

## Successful Treatment of Delusional Infestation with Olanzapine Depot

### ABSTRACT

Delusional infestation (DI) is a rare psychiatric disorder characterized by a persistent false belief that one is infected with nonliving or living pathogens, usually accompanied by formication. Other psychotic features, such as disorganized speech or hallucinations unrelated to the core delusion itself, are never present, and the delusional belief does not extend into other areas of life. Secondary DI, when one needs to address the underlying condition in order to achieve adequate treatment, is also possible. We present the case of a 42-year-old male with a 2-year history of having a persistent and firm belief that his house was infested with tiny insects that were constantly biting him and laying their eggs under his skin. His delusional belief was preceded by a complex, years-long substance use disorder, which confronted us with a differential diagnostic dilemma between primary and secondary DI. He was successfully treated with olanzapine pamoate depot, which was introduced to address his lack of insight and unsatisfactory compliance, and his delusion faded away after his symptoms subsided.

**Keywords:** Delusional, parasitosis, substance-related disorders, olanzapine, delayed-action preparations

### Introduction

Delusional infestation (DI) is a rare psychiatric disorder classified in the Diagnostic and Statistical Manual of Mental Disorders-5 (DSM-5) as a delusional disorder of the somatic subtype. It is characterized by a fixed, false belief that one is infected with nonliving or living pathogens such as fibers, insects, or parasites persisting for at least 1 month.<sup>1</sup> Although frequently seen by primary care providers, patients usually refuse the psychiatric referral and, depending on the nature of their delusional belief, seek help from other specialists instead. Dermatologists, infectologists, and ophthalmologists are often included, not only because of the character of a delusional belief but also as a result of complications arising from the patients' own attempts at eradicating their perceived infestation.<sup>2,3</sup>

The delusion of an infestation is, as a rule, isolated and does not extend into other areas of life. Auditory, visual, and tactile hallucinations related to the core delusion may be present, albeit without other psychotic features, for example, catatonia, disorganized speech, or other hallucinations unrelated to the core delusion itself. The delusion of infestation secondary to an underlying medical or psychiatric condition accounts for approximately 60% of patients and should be, if possible, clearly distinguished from primary DI since reversible medical conditions or suspicious medications need to be addressed in order to achieve adequate treatment.<sup>4</sup>

What we now know as DI was initially described by a French dermatologist Thiebière in 1894, when he coined the term *acarophobia*, and further defined by a Swedish neurologist Ekbohm in 1938, when he suggested the term *präsenile Dermatozoenwahn*, which later came to be known as Ekbohm syndrome<sup>5</sup> and, after 1946, as delusions of parasitosis. In order to be more accurate and account for the nonliving pathogens reported by one-sixth of the patients, the term *delusional infestation* was introduced in 2009 and became widely accepted over the last decade.<sup>6-8</sup>



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## Case Presentation

We examined a 42-year-old male hospitalized at the University Psychiatric Hospital Vrapce. The patient presented with complaints of small insects that had infested his house and were constantly biting him. Past medical history included substance use disorder, with a 20-year history of heroin abuse and daily cannabis abuse worth pointing out, and one grand mal seizure after polysubstance use 4 years ago. He had 1 short psychiatric hospitalization at the Neuropsychiatric Hospital "Dr. Ivan Barbot" 12 months ago when he had similar insect-related complaints. He was treated with buprenorphine (24 mg/d) and sodium valproate (500 mg/d). His father reported that the patient had suffered from sporadic episodes of severe agitation and increasingly worsening insomnia while complaining of an insufferable bug infestation over the last 2 years. He had visited more than 20 dermatologists in an attempt to find relief and had even collected the insects he supposedly pulled out of his nose and eyes (the so-called specimen sign, also known as the match-box sign).<sup>8,9</sup> On the day prior to admission, the patient had suffered a nervous breakdown, becoming extremely agitated and verbally aggressive toward his household. He complained he could not see anything because his eyes were infested with insects. As his suffering became unbearable, he even threatened to commit suicide, saying he can no longer withstand these bugs that are literally eating him up and laying their eggs under his skin. He tried to remove the eggs before they hatched, scratching his skin violently, which resulted in numerous excoriations.

The patient had severe psychomotor agitation on mental status examination and was noncompliant, hostile, and suspicious. He seemed dissimulative, and tactile and visual hallucinations were suspected. He stated that his house was infested with minuscule flies that looked like "no-see-ums," which attacked only him because of his blood type. In an effort to eradicate them, he had the whole house disinfested on several occasions, which resulted in brief periods of peace when his symptoms almost completely receded, only to reappear in full force shortly after. As definite proof, he revealed multiple bite marks that turned out to be moles. Despite his lack of insight, the patient accepted treatment and provided full written informed consent. In addition, an appropriate ethics committee approval has been obtained for this case report, as well as the patient's written consent for its publishing.

### MAIN POINTS

- *Delusional infestation (DI) is a rare psychiatric disorder characterized by a persistent false belief that one is infected with nonliving or living pathogens.*
- *Due to their lack of insight and consequent unsatisfactory compliance, patients suffering from DI are often difficult to treat.*
- *Second-generation antipsychotics (SGA), most notably risperidone and olanzapine, are the treatment of choice for DI.*
- *Long-acting SGA depot preparations provide a useful option to combat covert non-adherence in DI, potentially resulting in better outcomes.*
- *This case report was the first, to our knowledge, to demonstrate the successful utilization of olanzapine pamoate depot in the treatment of DI.*

A physical examination revealed an asthenic constitution and excoriations. Routine laboratory tests, a multislice computed tomography scan of the head, and an electroencephalogram showed no abnormalities. A urine drug screen detected benzodiazepines, buprenorphine, and tetrahydrocannabinol. The psychological assessment revealed very superior intelligence with elements of organic brain dysfunction.

A differential diagnostic dilemma between primary DI and DI secondary to an underlying substance use disorder remains open regarding the relatively abrupt onset of this single delusional belief coinciding with complex years-long substance use.

The patient was initially treated with risperidone, diazepam, and sodium valproate and had a significant reduction in psychomotor symptoms within a couple of weeks, as well as somewhat better compliance. Nevertheless, he remained ambivalent about the need for psychiatric treatment and reported that he did not see much improvement. After switching from risperidone to olanzapine, the patient reported a greater overall improvement and agreed to switch to olanzapine pamoate depot (300 mg/4 weeks), which had been suggested because of his less than ideal compliance. After 1 month of follow-up, he complained of worsened mood, which improved after bupropion was added to the treatment. As for his delusional belief, he reported that he was not having any problems with the insects since he returned home, although he was not sure whether it happened as a result of the treatment or simply because they moved somewhere else.

## Discussion

Excess dopaminergic activity in specific regions of the brain, presumably caused by a decreased activity of the dopamine transporter, has been suggested to be the main pathophysiological mechanism involved in the etiology of DI as it is in other psychotic disorders.<sup>2</sup> With their activity being in large part antidopaminergic, the well-established efficacy of antipsychotics in the treatment of DI supports this hypothesis.<sup>10</sup> On the other hand, the anti-histaminergic component helps alleviate the patient's itching.<sup>4</sup>

Although first-generation antipsychotics (FGA), such as pimozide, used to be recommended as the treatment of choice for DI, increasing concerns about their safety have pushed them out of favor in recent years. On top of that, pimozide as a treatment option is not available in our country. This is why we decided on second-generation antipsychotics (SGA), as they have equal efficacy and provide improved safety profile and better tolerability, which results in better adherence to therapy, thus improving patient outcomes.<sup>10</sup> According to the current literature, which has no large experimental trials and comprises mainly of level 4 and 5 evidence, there is no substantial evidence that risperidone is a better treatment option than olanzapine.<sup>11,12</sup> Although low-dose risperidone (0.5-2 mg/day) is the treatment of choice for DI, low-dose olanzapine (2.5-12 mg/day) proved to be equally effective,<sup>2,3</sup> while several case reports have reported successful utilization of aripiprazole,<sup>3</sup> for example, for DI secondary to dementia with Lewy bodies.<sup>13</sup>

When investigated, both risperidone and olanzapine had the same number of patients achieve a 50% reduction in the Positive and Negative Syndrome Scale baseline score<sup>11</sup> or some degree of

improvement.<sup>12</sup> Furthermore, the available literature shows that 49.3-60% of patients achieve recovery using SGA.<sup>11</sup> As a treatment option, the discussion between risperidone and olanzapine is primarily driven by their side effects.<sup>11,12</sup> In our case, the patient had a partial response to risperidone, which is the case in a substantial number of patients,<sup>11</sup> and showed extra-pyramidal side effects when we started to increase the dosage. Since he wasn't compliant from the beginning, and long-lasting treatment is required for the long-term treatment of DI, we decided to use long-acting injection (LAI) treatment. Both risperidone and olanzapine are available in LAI formulation. Although paliperidone is effective in DI,<sup>14</sup> the risk of extra-pyramidal side effects and tardive dyskinesia outweighed the risk of metabolic syndrome, which is the main side effect of LAI olanzapine.<sup>11,12</sup>

Since the human mind has a unique place in the subjective human experience, the intimate and personal relationship between the subject and his mind has placed psychiatry in a unique position among other medical specialties while posing distinct challenges to the therapeutic process, with patient compliance being somewhat notorious in that regard. This problem is further complicated by the stigma associated with psychiatric disorders.<sup>15</sup> For the reasons mentioned previously, and often coming with considerable side effects, psychiatric medications, antipsychotics especially, have been associated with less than satisfactory patient adherence.<sup>16</sup> For the aforementioned reasons, a strong therapeutic alliance forms the backbone of successful treatment and forms the gateway to the successful utilization of psychopharmacotherapy. Building a strong therapeutic alliance might prove to be the most challenging part of the treatment and requires considerable skill. One cohort study found that 30% of patients suffering from DI tested positive on a urine toxicological screening, indicating either an attempt to self-medicate distressing symptoms or the etiological relationship, which would be more likely if one was abusing dopaminergic drugs, such as stimulants.<sup>17</sup> A high prevalence of treatment compliance problems in psychiatric patients with comorbid substance use disorder has been reported, more frequently earlier in the course of the treatment, potentially resulting in its early termination.<sup>18</sup> From that perspective, our patient appears to be burdened with an unfortunate constellation of clinical features that could explain his treatment compliance problems. Another study, which sampled a cohort of patients with DI, reported that the adherence to prescribed dermatological medications was high when compared with psychotropic agents, which was attributed to the patients' own perception of their condition as well as to the secondary non-adherence resulting from the associated side effects.<sup>19</sup>

Depot antipsychotics provide a useful option to overcome the problem of covert non-adherence and have, as a result of smaller amplitudes of plasma concentrations, fewer side effects. Hoping to achieve better adherence, intramuscular application of FGA depot was first suggested as an effective treatment approach for DI in 1979,<sup>20</sup> while the first successful utilization of SGA depot was reported in 2015, when paliperidone depot was successfully used as a maintenance treatment in DI secondary to schizophrenia.<sup>21</sup>

As discussed earlier, we opted for an olanzapine pamoate depot, which proved effective in achieving stable remission and better compliance, which was critical in the early phase of the treatment.

To the best of our knowledge, this is the first case report that demonstrated the effectiveness of olanzapine pamoate depot in the treatment of DI and the only case report, alongside the aforementioned case report from 2015,<sup>21</sup> which used paliperidone depot, to demonstrate the effectiveness of any SGA depot in the treatment of DI.

**Informed Consent:** Written informed consent was obtained from the patient.

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