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Review

Bridging the Gap between Dermatology and Psychiatry: Prevalence and Treatment of Excoriation Disorders Secondary to Neuropsychiatric Medications

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Abstract: (1) Background: The dermatillomania and trichotillomania disorders in this study refer to the subcategory of obsessive-compulsive disorders (OCDs) that are medication-induced. Patients with typical dermatillomania or trichotillomania disorder generally present with other OCD symptoms, although this is not present in the cases of medication-induced skin picking or hair pulling disorders found in the current literature. This paper serves to investigate the prevalence and treatment methods of medication-induced excoriation disorders. (2) Methods: The PubMed database was queried for cases of medication-induced dermatillomania or trichotillomania. The database search resulted in 80 results, 7 of which were full-length case reports in English with acceptable detail on clinical course, yielding nine patients. (3) Results: All patients who discontinued their offending agent had complete resolution of symptoms. Patients who continued their medications saw a resolution of symptoms when treated with an additional medication. Atypical antipsychotics and SSRIs were also noted to have been the offending agent in some cases but a successful treatment in other cases. (4) Conclusion: Patients who discontinued their offending agent or added additional pharmacotherapy for dermatillomania or trichotillomania had the best outcomes. Abnormal serotonin and dopamine levels are thought to be connected to the pathology of this disease.

Keywords: dermatillomania; trichotillomania; excoriation

Citation: Thompson, B.M.; Brady, J.M.; McBride, J.D. Bridging the Gap between Dermatology and Psychiatry: Prevalence and Treatment of Excoriation Disorders Secondary to Neuropsychiatric Medications. *Psych* **2023**, *5*, 670–678. https://doi.org/10.3390/psych5030043

Academic Editor: Marianna Mazza

Received: 28 May 2023
Revised: 1 July 2023
Accepted: 3 July 2023
Published: 5 July 2023

1. Introduction

Dermatillomania (also known as excoriation or skin picking disorder) and trichotillomania (also known as hair pulling disorder) are classified under obsessive-compulsive-related disorders in the American Psychiatric Association's DSM-5 [1]. These behaviors can also be classified as grooming disorders, impulse control disorders, or body-focused repetitive behaviors (BFRBs) [2]. These disorders impact women more than men and may result in general medical problems (irreversible hair loss, keloids, infection) that add to baseline stress [3]. Dermatillomania is estimated to impact approximately 2.1% of the US population, with depression, anxiety, and panic disorder as the most common comorbidities [2]. Trichotillomania is estimated to impact about 0.5 to 2.0% of the US population [4]. The exact mechanism within the brain that leads to BFRBs is unknown, rendering it one of the most understudied, undertreated, and underdiagnosed disorders [2]. Dermatillomania and trichotillomania leading to excoriations are two of various causes of prurigo nodularis, an often debilitating condition involving extreme pruritus and papules or ulcerations on the skin secondary to chronic scratching and picking [5]. Prurigo nodularis is most often seen secondary to atopic dermatitis, commonly known as eczema, which is much more prevalent than BFRBs like dermatillomania and trichotillomania [5]. Misdiagnosis of the primary cause of prurigo nodularis in patients with BFRBs can lead to delayed treatment and prolonged discomfort [5]. Therefore, it is imperative that dermatologists be

aware of BFRBs and exclude them as possibilities when examining patients with excessive excoriations or prurigo nodularis.

In recent years, multiple case reports have described the onset of dermatillomania or trichotillomania resulting in excoriated skin lesions in patients receiving various medications related to mental health. Patients with typical skin picking or hair pulling disorders generally present with other OCD symptoms. However, cases of substance- or medication-induced skin picking or hair pulling disorders found in the current literature do not show the pre-existence of other OCD behaviors. Whether these medications would cause similar effects in patients without underlying mental health disorders is unknown. As the prevalence of diagnosed and treated mental health disorders increases, the incidence of these adverse events may increase as well. We reviewed the literature for case reports of patients with underlying neurologic or psychiatric disorders who were treated with medications and subsequently developed evidence of dermatillomania or trichotillomania; we report the time of onset, prognosis, and treatment used. The goal of this review is to provide clinicians with a better understanding of this potential adverse effect and to help bridge the gap between dermatological and psychiatric knowledge. It is likely that dermatologists may be the first to become aware of the symptoms of these conditions, so it is important that they understand the pathophysiology and psychiatric aspect of BFRBs as well as have knowledge on how to go about suggesting medication optimization. Additionally, dermatologists should be comfortable knowing when to refer patients to psychiatric colleagues for a multidisciplinary approach.

2. Materials and Methods

The PubMed/MEDLINE database was queried using the following search phrases: "Induced Skin Picking", "Induced Dermatillomania", and "Induced Trichotillomania". To be included, articles needed to be full length, in English, and report findings of skin picking or hair pulling resulting in excoriation following new administration or an increase in the dose of a medication. Articles additionally needed to include clinical outcomes for the patient and satisfactory details of the condition. The database search resulted in 80 results, out of which 72 were full-length. Seven relevant case reports gave acceptable levels of detail on patient clinical course and recovery and were included in this study, which follows 9 total patients.

3. Results

This review includes nine total cases from seven different case reports or series. Table 1 summarizes the demographics, initial diagnoses, and medication history of each patient, while Table 2 describes in detail the subsequent skin picking or hair pulling manifestations as well as the treatment course following the noted adverse effect. The study included five females and four males. The age range of the patients in this study was 5 to 56. As this study only followed nine patients, we are unable to comment on the overall distribution of these disorders amongst age groups, genders, and other demographic categories. Analysis of additional cases would be needed to determine if age, sex, or other prognostic factors are correlated with dermatillomania or trichotillomania related to medication.

Patients were receiving treatment for various disorders, including obsessive-compulsive disorder (OCD), separation anxiety disorder, Parkinson's disease, attention-deficit/hyperactivity disorder (ADHD), and schizophrenia. Four patients (44%) were noted to have been switched from the offending agent to a similar medication without significant improvement in any case. Only one patient had a previous mild skin picking disorder present before medication therapy. All other patients (89%) had a past medical history negative for dermatillomania and trichotillomania. One patient reported a positive family history of skin picking disorder, but this information may be missing from additional cases as there were no other cases that reported a family history of skin picking disorder. Dermatillomania and trichotillomania began as early as a few days into treatment and as late as two months;

however, this may not be due to the detection time of the adverse effect but rather the time of the scheduled follow-up appointment.

Table 1. Characteristics, initial diagnoses, and medication history of patients with excoriation disorders secondary to medication initiation or changes.

Age/Sex	Past Medical History	Medication History	Citation
5/F	Separation anxiety disorder, inability to fall asleep without mother, and school refusal lasting one year	Fluoxetine 5 mg/d started and increased to 10 mg/d after 1 week; all separation anxiety symptoms decreased after 1 month After a few days on fluoxetine, adverse effects of compulsive asking behavior and skin picking behind the ear until excoriation were noted Fluoxetine decreased to 5 mg/d and compulsive asking behavior disappeared; skin picking continued, although lessened	[6]
30/F	Obsessive-compulsive disorder, consistent blood contamination obsessions, fear of contaminating or harming others, excessive hand washing, cleaning and repeating rituals, and ordering compulsions, Yale–Brown Obsessive-Compulsive score of 30 Father had Dermatillomania	Fluvoxamine 50 mg/d started and increased to 100 mg/d after 2 weeks; skin picking developed during this time Six weeks following initial start of medication, dosage increased to 250 mg/d with no improvement in OCD symptoms and pathological skin picking still present After 12 weeks, fluvoxamine was discontinued and skin picking symptoms ceased within a week, whereas obsessive-compulsive symptoms persisted	[7]
27/F	Obsessive-compulsive disorder (present since childhood), reported need for symmetry and precision, checking and ordering obsessions, need to touch, and constant doubt and fear of something terrible happening to family, Yale–Brown Obsessive-Compulsive score of 34 Mild Dermatillomania	Paroxetine 20 mg/d started and titrated over a period of 6 weeks to 60 mg/d; during this time, there was an exacerbation of initially mild skin picking and no OCD relief Paroxetine tapered off in 4 weeks to final dose of 15 mg, replaced the following week with venlafaxine 75 mg/d titrated over 8 weeks to 300 mg/d; during this time, no improvement in skin picking or OCD Treatment with venlafaxine discontinued, and 2 weeks later, skin picking and OCD symptoms returned to pre-treatment levels	[7]
56/F	Parkinson's disease	Rasagiline 1 mg/d initiated with addition of extended-release ropinirole 8 mg/d 18 months later Two months following ropinirole initiation, hair pulling causing excoriations developed Ropinirole was substituted for pramipexole with maintained rasagiline; patient showed transient improvement Rasagiline stopped and patient given extended-release pramipexole 1.57 mg/d and levodopa 200 mg/d; hair pulling continued	[8]
54/F	Parkinson's disease, major depressive disorder, mild dermatillomania	Rasagiline initiated and 6 months later extended-release pramipexole 1.05 mg/d was started; several weeks later, excessive hair removal on chin noted Fluoxetine added for major depressive disorder with no effect on hair pulling Switch from pramipexole to levodopa while maintaining rasagiline; no impact on hair pulling noted	[8]

Table 1. *Cont.*

Age/Sex	Past Medical History	Medication History	Citation
7/M	Attention-deficit hyperactivity disorder, specific learning disorder, hyperactivity, difficulty completing tasks, losing objects, impulsive behaviors, low academic achievement, and learning difficulty, no obsessive-compulsive symptoms or skin picking	Behavior therapy and psychoeducation Started on long-acting methylphenidate therapy; noted constant skin touching, picking, and squeezing the week of medication initiation Methylphenidate therapy stopped and skin picking behavior decreased but persisted two months later	[9]
8/M	Attention-deficit hyperactivity disorder, low academic achievement, inattentiveness, concentration difficulties without hyperactivity, no obsessive-compulsive symptoms or skin picking Mother had bipolar disorder	Modified release methylphenidate 10 mg/d along with psychoeducation; severe headache and insomnia were reported Patient switched to atomoxetine 10 mg/d and increased to 25 mg/d after no adverse effects for 10 days Follow-up report showed skin picking 2 months after atomoxetine initiation Atomoxetine was discontinued and skin picking stopped	[10]
26/M	Mild intellectual disability, schizophrenia	Trial medication of nocturnal dose of clozapine 25 mg/d increased to 300 mg/d over a period of 2 months with partial relief of schizophrenia symptoms, increased to 350 mg/d for 2 weeks followed by final dose of 400 mg/d, which gave significant reduction in schizophrenia symptoms Starting at dose of 350 mg/d, skin picking was noted, and as dose increased, skin picking increased Skin picking continued and was accepted as a reasonable adverse event given the benefits of clozapine	[11]
51/M	Parkinson's disease, mild depression and anxiety, chronic back pain	Levodopa 500 mg/d, entacapone 1000 mg/d, and ropinirole 3 mg/d for Parkinson's disease Other medications for chronic lower back pain noted as metaxalone, fentanyl patch, and hydromorphone, and for depression and anxiety noted as paroxetine and lorazepamPatient was increased from 2 mg/d ropinirole to 3 mg/d one month prior to visit with reported skin picking; ropinirole then tapered off and skin picking ceased	[12]

The medications that induced dermatillomania or trichotillomania in this study fall into the category of selective serotonin reuptake inhibitors (SSRIs), selective norepinephrine reuptake inhibitors (SNRIs), monoamine oxidase (MAO) inhibitors, and dopamine and noradrenaline agonists. The specific medications seen in this review included fluoxetine, fluvoxamine, paroxetine, venlafaxine, rasagiline, ropinirole, pramipexole, levodopa, methylphenidate, and clozapine.

Skin picking and hair pulling presentations varied between patients. Areas of the body impacted by excoriation included behind the ear as well as on the face, arms, fingers, toes, and scalp. Patients had varied levels of awareness of their excoriation disorders, with one patient describing the behavior as ego-dystonic and another unaware of his own skin picking condition, which was reported by his spouse. Excoriation disorders resulted in bleeding lesions that became increasingly susceptible to infections. Patients reported impacts on functioning or sleep in some cases due to repetitive urge to pick skin or pull hair.

Table 2. Detailed descriptions of excoriation disorders secondary to medication initiation or changes and subsequent interventions.

Age/Sex	Description of Excoriation Disorder	Treatment of Adverse Effect	Citation
5/F	Picking skin behind ear many times throughout day until excoriation	No treatment aside from lessening dose, skin picking persists	[6]
30/F	Skin picking and scratching noted to last 1 h per day on mostly face and upper limbs, which patient perceived as ego-dystonic	Withdrawal from medication	[7]
27/F	Exacerbation of skin picking from less than 1 h per day to 6 h per day and lesion areas expanded from face and arms to include upper back and legs; depth or lesions worsened	Withdrawal from medication	[7]
56/F	Compulsive removal of hair with tweezers leading to superinfected excoriations; perceptions of losing control noted	No treatment or halt of end medication noted, hair pulling persists	[8]
54/F	Excessive removal of hair on chin, leaving bed frequently during the night to spend several hours looking for ingrown hairs, causing many small excoriations with tweezers	No treatment or halt of end medication noted, hair pulling persists	[8]
7/M	Constant skin touching, picking, and squeezing, resulting in bleeding lesions patient continued to touch; child's functioning was decreased with entire day occupied with skin lesions	Withdrawal from medication Citalopram and risperidone were prescribed and no recurrence of skin picking was observed in the 3rd month of follow-up with all lesions healed	[9]
8/M	Skin picking off fingers initially and one week later skin picking on both fingers and toes; skin in these areas was excoriated	Withdrawal from medication	[10]
26/M	Repetitive urge to scratch skin, resulting in a self-inflicted ulcer extending from the upper lips over cheeks Worsening of skin picking and ulcer upon escalation of dose	Escitalopram 10 mg/d resulted in skin picking reduction over a period of 2 weeks	[11]
51/M	Wife noticed skin picking on head that resulted in five erythematous excoriated lesions on frontal scalp of diameter 4 mm and depth 2 mm each Patient denied itching or tactile or visual hallucinations involving the scalp	Withdrawal from medication	[12]

More than half of patients (five patients) discontinued the offending agent with complete relief of dermatillomania symptoms. Of these five patients, one patient's skin picking resurfaced 2 months later, for reasons unknown, despite being off the offending agent. One patient was given a reduced dosage of the offending agent and dermatillomania decreased but persisted. One-third (three patients) continued treatment courses with the offending agent due to necessity and positive results from the medication on other medical issues (Parkinson's disease and schizophrenia). Only two patients were given treatment for dermatillomania excoriation aside from discontinuance of the offending agent. One of these two patients discontinued their offending agent and the other continued theirs. The two treatments used to treat dermatillomania excoriation in this study included a combination of citalopram (an SSRI) and risperidone (an atypical antipsychotic) as well as monotherapy escitalopram (an SSRI). It is noted that some patients experienced excoriation disorders as a side effect of SSRI therapy while others were treated with SSRIs in response to the development of their excoriation disorder. None of the patients followed in this study were

prescribed cognitive behavioral therapy or other nonpharmacological treatments for their dermatillomania or trichotillomania.

4. Discussion

The disorders in this study refer to a subcategory of OCD disorders that are substance- or medication-induced and arose following the intake of a drug. These conditions are very rare and there are few cases published. It is important to note that another common BFRB is onychophagia, or nail biting, but there are no cases of medication inducing this condition to our knowledge, and therefore, it is not discussed in this review.

There is believed to be a genetic component or predisposition to these disorders, as many patients presenting with BFRBs have family members who exhibit OCD symptoms or other mental health conditions such as anxiety. Animal models can be useful for analyzing the genetic component of these disorders. In one study using mice, elevated grooming was seen in the SAPAP3 knockout mouse, which is intriguing considering that variations in SAPAP3 were linked to BFRBs in a recent study [13]. No other potential genetic variations have been identified in the literature review as attached to BFRBs, and therefore, more genetic studies are needed to investigate the heritability of BRFBs and predisposition to the disorders.

Nonpharmacological treatment of dermatillomania and trichotillomania as OCD disorders typically includes one or a combination of the following: cognitive behavioral therapy (CBT), habit reversal therapy (HRT), and psychoeducation [1]. Additionally, competing response training, or performing a separate behavior in response to intrusive skin picking or hair pulling thoughts, can also be a part of CBT and HRT [14]. Psychoeducation is also an important tool, as educating the patient and their family about their disorder and that they are not alone in having the disorder can be helpful in establishing an encouraging environment [14]. Multiple randomized controlled trials have demonstrated significant efficacy of these interventions [1]. It is also important for dermatologists to understand when treatments outside of their scope may benefit patients and know when to refer a patient to mental health professionals for additional treatment.

While there are no Federal Drug Administration (FDA)-approved medications for these disorders, certain pharmacological trials have shown the efficacy of medication as a treatment for dermatillomania and trichotillomania disorders. Impulse-control disorders like dermatillomania and trichotillomania are believed to be caused by deficits in the neurotransmitter systems, implying issues with noradrenaline, serotonin, dopamine, opioid peptides, and glutamate, so medication studies for these disorders focus on these pathways [3]. The first-line treatment of dermatillomania and trichotillomania includes selective serotonin reuptake inhibitors (SSRIs) such as fluoxetine, citalopram, and escitalopram or a tricyclic antidepressant (TCA) called clomipramine [3]. Two trials of the SSRI fluoxetine have shown significant improvements in skin picking behavior, and one of the largest double-blind randomized control trials of an SSRI in excoriation disorder in the current literature (n = 45) found that citalopram significantly reduced the Yale–Brown Obsessive-Compulsive (YBOC) score in patients receiving the medication over the placebo treatment [1]. Another SSRI study following escitalopram showed remission of symptoms in approximately half of the patients, who showed full cessation of skin picking in all measures [1]. A fluvoxamine trial reported that all patients studied had greater control and lessened behaviors relating to their skin [1]. Clomipramine blocks noradrenaline and serotonin reuptake and has been involved in a few small studies that support it as superior to desipramine in the short-term treatment of trichotillomania and dermatillomania [3]. A trial on the glutamatergic agent N-acetyl cysteine (NAC) found significant improvements in the YBOC score for 15 of 32 recipients of the drug [15]. Other pharmacological therapies include lamotrigine and opioid antagonists such as naltrexone, though evidence is limited on the efficacy of these drugs as well [3]. Future studies may also want to look into dupilumab, as this medication is now FDA-approved for prurigo nodularis, a condition of thickened nodules of the skin caused by repetitive itching behavior.

The trend in these cases shows that discontinuance of the offending agent was always successful in the elimination of medication-induced dermatillomania or trichotillomania. Lessening the dose of the offending agent was also seen to lessen, but not eliminate, symptoms. Switching between medications within the same class was seen to be ineffective. This points not to a reaction to the specific formula of the drug, but rather a reaction resulting from the biological pathways of the drug.

Further studies are needed to fully understand the paradox of why SSRIs and atypical antipsychotics may be used to correct BFRBs, when in other cases they are the offending agent that may cause them. The current basic understanding is that a defect in the dopamine and reward axis in the brain causes an imbalance and triggers impulsivity, which has been linked to both high and low dopamine levels [16,17]. These imbalances can be inherited or induced by medication. Eliminating the offending agent or giving an external medication to counteract the deficit can bring dopamine back to its ideal levels and potentially reverse these conditions. Excess serotonin may also cause low dopamine. This would explain SSRIs causing low dopamine and impulsivity in some patients and being able to correct high dopamine and impulsivity in others.

Two patients had trichotillomania secondary to pharmacological therapy for Parkinson's disease. These patients were not able to halt their medications due to the increased quality of life the medication gave them in reducing Parkinson's disease symptoms. It is also hard to identify the true offending agent in these cases as multiple medications are used and many have similar effects on dopamine prolongation in the brain. The medications also may interact with each other to cause a compound effect. Further research on BFRBs as a side effect of Parkinson's medications (rasagiline, ropinirole, pramipexole, levodopa) should be conducted as all these medications are MAO inhibitors and dopamine agonists that potentiate dopamine and, therefore, may increase the potential for impulsive behaviors.

Another patient with schizophrenia continued their offending agent due to the relief of schizophrenia symptoms. In that case, an additional medication, escitalopram, was given, which was able to cease his dermatillomania behavior. This is a positive approach for those who cannot discontinue their medications, rather than leaving the BFRBs untreated and unresolved. It is possible that the clozapine increased dopamine in this case, increasing impulsivity, and that the SSRI treatment increased serotonin enough to decrease dopamine, thus reversing symptoms. It is notable that although four patients did not withdraw from their offending agent, this is the only patient of these four who received an additional medication to handle their continuing dermatillomania or trichotillomania. The other three patients were left with symptoms that may decrease their quality of life without any attempts to improve them. While this review exhibits that the most consistent way to cause cessation of symptoms was stopping the offending agent, this is clearly not a possibility in all cases. This highlights the importance of the previously discussed research regarding pharmacological therapies and their potential positive impacts on dermatillomania and trichotillomania symptoms. Pharmacological therapy was also used in addition to stopping the offending agent in one case of a child with ADHD and dermatillomania secondary to methylphenidate. Remission of all symptoms was seen in this case, which is a reminder that additional pharmacological therapies may be indicated even in those who do discontinue their offending agent. It is also important to note that as different pharmacological agents induced these symptoms, different pharmacological therapies may be required for treatment. Looking at a patient's changing serotonin and dopamine levels as a response to their offending agents may be a good starting place for research on pharmacological therapies.

As previously discussed, nonpharmacological therapies are traditionally used for instances of dermatillomania and trichotillomania in conjunction with medications. However, in this review, no patients were referred to nonpharmacological treatments. This may emphasize the disconnect between dermatologists and other medical providers and mental health providers such as psychiatrists and therapists. It is important that healthcare professionals be informed about interventions that may improve the quality of life for their patients so that they know when to refer patients to these nonpharmacological therapies.

In instances of patients needing to continue their offending agents, nonpharmacological therapies can give patients a chance to improve their debilitating symptoms rather than letting them continue out of necessity for the offending agent. Further studies are needed to analyze the patterns of referrals to nonpharmacological treatments in patients with excoriation disorders.

Currently, there are no FDA-approved medications to treat body-focused repetitive behaviors (BFRBs) such as dermatillomania and trichotillomania. For these reasons, a lot of patients with the disorder go untreated and are left to deal with these uncomfortable intrusive symptoms, as was the case in one-third (three patients) of the patients followed in this review. The research on genetic components related to the disorder is scarce, but there is believed to be a link due to the commonality of OCD or other mental health symptoms in first-degree family members of patients presenting with BFRBs. A lack of research in this field could be due to the limited supply of patients available for study or stigma, and therefore, bringing awareness to the condition is important. A limitation of this study is also related to the lack of patients available, as the sample size in this review is nine patients. The interplay of psychiatric disorders and dermatology is very complex, yet ever-growing. This study highlights a rare but important disorder that is important for dermatologists to understand and acknowledge, as they are likely the first providers that will be alerted of these adverse conditions. It is necessary that dermatologists can identify triggering agents in a patient's medical record, be aware of potential treatments, and know when to reach out to psychiatric colleagues for a multidisciplinary approach.

Author Contributions: Conceptualization, methodology, original draft writing, B.M.T.; review and editing J.M.B.; review and editing, supervision, J.D.M. All authors have read and agreed to the published version of the manuscript.

Funding: This research received no external funding.

Institutional Review Board Statement: Not applicable.

Informed Consent Statement: Not applicable.

Data Availability Statement: No new data were created or analyzed in this study. Data sharing is not applicable to this article.

Conflicts of Interest: The authors declare no conflict of interest.

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