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PRACTICE

PRACTICE POINTER

How to approach delusional infestation

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Delusional infestation (previously also known as delusional parasitosis or Ekbom's syndrome) is a rare disorder, but it commonly poses disproportionate practical problems to healthcare systems.¹ It is characterised by a patient's fixed belief that his or her skin, body, or immediate environment is infested by small, living (or less often inanimate) pathogens despite the lack of any medical evidence for this.¹ Delusional infestation is neither a single disease nor a single diagnostic entity. The classic form, primary delusional infestation, develops without any known cause or underlying illness and meets criteria for a persistent delusional disorder (ICD-10 (international classification of diseases, 10th revision)) or delusional disorder somatic type (DSM-5 (*Diagnostic and Statistical Manual of Mental Disorders*, fifth edition)). Approximately 60% of patients, however, have secondary forms of delusional infestation² that occur in the context of substance misuse (such as cocaine, amphetamines, cannabis), dopaminergic medications, antibiotics, or during physical or psychiatric illnesses (such as delirium, dementia, depression, schizophrenia, stroke, and other medical conditions that affect the brain or cause pruritus).^{1,2}

The neurobiology of delusional infestation is not fully understood. Studies point to dysfunction or structural brain damage in the frontal cortex, the dorsal striatum, parietal and temporal cortex, and the thalamus—that is, brain areas involved in judgment, body sensation, and learning.³ This supports the hypothesis that the delusional beliefs are the result of disturbed basic learning processes and of errors of probabilistic reasoning (favouring the unlikely explanation over the likely).⁴

How does delusional infestation present?

Patients complain about being infested with known pathogens such as insects or worms, or pathogens hitherto unknown to medical science (such as “Morgellons,” fibres, or strands).^{5,6} Additional symptoms are abnormal sensations on or underneath the skin (itching, stinging, biting), which patients explain by pathogens living, eating, breeding, and building nests in their body. The alleged infestation often includes the patient's

immediate environment (room, house, car, etc). Patients often spend hours each day examining the alleged pathogens and trying to catch them; if “successful,” they often take or send specimens of these pathogens to physicians or laboratories as proof of infestation. This phenomenon is called “the specimen sign.”^{1,7} It is not sufficient to diagnose delusional infestation, and case series report frequencies between 29% and 74%.^{6,8} The search for the pathogen can absorb much of a patient's time and puts a huge disease burden on patients and their families.

Sometimes the delusional belief spreads to significant others as a shared psychotic disorder (5-15%,² 4%,⁷ 26%⁹). Rarely, delusional infestation also occurs as a proxy syndrome—that is, a person (who is the real patient) assumes symptoms of delusional infestation in his or her children or pets but does not complain about being infested him/herself. In double delusional infestation, patients complain of symptoms in addition to symptoms in a child or pet.¹⁰

How common is delusional infestation?

Delusional infestation is rare, with an incidence of 1.9 in 100 000 person years, but recent studies indicate a growing frequency.¹¹ It occurs in all ages, but middle aged and older women prevail (with the exception of delusional infestation induced by illicit drugs in young men).^{2,7,9,11}

How is delusional infestation diagnosed?

Delusional infestation is a diagnosis of exclusion. The starting point is usually a patient with a fixed conviction of being infested, for whom we suggest the following approach:

- Ask why the patient is convinced that they are infested and with what. Explore how fixed this belief is—would they consider alternative explanations for their symptoms?
- Distinguish these beliefs from formication (the sensation of insects crawling on or underneath the skin), which is a

The bottom line

- Consider delusional infestation in patients who present with a fixed belief that they are infested with living or non-living organisms in the absence of medical evidence for this
- Always exclude real infestations first, with examination, review by a dermatologist or infectious disease specialist, and appropriate tests
- Acknowledge the patient's distress without reinforcing false beliefs
- Most patients require antipsychotic treatment (amisulpride, olanzapine, or risperidone), which may be offered as a means to alleviate symptoms
- Management ideally requires a multidisciplinary approach, but, as patients rarely agree to full psychiatric assessment, physicians who have engaged patients in a trusting relationship should offer medication, if possible with psychiatric advice

Methods

This review is based on a comprehensive review of the subject we published in 2009¹ and other publications since. The evidence primarily comes from analyses of case series, prevalence, and imaging studies.

known symptom of menopause and is not accompanied by fixed delusions.

- Exclude real infestations in all cases, even if a patient's bizarre explanation of the symptoms makes delusional infestation easy to recognise.¹ Examine the patient and any specimens they bring. Rigorous exclusion of an infestation by a dermatologist or infectious disease specialist is usually indicated.
- Check for triggering or contributing factors. For instance:
 - Ask about recent new medication (especially antibiotics or stimulants) and drug use. Formication without delusional infestation may occur in acute intoxication with stimulants ("cocaine bug"), in which case it subsides with haloperidol or spontaneously when the intoxication ends.
 - Ask about symptoms of anxiety and depression, which commonly coincide.¹² Consider other psychiatric conditions, such as dementia with delirium or schizophrenia.
 - Consider medical and neurological conditions, especially if they cause itching, as they may lead the patient to develop delusional infestation. These include diabetes, cancer, stroke, and thyroid diseases.
- Request investigations that a dermatologist or microbiologist would find reasonable and necessary.
 - Some laboratory tests are mandatory: full blood count, especially to look for raised eosinophils (suggesting parasitosis or other infection, allergy, or hypersensitivity); erythrocyte sedimentation rate; C reactive protein; serum creatinine and electrolytes; liver function; thyroid stimulating hormone; fasting glucose; and ideally urine analysis to test for illicit drug use.
 - In some clinical contexts consider other tests, such as serology for borrelia, treponema, hepatitis, and HIV infection; vasculitis screening; allergy testing; vitamin B12 and folate levels.

If all investigations are uneventful and the patient has the defining symptoms of a delusional illness, the diagnosis of delusional infestation can be made. In this case stop further investigations in order not to reinforce the delusion, except for additional specimens the patient may bring.

What is the next step?

Organising meaningful psychiatric treatment in this patient group is often challenging, because most patients will not accept the possibility of a psychiatric problem. Delusional infestation

requires management strategies that differ from other psychiatric disorders to help these patients. Observational data suggest that specialised outpatient clinics where a psychiatrist and a dermatologist or tropical disease physician see the patient together can achieve good adherence.¹³ However, this would require further investment, as few such services exist worldwide.^{1 12 13} Because of patients' reluctance to see psychiatrists, it will mostly fall to general practitioners or dermatologists to have the discussion about the nature of the symptoms with a patient and cautiously discuss effective treatment options. The doctor who first sees the patient may want to discuss the case with the local psychiatric team to establish the diagnosis, develop a treatment plan, and start drug treatment.

Engage the patient when discussing the condition and its management

This is essential in any setting and for any form of delusional infestation, using an empathic and non-judgmental approach.^{1 14 15} Box 1 outlines useful ways to do so.

Engage relatives or friends, with the patient's consent

This can be useful in reinforcing treatment aims and interpretation of symptoms for the patient.

Risk assessment

Patients may put themselves or others at risk with the use of chemicals on their skin or because of suicidal ideation. This requires appropriate risk assessment and sometimes the use of involuntary admissions under mental health legislation according to local laws. Look for signs of depression and suicidal ideation.

Evaluate risk to others:

- "Do you think your child(ren) are infested?"
- "Are there other people close to you who think they are infested or that you think are infested (although doctors failed to find a pathogen)?"

As with any chronic condition, patients with a long history of delusional infestation may develop psychological sequelae such as depression or anxiety, which may benefit from early recognition and support from local primary care services.¹²

Which medications should we use?

Transient episodes of delusional infestation, such as during intoxications or delirium, may subside spontaneously. Delusional

Box 1: Discussing delusional infestation and its management with patients^{1 15 16}

- Acknowledge the patient's suffering (such as, "I can see these symptoms are distressing you"). Show empathy and offer to help to reduce distress.
- Paraphrase the symptoms ("your itch(ing)," "the sensations," "the crawling on your skin," etc.) instead of reinforcing them (such as "being infested") or questioning them.
- State that you did not find any pathogens so far, but you are sure that the patient really suffers from his or her perceptions.
- Explain that "The itching may be due to an over-activity in the nervous system, which can give people persistent symptoms after real infestations."
- You may want to "agree to disagree"; this means you acknowledge that the patient has the right to have a different opinion to you, but also that he or she shall acknowledge that you have the same right. You may want to say: "I'd like to find out what causes your symptoms, but we need to keep an open mind. Possible options include an infestation, a medical illness, or psychological illnesses."
- You may want to introduce antipsychotics as helpful in alleviating the patient's distress and itching (due to the antihistaminic component of many antipsychotics), explaining that it is not given for schizophrenia: for example, "I can see that you are suffering. Would you like me to prescribe something that may help you feel a bit calmer? I know you do not suffer from schizophrenia, but in our experience these medications can be useful to relieve suffering/itching/distress in patients with problems like yours."
- Do not use phrases such as "calm down," "be happy it's not infectious," "it is only psychogenic," etc, after obtaining negative laboratory tests for infectious processes; these are likely to upset the patient.
- Do not directly reinforce the patient's (false) beliefs. Do not say "Yes, I found [an infestation]" (although you have not) or "Try this worm cure" (although there are no worms).

infestation associated with prescribed or illicit drugs usually abates when the substance is stopped.

For persisting symptoms such as primary delusional infestation or schizophrenia, we advise treating with antipsychotics. In psychotic depression manifesting as delusional infestation, antidepressants plus antipsychotics are recommended.¹ However, no modern antipsychotic is specifically licensed for treating delusional infestation.¹ There are no guidelines and no clinical trials that meet today's standards, because full informed consent is usually impossible to obtain.¹

Limited evidence from case series suggests using low doses of risperidone (1-2 mg daily), olanzapine (2.5-5 mg daily), amisulpride (200-400 mg daily), or haloperidol (2-5 mg daily).^{8 14} Risperidone and olanzapine achieved full or partial remission in 69% and 72% of cases, respectively.⁸ However, we lack head to head comparisons with larger samples.

Antihistaminergic antipsychotics such as quetiapine have shown disappointing results. First generation antipsychotics may lead to more full remissions than newer antipsychotics.¹⁷ However, we cannot recommend pimozide for reasons of drug safety, especially because of problems with postural hypotension, extrapyramidal side effects, and QT prolongation.^{1 8 14 17}

The best way to approach antipsychotics with patients is by discussing them as a means to relieve distressing symptoms (box 1). Make clear that, while these drugs are also used for schizophrenia, there is no suggestion of this diagnosis in this patient. We recommend a comparison with other medications such as aspirin, which can be given for pain and also in cardiovascular conditions.

You may want to discuss medication choices with your local psychiatrist. Response often begins within two weeks.⁸ Skin lesions are treated symptomatically. Superinfections are common and may need dermatological treatment in their own right. No evidence exists on the use of psychological therapies to enable any treatment recommendations.

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How patients were involved in the creation of this article

- We approached patients from the Liverpool "Joint Clinic" and the Bruneck Centre for Mental Health, Italy, where many patients with delusional infestation are seen
- We have integrated their responses and priorities into our recommendations