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Dangerous Intersection of Alcoholism and Othello Syndrome: A Comprehensive Review of Delusional Jealousy and Treatment Strategies

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The modern pace of life, increased susceptibility to stressors, and easy access to psychoactive substances have contributed to the increase in the number of people addicted to alcohol. Alcoholism has serious and life-threatening consequences, one of which is brain damage causing morbid jealousy, otherwise known as Othello syndrome. The disease, currently classified as a subtype of delusional disorder, manifests itself in groundless and dangerous judgments about a partner's sexual infidelity. People with Othello syndrome constantly believe in their partner's infidelity despite inadequate evidence of it. Patients become aggressive toward their partners as well as themselves, which is why in a fit of anger they can commit murder or suicide. Othello syndrome can occur as a symptom of an underlying mental illness, but it is most often associated with brain damage caused by chronic alcohol use. Antipsychotic drugs and serotonin reuptake inhibitors are used in pharmacotherapy. Targeted treatment using the neuropeptide oxytocin, which modulates the transmitter systems responsible for disease symptoms, is also being considered. The use of oxytocin seems groundbreaking, but it remains at the research stage. The treatment of addictions and primary diseases, as well as long-term cognitive-analytic psychotherapy, also have a huge impact. Othello syndrome is a life-threatening disease with an insidious course and serious consequences. This article aims to review the manifestations of morbid jealousy, including delusional disorder, and the association with alcoholism.

Keywords: **Alcoholism • Delusions • Jealousy • Oxytocin**

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Introduction

Lifestyle trends and increased access to alcohol contribute to an increase in the number of hospitalizations and treatment of patients with addiction. An accelerated pace of life, stressful work or lack thereof, and poor social support are some of the risk factors of the development of alcoholism [1].

In the advanced stage of the disease, many somatic and mental symptoms occur, which include, among others, visual and auditory hallucinations and personality changes [2]. A noteworthy phenomenon is the occurrence of delusional psychosis in the form of delusions about marital infidelity, which is known as Othello syndrome, a psychotic disorder that occurs in the form of delusions of the partner's infidelity despite the lack of adequate evidence of infidelity [3]. People with this disease pose a direct threat to the life of their partner and their loved ones as a result of increasing morbid jealousy, a severe form of pathological jealousy characterized by overall absorption in thoughts about the partner's sexual infidelity. The accompanying psychopathological symptoms, such as delusions, obsessions, or overvalued ideas on the same subject, constitute the most severe form of the disease, delusional jealousy [4,5].

The Diagnostic and Statistical Manual of Mental Disorders, fifth edition (DSM-V) classifies delusional jealousy as a subtype of delusional disorder (F22) [6]. Due to the psychotic nature of the symptoms, antipsychotic drugs and psychotherapy are used in treatment [7].

In this article, we aim to increase the awareness of addiction treatment specialists and general practitioners about the danger of these symptoms in people chronically abusing alcohol. Therefore, this article aims to review the manifestations of morbid jealousy, including delusional disorder, and the association with alcoholism.

Epidemiology

The motif of morbid jealousy appears in many literary works. It can be found, among others, in Shakespeare's play *The Winter's Tale* (1610) and in ancient Greek myths. Othello, the main character of Shakespeare's play, constantly believes in the infidelity of his wife Desdemona. Consumed with jealousy, he murders her and then commits suicide. Othello's actions are attributed to the delusion of jealousy, giving this infamous condition its name, Othello syndrome. Unfortunately, this pathology is not just a literary invention but a real and life-threatening disease. Othello syndrome is described in numerous texts as rare; unfortunately, it is becoming more common due to the growing number of alcohol addictions. The exact frequency of Othello syndrome is not known because of

the lack of a uniform scientific definition of the disease and because no social studies have been conducted [8].

This syndrome is characteristic not only in individuals with alcohol dependency, but also in patients with Parkinson disease or other psychiatric diseases. Othello syndrome was diagnosed in 0.5% to 1.4% of patients hospitalized for psychiatric disorders and in up to 15.8% of patients with neurocognitive disorders [9]. One study showed that women with symptoms of morbid jealousy were more often diagnosed with schizophrenia, while men had symptoms of alcohol addiction [10]. The estimated incidence of Othello syndrome among patients with Parkinson disease was 5.2% in 116 patients in this study group [7,11]. Research results on the epidemiology of Othello syndrome are often contradictory. One of the analyses conducted showed a frequency of delusions in approximately 35% of men and 31% of women who abused alcohol, and another study contradicted that result, reporting the presence of symptoms in 7.59% of respondents, regardless of the underlying disease responsible for psychotic symptoms [8,12].

Etiology and Presumed Pathomechanism

Jealousy is a complex emotional state that commonly occurs in every person. When there is complete groundlessness associated with the jealousy, it becomes a pathological symptom, which can be caused by a serious mental illness or by the organic brain damage resulting from alcoholism [13].

The exact etiology of Othello syndrome is not fully known. The influence of many factors belonging to the following groups is suspected: psychological, environmental, organic, and personal. Since the 19th century, this disease has been associated with chronic alcohol abuse, which causes organic changes in the brain that affect behavior [14].

More than 70% of people with chronic alcohol use disorder show some degree of brain damage, which includes decreased brain volume in several critical regions, such as the frontal, temporal, parietal, cingulate, and insular cortices, cerebellum, thalamus, and hippocampus. Therefore, with age, such people experience significant deterioration of cognitive functions [15].

Reports from the medical literature emphasize the influence of past experiences on the development of the disease, namely, the experience of betrayal, sexual jealousy, or disinhibition of a previously present trait of jealousy. The growing tension caused by the discrepancy between the sexual needs of the patient and his partner or the inability to have intercourse, for example, due to organic erectile dysfunction, does not remain unaffected. People may even believe that they are deliberately given a substance that reduces libido [16,17].

Information from the literature indicates that in approximately 30% of cases of delusional jealousy, there is a neurological basis, and its elements combine with psychodynamic factors, creating specific delusions. In other words, delusions begin to develop when unexpected sensory events are detected but are assessed incorrectly.

Dopamine neurons present in the brain respond to these unexpected stimuli, and the detected abnormal signals are transmitted to the striatum, limbic system, and frontal cortex. The right lateral prefrontal cortex is the center of these projections, and impairment of the circuits involving this center leads to the occurrence of delusions [18].

Moreover, patients with Othello syndrome showed a greater loss of gray matter, mainly in the dorsolateral frontal lobe. Case reports indicate that structural changes in the frontal lobes, including orbitofrontal changes and changes in the right hemisphere, are of key importance in the genesis of content-specific delusions, due to the role of the right hemisphere in generating the experience of similarity and the role of the frontal lobes in correcting erroneous ideas based on new information [14].

Moreover, a recent lesion network mapping study suggests that the pathobiology underlying post-stroke delusions is not the location of the lesion itself, but rather disruption of the functional connectivity of the network encompassing the right frontal cortex. Researchers describe cases of Othello syndrome in patients after left frontal or right thalamic stroke, among others [19].

One of the eminent forensic psychologists, Professor Paul Mullen, associated morbid jealousy with the following features: the presence of an underlying mental disorder appears before or together with the jealousy, the underlying condition and its symptoms coexist with the jealousy, and there is a lack of reliable evidence constituting the basis of the jealousy [1,10]. Therefore, it is believed that the symptoms of Othello syndrome are caused not only by changes in the central nervous system, but also by an accompanying organic disease or damage to the brain resulting from addiction to psychoactive substances, such as amphetamine [5]. It is also interesting that some men with Parkinson disease developed delusions as a result of dopamine therapy [17].

Symptoms

In patients, the degree of jealousy and/or beliefs about the partner's infidelity reach delusional intensity. Having no evidence of betrayal or even a signal of the possibility of losing their partner as a result of him leaving for his lover, these people are unable to stop the crucial psychological phenomenon in their jealousy, namely, intrusion thoughts of betrayal that cannot be controlled [20]. There are constant conflicts

between partners caused by tormenting questions about sexual fidelity, demands for explanations, following the partner, or inspection of underwear for stains of body fluids. Patients can gather evidence based on random events, snippets of conversations, or accidentally found things in the yard to support their suspicions. Moreover, they refuse to change their beliefs even in the face of information that excludes betrayal. Delusions are often absurd, with suspicions falling even on people of advanced age and people from the closest family, or they may point to a very large number of alleged lovers [17].

The danger posed by people with Othello syndrome ranges from serious verbal threats to acts of murder. The growing emotional tension among patients can manifest itself in violence against sexual partners and family members [10].

One study showed that 15% of men and women had been subjected to physical violence by a jealous partner in the past [21]. The partner's checking and controlling behavior can be part of the psychosis but can also dominate its clinical presentation. These people also pose a threat to themselves, because as a result of remorse related to harassing their partner, depression, or the use of psychoactive substances, suicide attempts can occur [14,22]. Additionally, the paranoid personality predisposes to the development of Othello syndrome because it is characterized by inflated ideas about infidelity [10].

Diagnosis

Clinical diagnosis of Othello syndrome is a difficult task. The current diagnostic classification included in the DSM-V from 2013 classifies delusional jealousy as a subtype of delusional disorder (F22) [6]. The classification seems imprecise and can vary depending on the intensity of the belief, the presumed cause, and whether jealousy is perceived as a symptom or a syndrome. Therefore, patients with the presence of jealousy disorder but no experiential delusions are excluded from the diagnosis. Consequently, the diagnostic criteria are considered non-inclusive. Most people with jealousy disorder were excluded from diagnosis and did not receive appropriate psychiatric care and treatment [14,23].

The diagnostic criteria according to the DSM-V include the following: presence of delusions about the partner's fidelity in the absence of reliable evidence, lasting at least 1 month; exclusion of criterion A for schizophrenia; slight impairment in general functioning; duration of possible accompanying manic or depressive episodes was shorter than the duration of the delusional period; the disorder cannot be attributed to the physiological effects of a substance or other medical condition and is not better explained by another psychiatric disorder, such as body dysmorphic disorder or obsessive-compulsive disorder [6].

Unlike the American Psychiatric Association, the World Health Organization attributes this disease to alcohol use disorders. In the ICD-10, it is listed under the code F10.5 [24].

The diagnostic tools used include a clinical interview assessing the presence of delusional symptoms and the presence of comorbidities, as well as psychological tests enabling the assessment of the patient's general cognitive functions, emotional condition, and personality.

Treatment

Basically, the treatment of Othello syndrome is similar to the treatment of psychoses [7]. Apart from the main pharmacotherapy used, a huge role is played by psychological therapy, among which behavioral, cognitive therapy, and individual and couples therapy are recommended. The use of cognitive-analytic therapy is also promising [25].

Treating addiction or another mental illness that may be the underlying cause is also important. Pharmacotherapy uses drugs that affect the two most responsible transmitter systems that create delusions – the dopaminergic and serotonergic systems. Delusions of jealousy and the accompanying psychotic symptoms are treated with antipsychotic drugs that target the dopaminergic system. The treatments used include, for example, clozapine and quetiapine. On the other hand, due to the similarity of the disease to obsessive-compulsive disorders and its depressive elements, serotonin reuptake inhibitors are used, such as fluoxetine, at a dose of 20 mg/day [7,21]. A case has been described of a patient whose delusions recurred after discontinuing treatment [26].

In patients with Parkinsonism and symptoms of Othello syndrome, antiparkinson medications should be discontinued or reduced. The best treatment option for them is to discontinue dopamine agonists or replace them with equivalent doses of levodopa. Moreover, if necessary, clozapine should be additionally administered [27,28].

A modern drug that may be associated with the treatment of morbid jealousy is the neuropeptide oxytocin. It has been shown that it can also modulate the above systems, and its concentration is different in other psychotic states, such as schizophrenia or obsessive-compulsive disorder. Studies conducted on a healthy population have shown that intranasal administration of oxytocin affects the brain, strengthening romantic bonds between partners, and reducing the feeling of jealousy caused by real or false presumptions [9]. This is a positive aspect of its use in targeted therapy. However, no study has been conducted to confirm its potential therapeutic effect in the treatment of pathological jealousy; therefore, there is still a

need for much research focused on dosage strategy and possible interactions with other peptides or effects on other system relays [21,29]. It is important to emphasize that its intranasal use is safe and is not associated with any undesirable side effects. Moreover, oxytocin has been shown to have a beneficial effect on reducing positive symptoms in schizophrenia [21].

Prevention also involves separating partners and informing the appropriate social welfare services, whose task is to intervene and provide help to those harmed by the patients [30].

Future Directions

Appropriate questionnaires that would be used by doctors to diagnose delusional jealousy as a subtype of delusional disorder would enable earlier help for patients who consulted a specialist with disturbing symptoms. The development of screening tests would also contribute to the possibility of self-diagnosis for patients who noticed disturbing symptoms related to jealousy. They could be conducted by partners of patients who, when detecting the risk of disease, would contact medical staff to obtain help. Deepening knowledge and research on the etiology and risk factors predisposing to the development of Othello syndrome would enable the development of new methods of treating the disease. Ongoing work on the use of oxytocin in the treatment of Othello syndrome should be followed. If its effectiveness is confirmed, oxytocin would provide quick and effective help for patients with symptoms of morbid jealousy.

Conclusions

Othello syndrome is a serious and life-threatening disease with long-term consequences for many people. It is mainly associated with a complication caused by long-term alcohol abuse, but it also occurs in schizophrenia and Parkinson disease. The pathomechanism of its development is not fully known, but it is known what systems are involved in the development of symptoms. Thanks to this knowledge, it is possible to use pharmacotherapy to alleviate the symptoms of the disease and induce remission. For the treatment to be effective, long-term cooperation between the patient, doctor, and psychotherapist is required. We should not forget about the diagnosis and treatment of the underlying disease, for which delusions of jealousy can appear as a mask or as its main symptom. The use of oxytocin seems to be a promising treatment, which, if the research results are confirmed, could be a breakthrough in the treatment of delusions of jealousy. Moreover, increasing the awareness of medical staff about the danger posed by the symptoms of pathological jealousy can speed up the diagnostic and treatment process of patients and thus reduce the risk of life-threatening consequences.

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