

A Review of Delusions of Parasitosis, Part 1: Presentation and Diagnosis

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GOAL

To understand delusions of parasitosis (DOP) to better manage patients with the condition

OBJECTIVES

Upon completion of this activity, dermatologists and general practitioners should be able to:

1. Identify criteria for diagnosing DOP.
2. Describe features associated with DOP.
3. Discuss possible causes of DOP.

CME Test on page 136.

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Delusions of parasitosis (DOP), a psychiatric disorder in which patients erroneously insist that they are infested with parasites, remains a fascinating entity with elusive origins. Typically, these patients are resistant to psychiatric referral

and treatment with psychotropic medications. We discuss the classification, epidemiology, clinical presentation, etiology, associated features, and differential diagnosis of this disorder. The authors reviewed case reports and clinical trials and tabulated the epidemiologic data, which show DOP is more common than previously thought.

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Delusions of parasitosis (DOP) is a disorder characterized by patients who erroneously insist that they are infested with parasites. The disorder is encountered by physicians in a wide variety of specialties, including dermatology, family practice, infectious disease, internal medicine, and psychiatry,

yet its etiology and impetus for affecting some patients and not others remain unclear.

Classification

Delusions of parasitosis has been referred to by many names over the years, including parasitophobia¹ and acarophobia²; delusions of dermatozoiiasis, dermatophobia, entomophobia³; parasitophobic neurodermatitis; Ekbom syndrome⁴; and most recently, Morgellons disease.⁵ According to the *Diagnostic and Statistical Manual of Mental Disorders* (Fourth Edition), DOP is considered a form of psychosis.⁶ Specifically, it is classified as a delusional disorder of a somatic subtype. It is distinguished from paranoia, a disorder in which patients know their fear is irrational.⁷ Instead, DOP is a fixed false belief of infestation. This belief is nonbizarre; it is conceivable that a person could, in theory, have a parasitic infection.

To diagnose DOP, patients must meet the following criteria: (1) a delusion of at least 1 month's duration; (2) no prior diagnosis of schizophrenia⁸; (3) psychosocial functioning is not impaired other than directly by the delusion; (4) if a mood disorder coexists, the mood disturbance is shorter in duration than the delusion; and (5) the delusion is not caused by substance use or another medical condition.⁶

Delusions of parasitosis also can be classified as monosymptomatic hypochondriacal psychosis, a term used to emphasize that DOP, among other disorders of this type, is encapsulated. Patients with DOP often are perfectly appropriate in behavior and logic in all other aspects of life.² However, they have this single, firm, persistent delusion of infestation. Patients with other psychotic disorders, such as schizophrenia, usually have other psychological signs, such as blunted affect and auditory hallucinations, in addition to their delusions.⁹ Patients can present with parasitic delusions caused by an underlying organic disorder, but they are not true cases of DOP.

Epidemiology

While the prevalence of this disorder is unknown, it has been described in the literature as rare.¹⁰ However, many researchers have speculated that the prevalence is indeed greater than initially suspected.^{8,11-13} A retrospective study at the University of Cologne, Germany, reported a prevalence of 67 cases per 1000 psychiatric admissions.¹⁴ Various authors have reported incidences in their clinics averaging from 0.6 to 20 cases per year (Table).¹⁵⁻²¹

The overall prevalence is difficult to assess because the disorder may be referred to by different names; physicians of some specialties will see more cases than others; certain physicians will get

more referrals than others based on their history of treating DOP; and while an inpatient population is most easily studied, most patients with DOP are seen on an outpatient basis. Furthermore, physicians depend on the unreliable method of self-reporting to identify this disease. Because infestation is socially unacceptable, patients may be embarrassed to report their symptoms, fearing judgment on their socioeconomic status, hygiene, and mental health. Delusions of parasitosis may be more prevalent in areas where infestation is more commonplace and, consequently, considered a more acceptable diagnosis. Srinivasan et al¹⁹ discuss this phenomenon in India.

The female to male ratio has ranged from 2 to 1 in 2 UK surveys,^{10,22} to 2.2 to 1 in a tabulated series,³ to 2.8 to 1 in a single study of 57 cases,²³ to 4 to 1 in a retrospective analysis of 20 cases.¹⁴ Furthermore, female predominance is reported by Lyell¹⁰ to be stronger at an older age. The mean age of onset ranges from 50 to 69 years. A bimodal distribution with some patients presenting in their 20s or 30s also has been described.⁸ Folie à deux, a delusion shared by another person, was estimated to occur in approximately 8% to 10% of patients (in studies with >100 patients).^{10,24} The authors reviewed demographic data from 61 articles published on this topic.^{3,10,15-21,25-76} Delusions of parasitosis was reported in 150 females and 82 males (a 1.8:1 ratio of females to males). The mean age of onset was 57.9 years, with 59.2 years for females and 55.5 years for males. Of cases in which data were available, 11% (16/150) reported evidence of folie à deux and 50% (63/128) presented with proof of infestation. Of 95 cases reported, 34% (32/95) presented to dermatologists and 29% (28/95) presented to psychiatrists (Figure).

Clinical Presentation

The classic patient with DOP is a middle-aged woman frustrated by unsuccessful attempts to discover the cause of her ailment that has been affecting her for months or years. She has probably presented to many physicians in different specialties. She has the unshakable belief that she is infested. She may believe she is infested by a specific insect and even describes the color or shape of the bugs. Despite the lack of clinical evidence, she may claim to actually see the bugs crawling on her⁷⁷ and feel the sensation of biting or burrowing under the skin (formication). She will commonly bring in proof of infestation, such as visible particles on clear tape or in little plastic bags, which is called the matchbox sign because patients, as described in older literature, brought their evidence in matchboxes. A more recent report appropriately suggested modernizing the term to the *Ziploc*[®] sign.⁷⁷

Reported Incidences of Delusions of Parasitosis

Specialty	Location	No. of Cases Per Year, mean	Reference
Entomology	Los Angeles Department of Health, California	20	Schrut and Waldron ¹⁵
Psychiatry	Outpatient Clinic, Budapest, Hungary	20	Ungvari and Vladar ¹⁶
Psychiatry	Outpatient Clinic, Delhi, India	6.1	Bhatia et al ¹⁷
Psychiatry/ Dermatology	Outpatient Clinic, Allahabad, India	5.8	Tandon ¹⁸
Psychiatry	Outpatient Clinic, Madras, India	4.8	Srinivasan et al ¹⁹
Psychiatry	Private Practice, Dublin, Ireland	2.7	Sheppard et al ²⁰
Dermatology	Division of Dermatology, National University Hospital, Singapore	0.6	Aw et al ²¹

Upon examination, the particles are nothing more than skin scrapings, lint, or other nonparasitic materials. Frequently, the patient presents with neurotic excoriations or inflammation secondary to scratching or self-prescribed treatments for the infestation, such as abrasive cleaning agents.

Despite thorough examination and reassurance by the physician that there is no infestation, the patient clings to his/her beliefs. These patients rarely will accept psychiatric referrals despite the fact that psychiatrists are best trained to deal with delusional disorders.

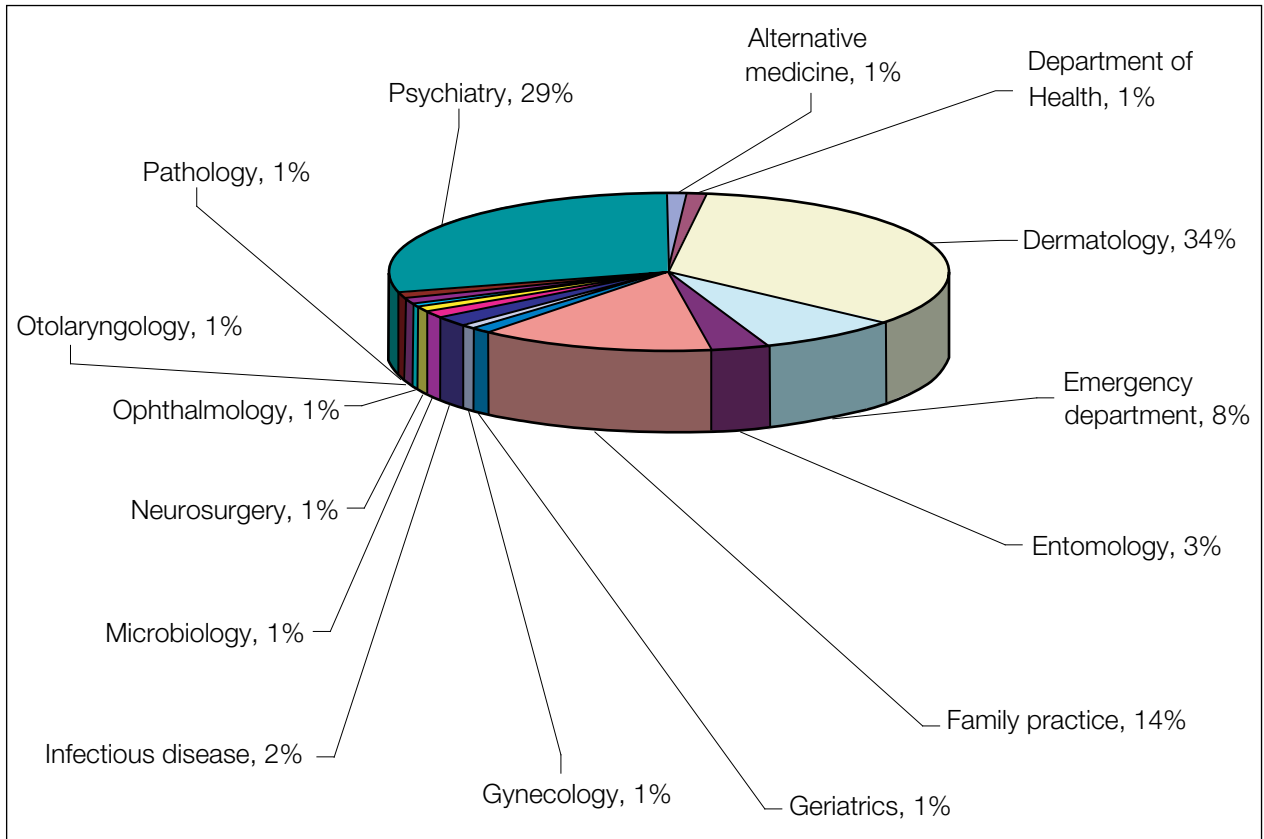
Etiology

The etiology of DOP remains unknown. It has been speculated that an actual sensation, such as a paresthesia or other pruritus, initiates the disorder,^{78,79} which would be especially more common among older patients. As the skin becomes more prone to idiopathic pruritus, the nervous system is less adept at interpreting these sensations.⁸⁰ Subsequently, a real sensation is misperceived and becomes associated with a paranoid idea; from this nidus, a delusion is born.⁶² Johnson and Anton⁸¹ have suggested that pimozide, an antipsychotic, is effective for patients

with DOP because of its antipruritic effects mediated through opiate agonism. Pimozide has activity similar to morphine and fentanyl citrate. A controlled trial clinically linked opiate receptor agonism to DOP.⁸² Fentanyl citrate, an opiate agonist, exaggerated complaints in a patient with DOP but induced euphoria in the control group. Naloxone hydrochloride, an opiate antagonist, alleviated DOP symptoms and caused euphoria in patients with DOP, while the control group reported dysphoria. All changes reverted back to baseline with discontinuation of the drugs.⁸²

Another theory attributes DOP to overactivity of the dopaminergic system in the limbic area of the brain, much like schizophrenia or drug-induced psychosis,^{83,84} which would explain the sensitivity of the delusions to pimozide, a very specific dopamine blocker. A hypothesis of thalamic involvement also exists.⁸⁵ It has been suggested that delusions are, in fact, somatic manifestations of underlying anxiety. For patients, the idea of infestation is easier to address and becomes a coping mechanism to avoid facing the real issues that disturb them.^{15,80}

Because of the similarity between symptoms of lysergic acid diethylamide ingestion and monosymptomatic hypochondriacal psychosis, or DOP, it has



Practitioner variability in presentation of delusions of parasitosis (N=95).

been postulated that serotonin receptors may play a part in causing symptoms. Furthermore, pimozide is known to have 5-hydroxytryptamine₂ receptor-blocking capabilities.⁸⁶

De Leon et al⁷⁹ postulated that the suggestible nature of infestation (ie, folie à deux) is caused by the contagious nature of scratching, ease of proving infestation versus another delusion, and the ancestral fear of parasites.

Associated Features

While DOP is associated with many medical and psychiatric conditions, it is important to reiterate that it is a primary disorder and not a consequence of another general medical or psychiatric condition.^{11,14}

Interestingly, in one study, the prevailing psychiatric symptom was misidentification (misidentifying a stimulus) in 65% of patients with DOP compared with 11% of patients with late-onset schizophrenia and 8% of patients with organic mental disorders caused by cerebral arteriosclerosis.¹⁴

Many patients report a previous history of skin disorder including previous infestation. They might have complained of some abnormal skin sensation, pruritus, or paresthesia.^{10,14,62}

There is mixed evidence classifying patients with DOP as loners,^{14,63,64,83} though social isolation is common and often may be secondary to the delusion.

There is further evidence suggesting that patients with DOP have a lower than average socioeconomic status.^{18,83} According to a detailed and intensive psychological study of 5 cases, DOP seemed to be associated with an average intelligence.⁶⁵

Diagnosis and Differential

Before making the diagnosis of DOP, the delusion must be present for at least one month. It is most important to rule out actual infestation, as an editorial in *Lancet* quips, “Do look in the matchbox. It may contain real parasites.”⁸⁷ One must rule out an actual infestation before assigning the diagnosis of DOP, as parasites such as head lice are ubiquitous.

A group of psychiatrists from Austria set out to discover the distribution of all patients presenting with DOP.⁸⁸ They classified 34 patients into groups based on etiology. Of these patients, 47.1% (16/34) were classified as having a delusional disorder (ie, true DOP as an independent entity). Based on their own study and a review of previous literature, the researchers concluded that secondary DOP can coexist with any other psychiatric disorder: 17.6% (6/34)

coexisted with dementia, 5.9% (2/34) with schizophrenia, and 23.5% (8/34) with major affective disorders. Delusions of parasitosis paralleled an organic disorder in 2 patients (5.9%): one patient with methamphetamine and cannabis abuse and one patient with postinfectious chronic fatigue syndrome.⁸⁸

Parasitic delusions also can be a manifestation of any underlying psychiatric condition, such as schizophrenia, dementia, or psychotic depression.^{8,10,62,88,89} A single case report notes its association with post-traumatic stress disorder.⁶⁶ A careful psychiatric evaluation should be administered to find evidence of other disorders. An important difference between DOP and schizophrenia is the lack of prominent first rank symptoms, such as auditory hallucinations, and negative symptoms, such as flattened affect.¹⁴ Also, in contrast to schizophrenia, DOP lacks global social impairment, loosening of association, and the delusion is nonbizarre (ie, infestation is a conceivable occurrence).⁹⁰ Physicians should be careful to distinguish DOP associated with an affective disorder from DOP secondary to an affective disorder. Also confirm that the depression did not predate the delusion; if depression did predate the delusion, confirm that it is not severe. Additionally, ensure that the delusion and tactile sensations do not coincide with the course of the affective illness.⁹⁰

There are many substances that are associated with parasitic delusions. Cocaine⁹¹⁻⁹³ and methamphetamine⁹⁴ are notorious for causing tactile sensations associated with parasitic hallucinations. Methylphenidate hydrochloride use is another culprit.⁹⁵⁻⁹⁷ Alcohol use can cause formication during withdrawal.^{67,98} Indeed, many cases of DOP have been associated with a remote history of long-term alcohol abuse.^{64,68} Case reports indicate a similar problem with prescription medications such as the monoamine oxidase inhibitor phenelzine sulfate^{99,100} and corticosteroids.⁶⁹ One case described an association with pemoline, a central nervous system stimulant used for attention deficit hyperactivity disorder.¹⁰¹ Use of amantadine hydrochloride also has been cited as a cause.¹⁰²

Parasitic delusions have been reported in patients with general medical conditions, such as vitamin B₁₂ deficiency,^{10,103} pellagra,^{10,104} kidney disease,^{10,75} diabetes mellitus,^{10,68,70} hypertension,^{3,68,70} thyroid disease,⁷¹ heart failure,^{3,68} multiple sclerosis,¹⁰ hepatitis,¹⁰ syphilis,³ cerebrovascular disease,^{10,69,105} stroke,^{10,70,76,106} pneumonia,¹⁰ tuberculosis,³ lymphoma,¹⁰⁵ AIDS,⁶⁴ pituitary tumor,^{72,105} and Lyme disease.⁵

When considering a diagnosis of DOP, one must consider the differential diagnoses and conditions associated with pruritus and paresthesia, as these

sensations may be the precipitating idea from which the delusion is derived.^{62,73}

To differentiate these conditions, the following laboratory tests should be conducted: complete blood cell count, chemistry panel, thyroid stimulating hormone, rapid plasma reagin, urinalysis, and urine toxicology screen. Based on the addition of other symptomatology, measuring vitamin B₁₂/folate levels or performing a computed tomographic scan also may be indicated.⁷⁴

Comment

Delusions of parasitosis remain an interesting and challenging problem for physicians. It is a delusional disorder of a somatic subtype in which patients believe they are infested. By definition, the disease is not secondary to any underlying psychiatric or organic disorder, though the same delusional thoughts may be present in patients with these disorders. This distinction is important because the treatment modalities vary.

While most patients with DOP present first to a family or general practitioner, dermatologists or psychiatrists report most cases.¹⁰⁷ General practitioners and physicians in other fields to whom these patients commonly present will be integral to early recognition of this psychotic disorder.¹⁰⁸ We suspect that this disorder is more common than previously thought and we hope to raise the level of awareness.

This article is the first of a 2-part series. The second part on treatment options will appear in a future issue of Cutis®

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