

# Beyond the skin: Unraveling the connection between atopic dermatitis and obsessive-compulsive disorder

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## ABSTRACT

**Background:** Atopic dermatitis (AD) is a chronic skin disorder affecting up to 20% of the population characterized by a compromised skin barrier, elevated immunoglobulin E (IgE), and immune system dysregulation. Various factors, including genetic predisposition and environmental triggers, contribute to AD's pathogenesis. Treatment approaches include topical moisturizers, anti-inflammatory therapies, phototherapy, and systemic medications for severe cases. The condition is associated with allergic and autoimmune diseases, and elevated IgE levels may indicate allergic disorders or be associated with other conditions such as infections or cancer. There is a known link between AD and neuropsychiatric disorders, yet limited data exists on its connection to obsessive-compulsive disorder (OCD). **Materials and Methods:** This case report examines a thirty-year-old patient suffering from severe, persistent pruritus despite two years of topical steroid treatment. The patient had no significant medical history, recent travel, or medication use. Examination revealed scratch marks without primary lesions, and a skin biopsy showed dermal eosinophilia. Blood tests indicated eosinophilia and elevated IgE levels (7280 IU/mL), suggestive of allergic pathology, although allergy testing was negative. Treatment included montelukast, antihistamines, and desensitization, yet with no improvement after six months. Following psychiatric consultation, the patient was diagnosed with OCD, linked to sterilization obsessions exacerbated by the COVID-19 pandemic. **Results:** Treatment with systemic antidepressants and behavioral therapy led to significant symptom improvement. The diagnosis of allergic dermatitis was confirmed, and the OCD treatment improved the patient's quality of life. This case underscored the complex interaction between dermatological and psychiatric disorders. **Conclusions:** This case highlighted the importance of recognizing psychiatric comorbidities such as OCD in patients with atopic dermatitis. Early diagnosis and treatment may lead to better therapeutic outcomes. The bidirectional relationship between dermatological and psychiatric disorders calls for increased awareness and interdisciplinary collaboration in patient care. Further research into shared genetic and environmental pathways is essential for developing targeted interventions.

**Key words:** Atopic Dermatitis, OCD, Pruritus, Comorbidities

## INTRODUCTION

Atopic dermatitis (AD) is a long-standing and chronic inflammatory skin condition that affects nearly 20% of individuals around the world [1]. This disorder is marked by a disruption in the skin's protective barrier, an elevation of immunoglobulin E (IgE) levels, and various immune system imbalances. The onset of AD is influenced by a combination of genetic susceptibility and environmental triggers, resulting in

a multifaceted clinical presentation, often involving severe itching and eczematous rashes [2]. The immune system's heightened response in individuals with AD is evidenced by elevated IgE levels, which are frequently associated with allergy [3].

The management of AD is tailored to its severity and may range from basic treatments such as the application of moisturizers and topical anti-inflammatory medications to more potent therapies, including corticosteroids and

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calcineurin inhibitors. In more severe cases, patients may require advanced treatments such as phototherapy or systemic immunomodulators [4,5]. However, despite the availability of these therapies, the treatment of AD is often complicated by the presence of concurrent allergic and autoimmune conditions, including asthma, allergic rhinitis, and various food sensitivities, making the disease challenging to manage [6,7].

Beyond its obvious dermatological symptoms, AD has been increasingly associated with a range of neuropsychiatric disorders. Studies have identified connections between AD and conditions such as attention deficit/hyperactivity disorder (ADHD) and autism spectrum disorder (ASD) [8]. However, research into the link between AD and obsessive-compulsive disorder (OCD), a condition characterized by recurring, intrusive thoughts and compulsive behavior, remains limited. This case study sought to investigate the potential relationship between AD and OCD, highlighting the complex interplay between dermatological and psychiatric disorders [9].

## MATERIALS AND METHODS

We present the case of a thirty-year-old female patient who had been suffering from severe, chronic itching (pruritus) for two years, despite the regular application of topical corticosteroids. Her medical history did not reveal any notable contributing factors; there were no reported allergies, no recent travel history, and no recent introduction of new medications. This lack of significant medical background initially made it difficult to pinpoint a specific cause for her persistent symptoms.

Upon clinical examination, multiple excoriations, or scratch marks, were observed on her back, yet no primary lesions were visible, which is uncommon in cases of allergic skin disorders. Given the absence of clearly identifiable skin lesions, a skin biopsy was taken to further investigate the underlying cause. The biopsy revealed dermal eosinophilia, a key indicator often associated with allergic skin conditions. In addition to the biopsy results, blood tests showed pronounced eosinophilia and exceptionally high levels of immunoglobulin E (IgE), which peaked at 7280 IU/mL—strongly suggesting an allergic etiology. However, despite these suggestive findings, multiple allergy evaluations, including skin prick tests and serum-specific IgE assays, yielded negative results, providing no clear allergic triggers.

The patient's initial treatment plan included montelukast, a leukotriene receptor antagonist, along with antihistamines and a desensitization protocol aimed at decreasing her hypersensitivity responses. Despite adherence to this treatment regimen for six months, the patient experienced no significant relief from her symptoms. With the failure of these conventional therapies, a more extensive diagnostic approach was taken. This involved additional skin biopsies and repeated bloodwork, yet all further investigations continued to return inconclusive results, leaving the underlying cause unresolved.

Given the unresponsiveness to standard treatments and the absence of identifiable allergic triggers, a psychiatric evaluation was considered as part of a broader diagnostic framework. The psychiatric assessment led to a diagnosis of obsessive-compulsive disorder (OCD), with the psychiatrist attributing the elevated IgE levels and persistent itching to the patient's compulsive behaviors, particularly her obsession with cleanliness and sterilization, which had intensified due to the COVID-19 pandemic. Her excessive use of alcohol-based hand sanitizers contributed to the breakdown of her skin's barrier function, aggravating the chronic pruritus.

## RESULTS

Following the diagnosis of obsessive-compulsive disorder (OCD), the treatment plan for the patient was comprehensively adjusted to include systemic antidepressants, specifically selective serotonin reuptake inhibitors (SSRIs), and was complemented by cognitive-behavioral therapy (CBT) tailored to address her compulsive behaviors and rituals. This combined psychiatric intervention, which integrated both pharmacological and psychotherapeutic approaches, resulted in notable and substantial improvements in both the patient's dermatological and psychiatric symptoms. Over the course of several months, there was a marked reduction in the intensity of her pruritus, a condition that had previously been severe and debilitating. Concurrently, her levels of immunoglobulin E (IgE), while still elevated compared to the general population, began to show a gradual decrease. This outcome underscores the critical importance of employing an integrated treatment strategy that encompasses both dermatological and psychiatric care, demonstrating its effectiveness in managing complex cases.

This case highlights the vital need to assess and address psychiatric comorbidities in individuals suffering from persistent dermatological conditions, particularly when traditional treatments fail to provide adequate relief. The growing body of literature increasingly supports the connection between atopic dermatitis (AD) and OCD. Emerging research suggests that the immune system abnormalities observed in AD patients may play a significant role in the development of OCD. Specifically, immune dysregulation associated with AD could potentially trigger neuroinflammatory responses, which may, in turn, exacerbate psychiatric symptoms [10,11]. This case exemplified the necessity of a holistic treatment approach, emphasizing the need for a multidisciplinary strategy that addresses both the dermatological and psychiatric dimensions of complex patient presentations.

## DISCUSSION

The intricate bidirectional relationship between dermatological conditions such as atopic dermatitis (AD) and psychiatric disorders such as obsessive-compulsive disorder (OCD) underscores the critical need for a holistic and multifaceted approach to patient management. Extensive research has documented the impact of AD on mental well-being, revealing that the chronic inflammation and persistent pruritus associated with AD are strongly correlated with heightened incidences of anxiety, depression, and other mood disorders [12-14]. This relationship is thought to be driven by complex neuroimmune interactions, where sustained immune activation in AD leads to the production of pro-inflammatory cytokines. These cytokines have the capacity to cross the blood-brain barrier, thereby influencing neural circuits involved in mood regulation [13,14]. Similarly, psychiatric disorders such as OCD may also be associated with immune dysregulation, as some patients with OCD exhibit elevated levels of inflammatory biomarkers [15].

In the case of our patient, the excessive and prolonged use of alcohol-based sanitizers, driven by obsessions related to cleanliness and sterilization exacerbated her dermatological symptoms. This behavior compromised her skin barrier, creating a vicious cycle of increased pruritus and inflammation. It is evident that her OCD contributed significantly to the persistence of the symptoms, directly impacting her skin condition. This case highlights the crucial importance of integrating psychiatric evaluation and intervention

in the management of patients with AD, particularly when conventional dermatological treatments fail to alleviate their symptoms.

Our observations are consistent with the growing body of research exploring the connections between AD and psychiatric disorders. While the precise mechanisms linking AD with OCD remain partially understood, it is likely that shared genetic and environmental factors play a significant role [16]. Further research is needed to elucidate these underlying mechanisms more clearly and to develop targeted therapeutic strategies for individuals grappling with both dermatological and psychiatric conditions. This case study underscores the necessity for a comprehensive and interdisciplinary approach to effectively address and manage complex patient presentations.

The bidirectional relationship between dermatological conditions such as AD and psychiatric disorders such as OCD highlights the necessity for a comprehensive approach to patient management. The effects of AD on mental well-being have been extensively documented, with research indicating that chronic inflammation and persistent pruritus associated with AD are linked to higher incidences of anxiety, depression, and other mood disorders.

## CONCLUSION

This case highlights the profound and multifaceted relationship between atopic dermatitis (AD) and obsessive-compulsive disorder (OCD), illustrating the critical need for clinicians to remain vigilant about the potential for psychiatric comorbidities in patients presenting with dermatological conditions. The integration of psychiatric evaluation into dermatological care has been shown to significantly enhance the effectiveness of treatment strategies and improve the overall quality of life for affected individuals.

The bidirectional nature of the relationship between dermatological and psychiatric disorders underscores the necessity for heightened awareness and a comprehensive approach among healthcare providers. Dermatologists, in particular, who often act as the initial point of contact for patients with AD, must be especially attuned to the possibility of underlying psychiatric conditions. Addressing these comorbidities through timely diagnosis and integrated care may lead to more nuanced and effective treatment plans.

Future research is essential to further elucidate the common genetic and environmental factors that contribute to the co-occurrence of AD and OCD. A deeper understanding of these shared determinants will facilitate the development of more targeted therapeutic interventions. Moreover, incorporating psychiatric assessments into routine dermatological evaluations may greatly aid in the early identification of comorbid conditions, allowing for the formulation of personalized and comprehensive treatment strategies.

Recognizing and addressing the psychological dimensions of chronic skin disorders such as AD may lead to a more holistic approach to patient management. By integrating mental health considerations into dermatological care, clinicians can achieve improved outcomes in both dermatological and psychological domains, ultimately enhancing the overall well-being of patients.

## REFERENCES

- Weidinger S. Atopic dermatitis. *Nat Rev Dis Primers*. 2018;4:1.
- Lyons JJ, Milner JD, Stone KD. Atopic dermatitis in children: Clinical features, pathophysiology, and treatment. *Immunol Allergy Clin North Am*. 2015;35:161-83.
- Kapoor R, Menon C, Hoffstad O, Bilker W, Leclerc P, Margolis DJ. The prevalence of atopic triad in children with physician-confirmed atopic dermatitis. *J Am Acad Dermatol*. 2008;58:68-73.
- Eichenfield LF, Tom WL, Berger TG, Krol A, Paller AS, Schwarzenberger K, et al. Guidelines of care for the management of atopic dermatitis: Section 2. Management and treatment of atopic dermatitis with topical therapies. *J Am Acad Dermatol*. 2014;71:116-32.
- Sidbury R, Davis DM, Cohen DE, Cordoro KM, Berger TG, Bergman JN, et al. Guidelines of care for the management of atopic dermatitis: Section 3. Management and treatment with phototherapy and systemic agents. *J Am Acad Dermatol*. 2014;71:327-49.
- Paller A, Jaworski JC, Simpson EL, Boguniewicz M, Russell JJ, Block JK, et al. Major comorbidities of atopic dermatitis: Beyond allergic disorders. *Am J Clin Dermatol*. 2018;19:821-38.
- Ivert LU, Wahlgren CF, Lindelöf B, Dal H, Bradley M, Johansson EK. Association between atopic dermatitis and autoimmune diseases: A population-based case-control study. *Br J Dermatol*. 2021;185:335-42.
- Chen MH, Su TP, Chen YS, Hsu JW, Huang KL, Chang WH. Is atopy in early childhood a risk factor for ADHD and ASD? A longitudinal study. *J Psychosom Res*. 2014;77:316-21.
- Gunduz S, Usak E, Ozen S, Gorpelioglu C. Obsessive-compulsive symptoms and quality of life in mothers of children with atopic dermatitis. *Actas Dermosifilogr*. 2017;108:432-7.
- Ford DE, Erlinger TP. Depression and C-reactive protein in US adults: Data from the Third National Health and Nutrition Examination Survey. *Arch Intern Med*. 2004;164:1010-4.
- Şimşek Ş, Yüksel T, Çim A, Kaya S. Serum cytokine profiles of children with obsessive-compulsive disorder shows the evidence of autoimmunity. *Int J Neuropsychopharmacol*. 2016;19:pyw027.
- Silverberg JI. Comorbidities and the impact of atopic dermatitis. *Ann Allergy Asthma Immunol*. 2019;123:144-51.
- Tiemeier H, Hofman A, van Tuijl HR, Kiliaan AJ, Meijer J, Breteler MM. Inflammatory proteins and depression in the elderly. *Epidemiology*. 2003;14:103-7.
- Levine J, Barak Y, Chengappa KN, Rapoport A, Rebey M, Barak V. Cerebrospinal cytokine levels in patients with acute depression. *Neuropsychobiology*. 1999;40:171-6.
- Marazziti D, Mucci F, Fontenelle LF. Immune system and obsessive-compulsive disorder. *Psychoneuroendocrinology*. 2018;93:39-44.
- Mataix-Cols D, Frans E, Pérez-Vigil A, Kuja-Halkola R, Gromark C, Isomura K, et al. A total-population multigenerational family clustering study of autoimmune diseases in obsessive-compulsive disorder and Tourette's/chronic tic disorders. *Mol Psychiatry*. 2018;23:1652-8.

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