to develop detailed dietary recommendations for people with seborrheic dermatitis.

Aim of the study: This narrative review aims to use available data to demonstrate how daily diet affects the course of seborrheic dermatitis and to identify foods that exacerbate or alleviate the condition.

Materials and Methods: Together with our team, we analyzed the PubMed, Google Scholar, and Medline databases. We searched the databases using specific keywords such as “diet,” “seborrheic dermatitis,” and “treatment.” The time frame covered by this narrative review spans the years 2016 to 2026. The most recent literature search was conducted on March 30, 2026. During the search, we focused in particular on articles, systematic reviews, narrative reviews, and case reports that addressed the impact of daily diet and specific foods on the course of seborrheic dermatitis.

Keywords: diet, seborrheic dermatitis, treatment

Introduction:

What is seborrheic dermatitis?

Seborrheic dermatitis is a chronic inflammatory condition characterized by papules and scaling, presenting as itchy, red patches and excessive keratinization of the epidermis. The clinical presentation of seborrheic dermatitis may vary depending on the location of the lesions, the patient’s age, and skin color. Most commonly, the condition manifests as symmetrical, red, greasy patches covered with yellowish scales. Patients often experience persistent itching, particularly when lesions affect the scalp and ears. In patients with darker skin tones, seborrheic dermatitis may be accompanied by irregular pigmentation changes, including both hyperpigmentation and hypopigmentation. There is also an infantile form of the disease, which is usually temporary and resolves spontaneously. Skin lesions in infants most commonly affect the scalp and present as extensive, greasy, yellow scales without accompanying itching. To a lesser extent, they affect other areas of the body. In cases where the course is chronic, a more persistent and generalized form of the condition may develop. The diagnosis of seborrheic

dermatitis is based primarily on clinical evaluation and can be made based on the characteristic location of the lesions and their morphology [2, 5, 20].

Prevalence

Seborrheic dermatitis is a chronic condition that, according to a meta-analysis published in 2024, affects approximately 4.38% of the population. The prevalence among adults was 5.64% compared to the prevalence of seborrheic dermatitis in the general population. In children older than one month, it was 3.70%, while in newborns it was 0.23% [12]. It is characterized by recurrent skin lesions in areas with an increased number of sebaceous glands, which produce and secrete sebum. Areas particularly affected by seborrheic dermatitis include the scalp, the face, especially along the nasolabial folds, the area behind the ears, and the forehead, the anterior chest, the armpits, the back, and the genital area [2, 4, 5]. There are two age groups that exhibit a higher incidence rate compared to the general population. The first age group consists of infants, while the second consists of adults. Statistically, seborrheic dermatitis is more prevalent among men than women in the adult population. The peak incidence in men occurs between the ages of 20 and 40 [2]. Incidence in infants is concentrated mainly in the first 3 months of life. Adults have a higher prevalence of seborrheic dermatitis compared to children [11]. Additionally, after reviewing articles on seborrheic dermatitis, one must not overlook young adults entering puberty. Puberty is associated with increased activity of the sebaceous glands and increased sebum production, which contributes to the development of seborrheic dermatitis in this group [16].

Pathophysiology of Seborrheic Dermatitis

The pathophysiology of seborrheic dermatitis is complex and multifactorial. Several key components that contribute to the development of the condition and are cited in numerous sources can be identified. These include changes in the skin microbiome, skin barrier dysfunction, and dysregulation of the immune response. An abnormally modulated immune response consequently leads to the development of skin inflammation [11, 16].

Fungi of the genus *Malassezia*

The human skin is home to many microorganisms that make up the skin microbiome. Disruptions within the microbiome often contribute to the overgrowth of *Malassezia* fungi, which normally reside on the skin's surface. There are eight species of *Malassezia* fungi found

on human skin. The most common species are *M. restricts*, *M. globosa*, and *M. furfur* [16]. According to an analysis of available studies, the skin of patients with seborrheic dermatitis is dominated in particular by the species *Malassezia restricts* and *Malassezia globosa*. Yeasts of the genus *Malassezia* are primarily found in areas of the skin rich in sebaceous glands. The largest clusters of fungi can be observed in specific areas of the human body, such as the scalp, face, front of the chest, armpits, back, and groin. This is due to the presence of a large number of sebaceous glands in these locations [4, 11, 14]. Depending on the geographic region, there are differences in the prevalence of specific species. *Malassezia restricts* was the most common species in the United States, South Korea, and Bosnia and Herzegovina, while *Malassezia globosa* was the most common in Japan, Greece, Serbia, and Iran [10]. The presence of *Malassezia* fungi on the skin surface does not directly contribute to the development of seborrheic dermatitis, as they occur physiologically on the human skin surface and are its natural commensals [11]. The aforementioned fungal species are organisms that require fatty acids for their growth. They are unable to synthesize fatty acids on their own, which is why they colonize the skin surface, which is the richest source of these substances. Through enzymes, primarily lipase and phosphatase, they break down the lipids contained in sebum. Some of the products of lipid degradation can initiate an inflammatory process in the skin and contribute to excessive proliferation of the epidermis. Additionally, in individuals with seborrheic dermatitis, commensal microorganisms may contribute to the formation of reactive oxygen species and lipid peroxides [11, 14, 16].

Microbiome

The skin microbiome in patients with seborrheic dermatitis and dandruff was analyzed and included in a systematic review by Rong Tao et al. published in 2021. An analysis of 12 studies revealed a predominance of fungi of the genus *Malassezia*, particularly the species *M. restricta* and *M. globosa*. An increased abundance of other fungal genera was also observed in patients with seborrheic dermatitis. The aforementioned systematic review included 9 studies focusing on the bacterial microbiome. The data indicate an imbalance among specific groups of microorganisms. An increased proportion of bacteria of the genera *Staphylococcus* and *Streptococcus* was noted, accompanied by a decrease in the abundance of *Cutibacterium* within the lesions compared to unaffected skin, where their proportion is often higher. Analysis of the study suggests that the composition of the microbiota may vary depending on the severity of

the disease and the location of the lesions [14]. A similar correlation was observed in a cross-sectional study that assessed the bacterial profile in individuals with seborrheic dermatitis compared to healthy individuals. The results indicate a statistically significant increase in the population of *Staphylococcus* bacteria compared to the control group. As in most available scientific studies, the authors mention the need for additional research focused on analyzing the skin microbiome of patients with seborrheic dermatitis [19].

Inflammation

Fungi of the genus *Malassezia* use lipase and phosphatase to break down lipids, which are components of the sebum produced by the sebaceous glands in the dermis. The products of lipolysis generated by enzymes secreted by the fungi cause inflammation and damage the skin barrier. The consequence of these chemical reactions is excessive cell proliferation and abnormal keratinization. As a result, individuals with seborrheic dermatitis exhibit a characteristic pattern of recurrent erythematous and desquamative skin lesions. Delving into the components of the immune response in patients with seborrheic dermatitis, we can observe a cascade of immune reactions that, in predisposed individuals, activates pro-inflammatory cytokines via fungi of the genus *Malassezia* and contributes to the development of skin inflammation [2, 11, 16].

Histopathology

Seborrheic dermatitis, like other dermatoses, can have an acute, subacute, or chronic course. In histopathological examination of the acute form, characteristic features include spongy keratinization of the skin, parakeratosis around hair follicle openings, mild lymphocytic infiltrates surrounding blood vessels, irregular thinning of the granular layer, dilation of vessels in the superficial vascular plexus, and mild edema of the papillary dermis. Infiltrates composed of histiocytes, and to a lesser extent neutrophils, may also be present around blood vessels [6, 11, 15].

Predisposing factors

Seborrheic dermatitis is a condition that affects men more frequently than women in the adult population. In addition to gender-related factors, other predisposing factors also influence the incidence of this condition. Risk factors include fair skin, particularly Fitzpatrick skin types I–

III, the winter season, increased concentrations of *Malassezia* fungi, increased sebaceous gland activity, and neurological diseases, particularly Alzheimer's and Parkinson's disease. Additionally, certain medications are predisposing factors for the disease, such as dopamine receptor blockers, which reduce dopaminergic transmission, lithium, and immunosuppressive drugs [1, 3, 4, 8]. The immune system also plays a significant role in the development of seborrheic dermatitis. Immune deficiencies predispose individuals to inflammatory skin conditions. This is particularly evident in patients with HIV infection or AIDS, organ transplant recipients, and individuals with hepatitis C, chronic alcoholic pancreatitis, lymphoma, or other cancers [5, 10]. It has been demonstrated that patients with seborrheic dermatitis exhibit elevated levels of inflammatory cytokines, tumor necrosis factor, and interleukins [4]. Additionally, genetic factors predisposing to the development of seborrheic dermatitis have been identified. Studies have identified characteristic genetic mutations in humans, particularly within the *C5*, *IKBK*G, *STK4*, *ZNF750*, *BTD*, and *ACT1* genes. These individual genes play varying roles in maintaining the body's normal immune response and are responsible for the proper functioning of the skin barrier [16].

Treatment:

Topical drug therapy

The mainstay of treatment consists of antifungal medications, particularly topical preparations containing ketoconazole, fluconazole, bifonazole, miconazole, and ciclopirox. These substances are typically administered in the form of creams, gels, foams, or shampoos. These preparations have antifungal properties and inhibit the proliferation of *Malassezia* yeast. In cases of lesions with more severe inflammation, it is advisable to include topical glucocorticosteroids, such as betamethasone valerate, hydrocortisone butyrate, mometasone furoate, clobetasol, or fluocinolone, often in combination therapy with antifungal medications. Glucocorticosteroids have anti-inflammatory and antipruritic effects, thereby providing relief to patients during disease flare-ups. These medications should be used with caution, preferably in short-term regimens lasting a few days, due to the risk of adverse effects such as skin atrophy, the formation of stretch marks, or telangiectasia [2, 5, 10, 13, 15]. One promising area of treatment involves the use of cAMP-type 4 phosphodiesterase (PDE-4) inhibitors. The pharmacological effect of these agents is based on the inhibition of inflammatory mediators. The positive effects of the topical PDE-4 inhibitor crisaborole and roflumilast in the form of a

0.3% foam have been demonstrated, with roflumilast formulations providing greater benefits for patients [10, 13]. Topical calcineurin inhibitors, which exhibit anti-inflammatory and immunomodulatory effects, are used in second-line treatment. Pimecrolimus as a 1% cream and tacrolimus as a 0.1% ointment are mentioned as alternatives to glucocorticosteroids due to fewer serious adverse effects with topical use. Nevertheless, these preparations have not been approved by the U.S. Food and Drug Administration (FDA) for patients with seborrheic dermatitis [10, 11, 13, 15]

Dermocosmetics

Dermocosmetics used for symptomatic treatment alleviate the course of the disease, relieve skin itching, and improve the patient's overall mental well-being. The most important aspect is cleansing the scalp with mild cleansers that do not damage the protective barrier. Patients with scalp lesions are often prescribed shampoos and preparations containing tea tree oil, salicylic acid, selenium sulfide, urea, propylene glycol, and lactic acid. These substances have a cleansing effect by exfoliating and softening the epidermis [10, 11, 15]. Humectants with moisturizing properties and products containing oils that remove excess sebum play a particularly important role in skincare. To regenerate the hydrolipid barrier, preparations rich in ceramides, which are responsible for the proper integrity of the skin barrier, can be used. Preparations containing ceramides are used with satisfactory effectiveness in other dermatoses [11, 15]. Glycyrrhizic acid is also used in cosmetics that reduce skin lesions. This compound exhibits anti-inflammatory, antimicrobial, and free radical-scavenging properties. To reduce the severity of symptoms, skincare products containing allantoin, bisabolol, inositol, or panthenol [11].

Oral medication

Another treatment option is oral medication, which is primarily intended for patients with severe disease and skin lesions that are resistant to topical treatment. Oral antifungal medications such as fluconazole, itraconazole, ketoconazole, pramiconazole, and terbinafine are used. Additionally, isotretinoin preparations, oral glucocorticosteroids (mainly prednisone), and apremilast, an oral PDE-5 inhibitor used off-label, are employed. However, previous research has not provided conclusive evidence confirming the high efficacy of these agents in the treatment of seborrheic dermatitis. Therefore, their use should be considered on a case-by-

case basis, with caution and taking side effects into account. Both systemic treatment and phototherapy can be administered concurrently with topical therapy [10, 11, 13].

Phototherapy, laser therapy, cryotherapy

In patients with severe seborrheic dermatitis, phototherapy may be considered. Phototherapy using one of the following methods, UVB radiation, intense pulsed light (IPL), photodynamic therapy (PDT), or light-emitting diode (LED) therapy, can effectively help reduce skin lesions, alleviate itching, and resolve inflammation. Despite its positive effect on the skin condition of patients with seborrheic dermatitis, long-term exposure to UV radiation may be associated with an increased risk of developing skin cancer [5, 13]. In addition, cryotherapy and laser therapy in combination with tacrolimus may be considered to alleviate symptoms. Studies conducted on a small number of participants (24 patients for cryotherapy and 34 patients for laser therapy) have demonstrated a positive effect and a reduction in skin lesions [13].

Non-pharmacological methods

In addition to drug therapy, supportive measures—including psychological counseling, regular physical activity, proper humidity levels, and a healthy diet—also play a significant role in improving patients' quality of life. The therapeutic methods used typically allow for control of the disease's symptoms, but do not lead to a complete cure, which explains the chronic and recurrent nature of the condition. The primary goal of treating seborrheic dermatitis of the scalp is to improve the patient's daily functioning, alleviate symptoms, and reduce disease flare-ups [2, 11].

Diet for Seborrheic Dermatitis

A properly balanced diet tailored to various types of food intolerances is one of the key elements of the human body's proper functioning. Dietary modifications and the restriction of certain foods can have a positive impact on the course of inflammatory skin diseases and may serve as an important adjunct to the treatment of dermatological conditions. However, further research is needed to unequivocally assess the effectiveness of dietary interventions in this patient group. In a cross-sectional study by Martijn GH Sanders et al., the results showed that a fruit-based diet has a positive effect on the skin condition of patients with seborrheic dermatitis. Fruits are foods rich in vitamins, antioxidants with free-radical-scavenging properties, psoralens, and flavonoids. A diet consisting of meat products, highly processed foods, and alcohol contributed

to the occurrence of erythematous and desquamative skin lesions in women, whereas this association was not observed in the group of men [3]. Alcohol consumption also contributed significantly to the worsening of skin lesions in patients with seborrheic dermatitis [17]. An analysis of questionnaires completed by patients with seborrheic dermatitis showed that a diet rich in citrus fruits and vegetables alleviated the symptoms of seborrheic dermatitis, while sweets, fried or spicy foods, and dairy products exacerbated the skin lesions. An interesting point is that citrus fruits may have had the opposite effect in some patients and negatively affected the condition of their skin [2]. A properly tailored diet can also have a beneficial effect on other skin conditions, such as acne vulgaris and rosacea. To reduce skin lesions associated with acne vulgaris, it is recommended to follow a diet that limits foods with a high glycemic index, dairy products, red meat, and whey protein. Furthermore, for patients with rosacea, a diet focused on vegetables and fruits, lean meat, and limiting dairy products, coffee, tea, bread, red wine, beer, and other yeast-rich products responsible for alcoholic fermentation is particularly important [9]. Such a diet may help reduce the severity of skin lesions and inflammation. Given the similarity of certain pathogenic mechanisms associated with inflammatory processes, similar dietary recommendations may also be considered for patients with seborrheic dermatitis. The data available in scientific articles point to a direction that may yield positive outcomes for patients with seborrheic dermatitis. Most authors emphasize the need for more research on the impact of specific foods and entire dietary patterns on the course of seborrheic dermatitis.

Discussion:

In this narrative review, we analyzed articles, systematic reviews, narrative reviews, and case reports that addressed the impact of daily diet and specific foods on the course of seborrheic dermatitis. In a cross-sectional study, Sanders et al. assessed the impact of diet on skin condition and the severity of lesions in 636 patients with seborrheic dermatitis out of approximately 4,000 eligible individuals. The study analyzed various types of diets and the relationship between them and the occurrence of skin lesions. The researchers identified four dietary patterns, including a vegetable-based diet, a Western-style diet characterized by the consumption of meat products, potatoes, and alcoholic beverages, a fruit-based diet, and a diet high in both healthy and unhealthy fats. It was demonstrated that a dietary pattern based on fruits, which are rich in vitamins, antioxidants, and flavonoids, correlates with a reduced risk of skin lesions in the

course of seborrheic dermatitis. The aforementioned substances found in fruits have the ability to reduce inflammation, which is a component of the disease's pathophysiology. Further standardized studies are needed to investigate the effects of antioxidants on seborrheic dermatitis. In addition, the authors cite psoralen, found primarily in citrus fruits, as a factor in seborrheic dermatitis; by increasing sensitivity to UV radiation, it may have a positive effect on skin condition. The dietary pattern described by the authors as "Western," which is rich in meat products, highly processed foods, and alcohol, contributed to the occurrence of characteristic erythematous and desquamative skin lesions in female patients compared to male patients, in whom no similar effect was observed. No effect of dietary patterns based on vegetables and fats on skin condition was demonstrated [3]. In a systematic review by Emily Woolhiser et al. on nutrition, obesity, and seborrheic dermatitis, attention was drawn to two fat-soluble vitamins. Vitamin E was highlighted due to its antioxidant properties. Low levels of this vitamin have been observed in patients with seborrheic dermatitis; therefore, supplementation may have a positive effect on skin lesions associated with seborrheic dermatitis, as well as in other dermatological conditions such as atopic dermatitis or psoriasis. A similar association has been demonstrated for vitamin D deficiency in patients with seborrheic dermatitis. Vitamin D influences the differentiation and apoptosis of keratinocytes and exhibits immunomodulatory effects. Despite the finding of reduced levels of vitamins D and E, further studies focusing on the effects of supplementation in this patient group are needed. The article also cites a randomized study of 80 patients with seborrheic dermatitis regarding prebiotic supplementation. The polyphenol-rich prebiotic Triphala reduced sebum secretion on the scalp and improved well-being. This trial was conducted on a small number of participants, and further studies of this preparation are required [1]. In a retrospective study, Malak Alshaebi et al. used a questionnaire to analyze the dietary habits of 267 participants. Of these, 59 individuals suffered from seborrheic dermatitis. The study's findings suggest that citrus fruits and vegetables, particularly green, leafy vegetables, alleviated the symptoms of seborrheic dermatitis. Foods such as sweets, fried or spicy dishes, and dairy products were identified as items that exacerbated skin lesions. Attention should be paid to differences in results compared to a cross-sectional study involving a larger number of patients. In a cross-sectional study by Martijn GH Sanders et al., it was shown that a diet rich in fruits correlates with a reduced risk of skin lesions, whereas according to reports from respondents in the study by Malak Alshaebi et al., citrus fruits demonstrated both the potential to alleviate and to

exacerbate the course of the disease. Due to the small number of participants in the study by Malak Alshaebi et al. and its subjective nature, the conclusions are for illustrative purposes only and require cautious interpretation [2, 3]. In a review article on the skin-gut axis, authors Melody Maarouf et al. cited a study by E. Mahmudi et al., in which in vitro tests were conducted using an ethyl acetate fraction of kombucha tea. Under laboratory conditions, significant antifungal activity against *Malassezia* species was demonstrated at a fraction concentration of 80 mg/mL. The data were presented in a table with dietary recommendations, and the need for further studies in living organisms was highlighted [9].

In a case-control and case-crossover study by Rémi Lancar et al., involving 189 patients with seborrheic dermatitis and 189 control subjects, the association between stress, alcohol, and smoking with seborrheic dermatitis was analyzed. Based on the case-control study, it was concluded that alcohol was a factor associated with seborrheic dermatitis, while the case-crossover study, which included 81 participants, showed that alcohol consumption, primarily during the preceding month, significantly contributed to the exacerbation of skin lesions [17]. Given the role of vitamins in the regenerative processes of the skin's outer layer, the consumption of foods rich in B vitamins may be an interesting topic to investigate. Vitamin B2 (riboflavin) is essential for the proper functioning of the skin. Its deficiency may manifest as an exacerbation of skin lesions associated with seborrheic dermatitis. Long-term deficiencies of vitamin B2 can lead to a deterioration in skin condition, loss of elasticity, and accelerated aging. The main dietary sources of riboflavin include dandelion, yeast, eggs, and dairy products. Another vitamin whose deficiency may contribute to worsening skin lesions in seborrheic dermatitis is vitamin B6 (pyridoxine). Supplementation with it may help improve skin condition by participating in metabolic and regenerative processes and regulating immune system function. Pyridoxine occurs naturally in whole grains, nuts, bananas, legumes such as chickpeas, and animal-derived products, including poultry, liver, and fatty fish. The effects of vitamins B2 and B6 require targeted studies to determine the positive or negative effects of consuming foods rich in these vitamins in patients with seborrheic dermatitis [18, 21].

Conclusion:

Seborrheic dermatitis is a chronic condition affecting approximately 5% of the population. Its chronic and recurrent nature significantly impacts the physical and mental well-being of patients with seborrheic dermatitis. Due to the presence of non-modifiable risk factors such as

skin phenotype, gender, or genetic predisposition, special attention should be paid to aspects of daily life, including diet, proper skin care, and the reduction of stressors, which are modifiable and can effectively provide relief during flare-ups or prevent them. In this narrative review, we analyzed articles, systematic reviews, narrative reviews, and case reports concerning the impact of daily diet on the course of seborrheic dermatitis. Dietary recommendations are primarily based on incorporating fruits into the daily diet, particularly citrus fruits, which are rich in antioxidants and vitamins that support the body's proper functioning. Additionally, the recommendations emphasize limiting meat products, highly processed foods, and alcohol. According to available studies, dietary modifications and the exclusion of the aforementioned foods may have a positive effect, particularly in female patients. Limiting the consumption of alcohol, sweets, fried and spicy foods, and dairy products may help reduce the risk of exacerbations of skin lesions in seborrheic dermatitis. Avoiding factors that exacerbate the disease, and consequently reducing itching and the severity of skin lesions, has a positive impact on the patient's mental and physical well-being. Due to the limited number of targeted studies on the impact of diet on the course of seborrheic dermatitis, further observational or experimental studies are needed.

Disclosure:**Author's Contribution:**

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