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# Delusional Disorder: Pathogenesis, Diagnosis, and Treatment Approaches

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## 1. Abstract

Delusions are persistent, mistaken beliefs that defy external reality and are upheld despite evidence to the contrary. They are a hallmark of various mental and neurological disorders and present a significant challenge in distinguishing them from overvalued ideas. This overview explores the nature, pathogenesis, and clinical management of delusional disorders. Delusions are categorized into several subtypes, including persecutory, jealous, erotomanic, somatic, grandiose, mixed, and unspecified types, each with distinct characteristics and implications for patient behavior. The prevalence of delusional disorder is approximately 0.2%, with a higher incidence in older adults and a notable association with depression. The DSM-5-TR outlines diagnostic criteria emphasizing the persistence of delusions and their impact on functional impairment. Neurobiological and genetic factors, such as dysregulation of dopamine systems and genetic variations, contribute to the disorder's development. Risk factors include genetics, biological imbalances, stress, substance abuse, and sensory impairments. Prevention strategies focus on early detection, stress management, and social support. Clinical presentation varies, with symptoms ranging from sudden to gradual onset, and complications include depression and potential legal issues. Diagnostic processes involve excluding other causes and conducting comprehensive evaluations. Treatment primarily involves antipsychotic medications, with second-generation antipsychotics being preferred due to their favorable side effect profiles. Psychotherapy, including cognitive-behavioral therapy, can augment treatment outcomes. The prognosis depends on treatment adherence and response, with some patients experiencing symptom relief while others may face ongoing challenges.

## 2. Keywords

Delusional disorders, Delusions, Antipsychotics

## 3. Overview and pathogenesis

A delusion is a persistent mistaken belief caused by a misperception of external reality, even if evidence disproves it. This belief contradicts the standards of one's society or subculture, and almost everyone else recognises it as erroneous [1]. The defining characteristic of a delusion is the extent to which an individual is convinced that their belief is accurate. Someone with a delusion firmly maintains their

belief despite evidence that contradicts it [2]. Delusions can be challenging to differentiate from overvalued ideas, which are unreasonable beliefs that an individual holds but with some doubt about their validity. In contrast, a person with a delusion is completely certain that their belief is true. Delusions are indicative of a medical, neurological, or mental disorder [2]. Delusions can occur in various mental disorders, including a. Psychotic disorders, where individuals have a diminished or distorted sense of reality and struggle to differentiate between what is real and unreal, such as schizophrenia, schizoaffective disorder, delusional disorder,

schizophreniform disorder, shared psychotic disorder, brief psychotic disorder, and substance-induced psychotic disorder; b. Bipolar disorder; c. Major depressive disorder with psychotic features; d. Delirium; and e. Dementia [3].

According to the American Psychiatric Association's Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition, Text Revision (DSM-5-TR), delusional disorder is defined by the occurrence of one or more delusions lasting for at least a month. Aside from these delusions and their effects on behavior, the individual generally does not exhibit unusual behavior or significant functional impairment [4]. The DSM-5 classifies delusional disorder into seven subtypes based on the theme of the delusion:

**Persecutory type:** The main focus is on the belief that one is being targeted, conspired against, attacked, or hindered in achieving long-term goals. This is among the most frequently encountered types of delusions. Individuals with this type may exhibit anxiety, irritability, aggression, or even violent behavior, and some may engage in legal disputes.

**Jealous type:** The belief that one's sexual partner is being unfaithful. Also referred to as "Othello syndrome," this type is more frequently seen in men and can sometimes be associated with suicidal or homicidal thoughts, making safety a crucial aspect of evaluation and management [5].

**Erotomaniac type:** Also called "psychose passionelle," this delusion centers on the belief that someone of higher social status is in love with the patient [6]. Individuals with this type are often socially withdrawn, dependent, sexually inhibited, and have poor social and/or occupational functioning [7]. A key feature is "paradoxical conduct," where any denial of affection is interpreted as a sign of love. Men with this delusion may exhibit more aggressive behavior [8].

**Somatic type:** This type of delusion focuses on bodily functions and sensations. Also known as monosymptomatic hypochondriacal psychosis, it involves severe impairment of reality perception. The patient is firmly convinced of the seriousness of their symptoms. Common examples include delusions of being infested with parasites, body dysmorphic disorder, and concerns about body odor or bad breath. Patients with somatic delusions often experience anxiety and nervousness.

**Grandiose type:** Also referred to as megalomania, this delusion is characterized by an exaggerated sense of self-importance. Individuals may believe they possess extraordinary talent, have made significant discoveries, or have inflated self-worth, power, knowledge, or a special connection with a famous person or deity.

**Mixed type:** Patients exhibit two or more delusional themes, with no single theme being predominant.

**Unspecified type:** In some cases, a dominant delusion cannot be pinpointed. For instance, Capgras syndrome involves the belief that a familiar person has been replaced by an imposter. Cotard syndrome is characterized by the belief that one has lost their possessions, status, or even bodily organs [9].

The prevalence of delusional disorder in the population is estimated to be around 0.2%, with an incidence ranging from

0.7 to 3.0 cases per 100,000 individuals [10]. Delusional disorder often manifests later in life. The DSM-5 notes that while there are no significant gender differences in the overall prevalence of delusional disorder, it is observed more frequently in elderly women than men. Depression is the most common comorbidity linked to this disorder [11], and treatment response is generally seen as poor. Factors such as the age of onset and delays in treatment are thought to affect the outcome.

The relationship between delusional disorder and more severe psychotic disorders is still not fully understood. According to the DSM-5-TR, individuals with delusional disorder tend to function better overall compared to those with schizophrenia. Although delusional disorder often remains stable over time, there is a possibility that some patients may eventually develop schizophrenia. Notably, there is a significant familial link between delusional disorder, schizophrenia, and schizotypal personality disorder. Despite the fact that delusional disorder can manifest in younger individuals, it is predominantly diagnosed in older adults [12].

Biological factors are thought to contribute significantly to the development of delusional disorder. Delusions associated with delusional disorder are also frequently observed in various nonpsychiatric medical conditions. For example, in patients with neurological disorders, delusions are often linked to lesions in specific brain regions such as the basal ganglia and temporal lobe [13,14]. A case study involving somatic delusions, particularly those concerning body part duplication, demonstrated hypoperfusion in both the temporal and parietal lobes, highlighting a potential neurological basis for these delusions [15].

Research conducted by Campana, et al. [16] explored the connection between frontal lobe functions and delusional disorder symptoms using eye-tracking technology. Their study revealed that patients with delusional disorder exhibited abnormalities in voluntary saccadic and smooth pursuit eye movements, which are also seen in schizophrenia when compared to healthy controls. This finding suggests that similar neurophysiological mechanisms might be at play in both conditions.

The precise mechanisms underlying delusional disorder are not yet fully understood, but initial evidence points to genetic variations in dopamine receptor genes, such as DRD3 and DRD4, as potentially linked to the disorder. Most patients with delusional disorder experience their delusions as "ego-syntonic," meaning these beliefs are consistent with their sense of reality and self-concept [17].

One prominent hypothesis is that reduced functioning of striatal dopamine transporters could be responsible for both primary and secondary cases of delusional parasitosis. This

hypothesis is supported by evidence suggesting a genetic predisposition to hyperdopaminergia related to D2 receptors and dopamine neurotransmitter dysfunction. This implies that delusional disorder might be more closely associated with D2 receptors compared to other psychotic conditions. Another hypothesis similarly suggests that decreased striatal dopamine transporter functioning may contribute to delusional parasitosis.

Hyperdopaminergic states are considered a key factor in the

development of delusions. Recent research by Morimoto et al. found that patients with delusional disorder had elevated plasma levels of homovanillic acid (HVA), a metabolite of dopamine, compared to controls. These patients showed clinical improvement with low-dose haloperidol treatment (average 2.7 mg/day), which led to reduced HVA levels and correlated with symptom relief [17].

In addition, Morimoto, et al. [17] identified a higher prevalence of a specific polymorphism in the D2 receptor gene (amino acid 311, cysteine-for-serine substitution) among individuals with delusional disorder, especially those with persecutory delusions. They also found that individuals with more TCAT repeats in the first intron of the tyrosine hydroxylase gene had higher HVA levels. However, it remains unclear if the study adjusted for multiple statistical comparisons, which is crucial for validating these findings.

#### 4. Risk Factors and Prevention

Although there are no clear causes that lead to delusions yet it is believed that genetics, biological factors and certain environmental factors are involved in the development of delusional disorders.

As other psychological disorders, delusion disorders were seen running in families such as HLA-A\*03 gene which is common for both delusional disorders and paranoid schizophrenia. Additional studies have shown that polymorphism of the DRD2, DRD3 and/or TH gene is part of the genetic basis of the paranoid symptoms in delusional disorder [18,19].

From the biological aspect, neurotransmitter imbalances such as dopamine disturbances in the limbic system and basal ganglia can lead to delusional disorders [18].

Stress, alcohol use disorders, substance use disorders can also be triggers for delusion disorders.

Evidence suggests that hypersensitivity, social isolation, low self esteem, and certain types of ego defenses as: reaction formation, projection and denial can be presented as psychological theories explaining the delusional disorder.

Sensory impaired persons especially in hearing or visually are considered more vulnerable type of populations for delusional disorders.

Other risk factors include: the age onset as 40 year old with a range from 18 to 90 years of age, head trauma, and immigrants with language barriers.

And finally concerning the gender risk factor, the women to men ratio in delusional disorders is

1.18 -3: 1 where women tend to present paranoid delusions whereas men present the erotomania type.

#### 4.1. Prevention

Although there is no known way to directly prevent delusional disorder, there are certain factors that help decrease the risk of getting a delusional disorder and decrease the huge disruption of a delusion disorder in a patient's life.

- Early detection and checkup regularly can help in decreasing the severity of the symptoms.
- Stress management: meditation, deep breathing

exercises, progressive muscle relaxation and regular exercising help in preventing delusional disorder.

- Avoid substance abuse and alcohol.
- Avoid Trauma

Stay social and limit isolation by joining groups and clubs and staying near family members which improves your overall mental health.

#### 4.2. Clinical presentation

Understanding the clinical presentation of delusional disorder involves examining the diverse ways in which the condition manifests in affected individuals. The clinical course of the disease varies among individuals, with approximately one-third of those affected experiencing remission, while the remaining two-thirds endure a prolonged course of the disorder. It most frequently begins between the ages of 35 and 45, though cases have been reported as early as 18 and as late as 80 years old [20]. The disorder can present with an abrupt or sudden onset, although it can also develop more gradually in rare cases. An acute onset is often linked to the presence of a precipitating event. Generally, Patients have limited insight and poor judgment concerning their delusions. It is often family members, coworkers, and non-psychiatrist physicians who first recognize the possibility of a delusional disorder and may prompt the patient to seek psychiatric evaluation.

Upon their presentation to the clinic the patients appear well-groomed and neatly dressed, showing no signs of significant impairment [21]. Their speech, psychomotor activity, and eye contact might reveal their emotional state related to their delusions, but otherwise, they are normal. The clinical mental status examination shows that the patient is oriented, alert, and attentive to its surroundings while insight and judgment related to the delusion are typically impaired. For instance, their mood and affect align with the nature of their delusions, and patients with persecutory delusions display suspicion and anxiety. Although tactile and olfactory hallucinations might be present, they should align with the delusional theme to rule in the disease. On the other hand, auditory and visual hallucinations are not characteristic of delusional disorder.

It's crucial to exclude other possible causes, such as substance use or withdrawal and temporal lobe epilepsy.

#### 4.3. Complications

If delusional disorder remains untreated, it can result in significant secondary issues, including depression, which often arises from the difficulties related to the delusions. The disorder may also precipitate violent actions or legal troubles; for example, behaviors such as stalking or harassing individuals associated with the delusion may lead to legal consequences. Furthermore, patients may experience social estrangement, particularly if their delusions disrupt their social interactions and relationships. A small study on several individuals with different types of delusions showed that the rate of suicidal ideation and behavior in patients with delusional disorder may be higher than those observed in individuals without psychiatric disorders and comparable to those seen in patients with schizophrenia [20]. Those with persecutory and somatic delusions have been reported to have a greater likelihood of experiencing suicidal thoughts compared to individuals with other types of delusions.

#### 4.4. Diagnosis

While there are no specific laboratory tests mandated for

diagnosing delusional disorder, as is common with many psychiatric conditions, imaging or lab tests may be necessary to exclude organic causes. A urine drug screen should be conducted to rule out substance-induced conditions. Once organic causes are excluded, a thorough clinical evaluation is essential. This involves assessing the patient and probing further into their delusions. A comprehensive mental status examination should be performed, and interviewing family members and friends can be valuable, as they may offer additional insights into the delusions and provide a detailed timeline of the symptoms.

The DSM-5 criteria for diagnosing delusional disorder are delineated as follows:

- A. The individual must exhibit one or more delusions that persist for a minimum duration of one month. These delusions must be of a nature that is inconsistent with the individual's cultural or societal context and cannot be classified under a different mental disorder.
- B. The criteria for schizophrenia, specifically Criterion A, have never been fulfilled. This ensures that the delusional disorder is not a manifestation of a broader psychotic spectrum disorder. Note: In instances where hallucinations are present, they must be secondary to the delusion and not a prominent feature of the presentation. These hallucinations should align with the delusional theme, such as tactile hallucinations of insect infestation correlating with delusions of being infested.
- C. Apart from the effects directly attributable to the delusion(s) or its consequences, the individual's overall functioning should remain relatively intact. The individual's behavior must not be notably bizarre or deviant from normative social and cultural expectations.
- D. Should the individual experience manic or major depressive episodes, these episodes must be brief and transient compared to the duration and persistence of the delusional episodes. The temporal relationship should demonstrate that the delusional disorder is the primary condition rather than a secondary effect of mood disturbances.
- E. The clinical presentation must not be attributable to the physiological impact of a substance (including medications or illicit drugs) or another medical condition. Additionally, the disturbance should not be more appropriately explained by another mental health disorder, such as body dysmorphic disorder, obsessive-compulsive disorder, or any other condition with a similar symptom profile, ensuring that the diagnosis of delusional disorder is not a misclassification.

## 5. Therapy and prognosis

The most important aspect of any therapy targeted to the treatment of delusional disorders is the adherence of the patient to his treatment regimen. Considering the myths associated with such disorders. The patient might refuse treatment either due to social factors or because he refuses to admit that he has a problem. Therefore, physicians should empathize with the patient and should clarify the goals of the therapy which are to minimize the adverse social effects associated with delusions rather than eliminate the delusions by itself. Occasionally, delusional disorders might manifest with other psychiatric symptoms like depression and anxiety. These patients would be more open to receiving treatment for these psychological disorders rather than their delusion and as such, when a physician finds that his patient has such a diagnosis, he can address the delusional disorders after

addressing and managing the co-occurring psychiatric disorders [22]. In delusional disorders, the preferred method of treatment is via the usage of antipsychotic medication. However, psychotherapy can be added to such treatment to enhance the effect of such medicines and to reach and maintain the desired outcome of the therapy. Patients may stop such drugs because of their side effects, so it is necessary to encourage the patient to adhere to the therapy. If a patient is having difficulties sticking to his therapeutic regimen, a long-acting formulation of an injectable antipsychotic can be used to replace oral medications [23]. However, an order for a metabolic panel with an electrocardiogram is needed before the initiation of antipsychotic treatment, whether it is with first or second-generation antipsychotics. If the patient has a prolonged QT interval, all medications that increase QT interval must be avoided as it can cause torsade de pointes.

Second generation antipsychotics are a more favorable choice of treatment because of the reduced extrapyramidal side effects. A dose of 2 to 5 mg/day of aripiprazole can be initiated and slowly increased to 10 to 20 mg/day over several days or weeks. A therapeutic dose can be found by monitoring the clinical response of the medication at a certain dose. When the delusions are resistant to treatment, Clozapine, another 2nd generation antipsychotic drug can be used especially if the patient has a high suicide risk [24,25]. A study done on 455 patients with a delusional disorder that is prescribed Olanzapine and risperidone showed more than 80% adherence to the therapy and more than 52% had improvement in their symptoms [26]. Generally speaking, studies done on first-generation antipsychotics had better improvement of symptoms in patients with delusional disorders, but such drugs are not favored due to the long-term toxicities associated with such drugs [27]. When a certain antipsychotic medication improves the patient's symptoms with minimal side effects. Such medications should be continued for a long period depending on the type of delusion facing the patient and whether severe side effects start to develop. If the patient does not improve on a certain second-generation antipsychotic drug, another drug of the same family can be started with the patient monitored for clinical improvement for four weeks.

Delusional Infestation which is also known as delusional parasitosis needs a similar approach to successfully manage the symptoms of this disease. The physician needs to empathize with the patient and should never deny the patient's delusional symptoms as unreal [28]. Some authors generally advise the usage of a non-confrontational approach while dealing with patients with delusional infestation [29]. It is recommended that the physician educate the patient on the importance of receiving therapy for their disorder as patients would be hesitant to receive antipsychotic therapy. Second-generation antipsychotics are more favorable in the treatment of such disorders for the same reasons mentioned above. Among the secondary available antipsychotics, Risperidone is generally more favorable due to the numerous studies done on this drug [30,31]. As previously mentioned, antipsychotics are generally started at a low dose which is then increased slowly until a therapeutic point is reached where the patient's symptoms are managed with minimal side effects caused by the therapy. Risperidone for example is started at a dose of 0.5 mg/day and increases over weeks until a clinical response is reached [32,33]. Another antipsychotic can be used such as Olanzapine which is started at a dose of 2.5 mg/day and increased by a value of 2.5 mg every week [34,35].

Olanzapine is one drug among many other antipsychotics that increase the risk of insulin resistance [36]. So, patients taking such drugs need to be monitored for any metabolic effect caused by these drugs. There are 2 outcomes for therapy. Either the patient responds to the treatment given or he does not respond for the specific treatment given. In case of a positive response to treatment, the patient generally should continue with his therapeutic dose for many months up to a year [37]. When there is a decision to stop therapy, the therapeutic dose should be slowly decreased over weeks. Moreover, if the patient does not respond well to the initial therapy given, another drug should be prescribed according to his specific need.

Psychotherapy can also be added to antipsychotic therapy in the management of delusional disorders. Few studies were done on the effect of cognitive behavioral therapy (CBT) in the treatment of delusional disorders. Such studies showed a positive impact of CBT on delusional thinking with improvement in symptoms [38,39].

Supportive psychotherapy can also be added to the treatments above. Such treatment aims at reducing patient discomfort through empathy and specific suggestions.

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