

Delusions of parasitosis: a brief review of the literature and pathway for diagnosis and treatment

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Abstract

A large proportion of patients seen in dermatology practices have underlying psychological issues associated with their skin diseases. One of the most flagrant examples of this are patients with delusions of parasitosis. These patients have false fixed beliefs that they are infested by parasites and experience cutaneous sensations of crawling, biting, and stinging associated with their delusions. There is no organic skin disorder and all cutaneous manifestations are self-induced. Rather than a psychiatrist, the dermatologist is often designated by the patient to handle the chief complaint, even though the main disorder is psychogenic. In spite of their limited evidence, antipsychotic medications have become the mainstay of therapy for delusions of parasitosis. The dermatologist must therefore be familiar with the approach to diagnosis and the use of antipsychotic or neuroleptic medications, which usually reside in the domain. There are few clinical trials and no substantial randomized controlled trials examining the efficacy of the psychiatrist antipsychotic medication used to treat delusions of parasitosis. This review article synthesizes the current available research and distills it down to analyzes 17 case reports, comprising 37 cases, examining the use of risperidone and olanzapine in the treatment of delusions of parasitosis. These findings are synthesized into a clinical pathway designed to assist dermatologists in effectively managing patients with delusions of parasitosis.

Keywords: delusions of parasitosis, Ekbom syndrome, delusory parasitosis, psychogenic parasitosis, delusional infestation, delusional ectoparasitosis,

formication, chronic tactile hallucinosis, parasitophobia.

Introduction

Delusions of parasitosis is a form of somatic delusional disorder in which patients have a cutaneous dysesthesia that causes them to pick at their skin continuously in order to erroneously extract an organism or foreign body they believe is present [1, 2]. These patients have an unshakable belief that their problem is medical and develop elaborate and complex delusional ideations associated with their condition, that cannot be argued with reason [3]. The cutaneous findings that result from these attempts to dig out the suspected parasites range from normal skin to excoriations, picker's nodules and frank ulcerations [4].

An estimated 30-40% of patients seen in dermatology clinics have some psychiatric symptoms [5]. 'Psychodermatology' refers to any aspect of dermatology in which psychological factors play a significant role [2, 6]. These patients require consideration of associated emotional and psychosocial factors for effective management of their skin condition [6, 7].

Patients with delusions of parasitosis are typically resistant to any discussion of their situation in psychological terms because they have no insight into their disease [8]. These patients commonly refuse referral to a psychiatrist, and the dermatologist is thereby designated by the patient to handle the chief complaint, even though the main disorder

is psychogenic [8, 9]. Dermatologists can learn to effectively handle psychodermatologic issues within the limits of their training and practice setting [10].

Epidemiology

The prevalence of delusions of parasitosis has been described as rare, however the exact incidence is unknown [11]. Incidences in the literature vary greatly. In a retrospective study by Marneros et al., 67 cases per 1000 psychiatric admissions were reported [12]. Data collected from outpatient clinics show that incidences can range from a mean of 0.6 [13] to 20 [14, 15] cases per 1000 presentations a year. Again, the reported ratio of male to female incidences is variable, however consistently biased towards females. The male to female ratio has been reported as 1:2 [11, 16], 1:2.2 [17], and 1:4 [12] in retrospective analyses. Interestingly it has been noted that the incidence of female patients appears to be stronger with increasing age [11]. A bimodal age of onset has been described with peak numbers of patients presenting between the age of 20-30 and 50-69 [18].

Clinical Presentation

When considering a diagnosis of delusions of parasitosis, the spectrum of symptoms can be broad. Patients may remain functional and present with a feeling that they are infested, experience the sensation of moving insects in their skin or experience true delusions of parasitic infection that leave them unable to function [19]. Individuals with delusions of parasitosis typically present with a history of symptoms for months or even years [20]. They have often already been evaluated by many doctors and have tried to eradicate their alleged parasites by methods such as using pesticides, hiring exterminators or even changing their residence [21]. Many of these patients can also have tactile hallucinatory experiences that are compatible with their delusion [2]. The most characteristic hallucinatory symptom they may experience is formication, which manifests as sensations of cutaneous crawling, biting, or stinging [2, 3].

These patients often collect 'samples' in bottles, bags, jars, or slides of what is often lint, hair, debris, dead skin, and even common insects found in the home [2, 6, 21]. These specimens are used to provide evidence of the alleged underlying cause of their condition,

referred to as the "matchbox sign" [6, 21, 22]. Skin findings in delusions of parasitosis range from none at all to excoriations, lichenification, prurigo nodularis and frank ulcerations [2, 6, 9]. All of these are self-induced, often resulting from the patient's efforts to dig out parasites.

One intriguing aspect of this disorder is the occurrence of a shared delusional system whereby the patient's close contacts come to believe in the delusion as well. *Folie à deux*, translated to 'craziness for two', is the term used to describe two people who share the same delusion [6, 23]. Interestingly, any number of people can be involved in the delusion [23].

Etiology

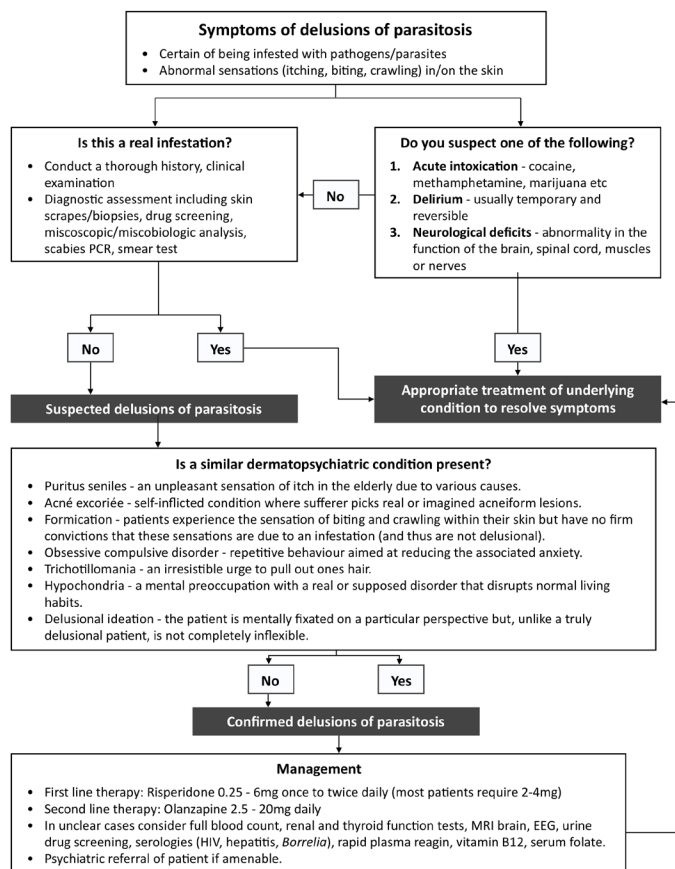
The etiology of delusions of parasitosis is unknown. It has been speculated that sensations such as paresthesia and pruritus initiate the disorder [24, 25]. These sensations are then misinterpreted and become associated with a paranoid idea, forming the basis of the delusion [11]. Another proposed theory is that distressing symptoms can become amplified and perpetuated following newly acquired knowledge or awareness of a disease or public health interest [26].

Huber et al. have proposed the theory that delusions of parasitosis may be related to an excess of extracellular dopamine within the striatum of the brain, due to reduced function of the dopamine transporter [27]. Similarly it is also theorized that over activity of the dopaminergic system in the limbic area of the brain leads to the delusions [28]. The response of many patients to dopamine antagonists lends some support to these theories.

Diagnosis and Differential

The diagnosis of delusions of parasitosis is essentially one of exclusion. In order for the diagnosis of delusions of parasitosis to be made the delusion must be present for at least one month and by definition, not be secondary to any underlying psychiatric or organic disorder [29].

The initial assessment should focus on the patient's primary complaints, eliminating both true infection and an organic disease as causes of their symptoms. A thorough history to elicit symptoms of underlying



Abbreviation: PCR, polymerase chain reaction; MRI, magnetic resonance imaging; EEG, electroencephalogram

Figure 1. Pathway for Diagnosis and Treatment of Delusions of Parasitosis.

disease, and use of prescription and illicit drugs should be obtained. A comprehensive physical examination, looking for findings consistent with underlying conditions should be conducted. Cutaneous symptoms such as ulcers, scratch marks, lichenification and scars may be found where the patient has attempted to remove the organisms from the skin with various objects [1, 2, 30]. These lesions are often absent in the upper back where the patient is unable to reach [2, 4]. Areas of contact dermatitis may be present from excessive cleaning or the use of abrasive soaps or chemicals [22, 30].

Appropriate initial investigations should be obtained, however skin biopsies are rarely required. Negative results, especially from repeated examinations of submitted specimens are adequate in eliminating the possibility of a real parasitic infection. Substance abuse is strongly associated with parasitic delusions. In particular, it is common for cocaine and methamphetamine to cause tactile sensations associated with parasitic hallucinations

[6, 7, 9]. Alcohol use can cause formication during withdrawal [31]. Parasitic delusions have been reported in patients with general medical conditions, such as vitamin B3, B12 and folate deficiency, renal disease, diabetes mellitus, hypertension, thyroid disease, congestive cardiac failure, hepatitis, syphilis, cerebrovascular disease, stroke, multiple sclerosis, pneumonia, tuberculosis, lymphoma, AIDS and pituitary tumors [2, 6, 9, 11, 32, 33]. If any of these diseases are suspected then investigations to confirm or exclude these differentials are warranted.

Follow-up consultations assist in building the doctor-patient relationship and facilitate opportunities for serial examination of skin lesions [7, 9]. During these consultations repeat additional specimens can be obtained or investigations ordered. Repeated assessments may also assist the doctor in deducing whether the patient has a shakable belief rather than a true delusion. Since most patients will not agree to a referral for psychiatric care, long term follow-up with a dermatologist may be most appropriate.

Management

A strong therapeutic relationship with the patient is critical. A sympathetic, non-judgmental approach, acknowledging that the patients' symptoms are real and an empathetic exploration into the effects their symptoms have had on their lives is critical in establishing rapport [21].

Many of these patients cannot be managed by psychiatrists because of their refusal to believe their condition is psychiatric in nature, however if it is feasible at any point to refer to a psychiatrist, the opportunity should be taken. The dermatologist must therefore be willing to use antipsychotic medications so that these patients can receive the treatment they need.

Pimozide, a first-generation antipsychotic, has traditionally been the drug of choice for treating delusions of parasitosis. Data from meta analysis demonstrates a full remission rate of 50% with pimozide treatment, compared with a 30% remission rate in patients treated before pimozide was used [34]; however current research suggest that remission rates are 33% at 5 weeks, and 28% at 5 year follow up [35]. In spite of the reported effectiveness of pimozide,

Table 1.

Effects of Antipsychotic Treatment on Patients with Delusions of Parasitosis				
Study (Year)	SS	Dosage	Outcome	Follow-up
Risperidone				
Huber et al. (2011) [40]	9	1-4mg daily	Complete response in 7 Partial response in 1 No response in 1	NA
		2mg daily	Complete response	Complete remission in 2 weeks and went off treatment for next 2 weeks leading to relapse
Kenchiah et al. (2010) [41]	8	2mg daily	Partial response	NA
		2mg daily	Partial response	Lost to follow up
		2mg daily	Complete response	Lost to follow up at 8 months
		4mg daily	Partial response	Remission remained at one month
		4mg daily	Complete response	Lost to follow up at 2 months
		3mg daily	Partial response	Lost to follow up at 2 months
Nicolato (2006) [42]	1	1mg daily	Partial response	NA
		0.5mg mane, 1mg nocte	No response	NA
Pacan et al. (2004) [43]	1	8mg	Partial response	NA
Kim et al. (2003) [23]	1	3mg daily	Partial response	NA
Kurupparachchi and Williams (2003) [44]	1	Unknown	Complete response	NA
Le and Gonski (2003) [31]	1	0.5mg mane, 1mg nocte	Partial response	NA
Wenning et al. (2003) [37]	1	5mg nocte	Complete response	2 months without relapse
Freyne et al. (1999) [45]	1	0.5-1mg	Complete response	NA
		0.5mg mane, 1mg nocte	Partial response	NA
Safer et al. (1997) [46]	3	1mg daily	Complete response	NA
		0.5mg mane, 1mg nocte	Partial response	NA
Gallucci and Beard (1995) [47]	1	6mg daily	Partial response	NA
Olanzapine				
Dewan et al. (2011) [48]	1	2.5mg	Complete response	Maintained at 3 months
Huber et al. (2011) [40]	2	10mg daily	Complete response in 1 No response in 1	NA

Effects of Antipsychotic Treatment on Patients with Delusions of Parasitosis

Kenchiah et al. (2010) [41]	3	10mg daily	Partial response	Lost to follow-up
		20mg daily	Partial response	Poor compliance. Lost to follow-up at 9 months
		12.5mg daily	Partial response	Lost to follow-up at 6 months
Freudenmann (2007) [49]	1	7.5mg nocte	Partial response	NA
Pacan et al. (2004) [43]	1	20mg	No response	NA

Abbreviation: NA, not available; SS, sample size

its side effect profile makes it potentially problematic as a first line treatment for delusions of parasitosis. Side effects include extra-pyramidal syndrome, QTc prolongation, T wave changes, and the appearance of U waves, which require regular electrocardiographic monitoring [2]. The interaction of pimozide with the macrolide antibiotics (which inhibit CYP 3A4) further precipitates these cardiac side effects, which occurs commonly as many patients often require antibiotics for the treatment secondary cutaneous infections [2].

The development of atypical antipsychotics which have a marked lower incidence of extra-pyramidal syndrome has modified the first line treatment of psychosis and largely replaced the use of first generation antipsychotics. There are few clinical trials and no substantial randomized controlled trials examining the efficacy of atypical antipsychotic medication. The available clinical research surrounding the use of atypical antipsychotics has been established from case reports and summarized in **Table 1**. In spite of their limited evidence however, antipsychotic medications have become the mainstay of therapy for delusions of parasitosis [36]. The goal of therapy should be improvement in the patient's symptoms, and not necessarily cure [36]. Convincing patients to take antipsychotic agents poses another significant obstacle, and even if patients do agree to start medication, adherence may be an issue.

Risperidone is considered by some to be the first line therapy for delusions of parasitosis [2, 37]. Risperidone has been effective for some patients who have failed therapy with haloperidol and pimozide [2, 37]. Serotonin is felt to play a significant role in psychosis, and risperidone preferentially

blocks serotonin receptors while still maintaining some activity against dopamine receptors. Between 0.25mg and 8 mg daily, administered in one or two doses, are required for clinical response [38], although most patients require 2-4 mg [2]. A possible increased risk of cerebrovascular accidents in dementia patients receiving risperidone has not been reported in patients with delusional disorders [39]. Olanzapine at doses of 2.5 to 20 mg daily also appears to be as effective as risperidone, but its use has been reported less frequently [2].

Discussion

Delusions of parasitosis is a rare but treatable disorder. Dermatologists are often the first specialist who encounter these patients, and when a diagnosis is made, should strongly consider starting antipsychotic therapy to achieve the best possible outcomes. Delusional parasitosis was previously considered a progressive disorder with only a 10-30% chance of spontaneous remission [27], however atypical antipsychotic therapy has resulted in markedly improved outcomes.

Conclusion

True infestation and underlying causes should be ruled out by careful history, physical examination and laboratory investigations where appropriate. A referral for psychiatric assessment and management should be considered in these cases, however it is often refused. With appropriate treatment, clinical improvement and long-term remission are possible. The findings and recommendations of this article have been summarized into a clinical pathway (**Figure 1**) to aid the dermatologist in the diagnosis and management of delusions of parasitosis.

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