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Othello Syndrome in Parkinson's Disease - a review of etiology, diagnosis and management

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Abstract

Introduction: Othello syndrome, also known as delusional jealousy, is a rare subtype of delusional disorder characterized by a persistent, unfounded belief in a partner's infidelity. Although classically associated with psychiatric disorders, OS is increasingly recognized in the context of neurological diseases, particularly Parkinson's disease. This review explores the epidemiology, pathogenesis, symptomatology, and treatment of OS, with emphasis on its manifestation in PD patients.

Materials and Methods: This narrative review examines recent research on OS, focusing on its presentation in PD and current treatment approaches. Sources include studies from 2021-2024 identified via PubMed database, along with DSM-5 and ICD-10 guidelines.

Results: The prevalence of OS ranges from 0.5-1.4% in psychiatric populations and up to 15.8% in individuals with major neurocognitive disorders, including PD. In PD, delusional jealousy is the second most common type of delusion after persecutory delusions and is most commonly linked to dopamine agonist therapy rather than PD dementia. Neuroimaging studies suggest dysfunction in the frontal-limbic circuitry, especially in the right prefrontal cortex, contributes to the development of OS. Symptoms include fixed delusions of infidelity, compulsive behaviours, emotional dysregulation, and occasionally, visual hallucinations. These often result in interpersonal conflict, aggression, and increased risk of suicide and homicide.

Conclusions: Management of OS in PD is complex and often requires modification of dopaminergic treatment. Reducing or discontinuing dopamine agonists may alleviate symptoms but can exacerbate motor dysfunction. Atypical antipsychotics, mood stabilizers, and SSRIs have shown benefit. Recognition of OS is crucial, as its impact on patient quality of life and interpersonal relationships can be profound. Early diagnosis and individualized treatment are essential to prevent escalation to violence or psychiatric crises.

Key words: Othello syndrome, Parkinson's disease, delusional jealousy, dopamine agonist therapy

Introduction

"Othello" is a famous tragedy by William Shakespeare, portraying a husband obsessed with his wife's presumed infidelity, ultimately leading him to mariticide and suicide. Just as the name suggests, Othello syndrome (OS) is a quite rare, although interesting and clinically significant, condition, characterized by a delusional conviction of partner's extramarital affairs. And like in the play, it can result in unprovoked conflict in the relationship and even violence.

Othello syndrome belongs in the classification of Delusional Disorders (297.1) according to Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5), specifically the "jealous type". The central theme of such delusions is the belief in a partner's unfaithfulness, which isn't supported by strong evidence, but by patient's own strong conviction. The diagnostic criteria are based on DSM-5 and exclusion of other disorders [1].

The cause of the condition itself is unknown. Research suggests delusional thinking arises from dopaminergic hyperactivity and genetic causes, but it differs from schizophrenia in associated genes and homovanillic acid (HVA) levels, depending on the type of delusions [2]. Delusional

jealousy (DJ) may also present in other diseases, such as alcohol use disorder or bipolar disorder, which could make it more difficult to diagnose the syndrome as a separate condition [3]. Othello syndrome is also associated with neurological diseases, such a Parkinson's disease.

In this paper, we will closely examine the relationship between these two and available treatment methods.

Epidemiology

Othello Syndrome is estimated to occur in 0.5% to 1.4% of psychiatrically hospitalized patients and even up to 15.8% in patients with major neurocognitive disorders, such as stroke, brain trauma, brain tumours, encephalitis, multiple sclerosis and others [4]. One of the neurocognitive disorders associated with Othello syndrome is Parkinson's disease (PD) which is a degenerative disease characterized by Lewy body pathology, that can spread throughout the central nervous system, causing both motor and non-motor symptoms. The latter include behavioural changes and neuropsychiatric problems, such as sleep disturbances, sudden mood changes and psychosis. Delusional thinking within the psychosis in patients with PD estimates from 3 to 10%.

OS appears to be the second most common type of delusion in PD, following persecutory delusions and research suggests, it is mostly in relation to dopamine agonists and younger age and not PD dementia. [4]

Pathogenesis

Unfortunately, the exact cause of Othello syndrome is not yet fully known, but scientists suspect it to be multifactorial and involving the effects of dopaminergic treatment, frontal-limbic circuit dysfunction and neurodegenerative process acting in conjunction with individual vulnerability factors.

It is believed that a key factor to the development of Othello Syndrome in patients with Parkinson's disease is dopaminergic agonists therapy [5] which may lead to dopaminergic dysregulation, associated with the emergence of impulse control disorders and delusional syndromes, including Othello syndrome. Those disorders are based on overly stimulated mesolimbic pathways particularly the nucleus accumbens and ventral striatum, which are involved in reward processing and emotional salience attribution and lead to compulsive behaviours. [6]

Some neuroimaging and neuropathological studies support the theory that pathological jealousy in patients with Parkinson's disease is associated with disrupted fronto-limbic connectivity, as

well as abnormalities in the orbitofrontal cortex, anterior cingulate cortex and dorsolateral prefrontal cortex. [7] It is believed that dysfunction of the right prefrontal cortex, in particular, is responsible for the occurrence of Othello syndrome, as this region is involved in belief evaluation, impulse inhibition, and affect regulation. [8]

Furthermore, neurodegeneration associated with Parkinson's disease also contributes to a heightened vulnerability to psychosis and delusions, as studies show greater grey matter loss in the dorsolateral frontal lobes in neurodegenerative patients with Othello syndrome compared to those without it. [9]

Importantly, Othello Syndrome does not occur in isolation from patient's psychiatric history or psychosocial context. Some psychiatric diseases for example depression or anxiety and existing personality traits may act as risk factors for delusional jealousy. [10]

Diagnosis

Othello Syndrome is not classified separately in the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5), but is typically diagnosed under the category of Delusional Disorder, Jealous Type.

It is defined by the presence of one or more delusions lasting for at least one month. In the jealous subtype, the dominant delusional theme involves the belies that one's spouse or partner is unfaithful, often without any real proof and frequently in the face of contradictory evidence. The diagnostic criteria for Delusional Disorder include:

1. One or more delusions with a duration of at least one month
2. Criteria A for schizophrenia has never been met
3. Apart from the delusions, functioning is not markedly impaired, and behaviour is not overly bizarre
4. Any mood episodes that have occurred are brief relative to the duration of the delusional period
5. The disturbance is not due to the physiological effects of a substance or another medical condition, and it is not better explained by another mental disorder [1]

Moreover, clinical assessment should include a detailed psychiatric history, neurological diagnostic tests [11] and anamnesis with an emphasis on alcohol and substance abuse. [12]

DSM-V gives a useful diagnostic framework for identifying Othello Syndrome, however due

to the complexity of the syndrome accurate diagnosis requires careful differentiation from other psychiatric and organic conditions.

In contrast to the American Psychiatric Association and DSM-5, the World Health Organization classifies this condition as a consequence of alcohol use disorder, and it is identified in the ICD-10 under the code F10.5. [13]

Symptoms of the disease

Some patients with Parkinson's disease may experience psychotic symptoms such as delusions and hallucinations. It is estimated that approximately 1 in 100 individuals with the condition are affected by these symptoms [14]. One of the manifestations of these psychotic disorders is Othello syndrome. It is the second most common type of delusion in patients with Parkinson's disease, after persecution mania [4].

Interestingly, although Othello syndrome occurs more often in the course of neurological diseases, it has also been observed in psychiatric patients suffering from depression, anxiety disorders, bipolar disorder, and schizoaffective disorder [9].

The main symptoms of this disorder include delusions consisting of morbid jealousy of the other person and conviction of their infidelity. They are caused by overinterpretation of coincidences, erroneous perception of the partner's behaviour or conversations. The patient maintains these beliefs despite clear evidence to the contrary or rational explanations [4].

These delusions often lead to aggressive behaviour - the rate of violence against the partner in these patients can reach up to 60% [15]. In Othello syndrome, visual hallucinations also occur, but they are much rarer than typical delusions. Patients then believe that they see their spouse committing an act of betrayal [9].

These psychotic symptoms cause patients to live in constant fear and stress, which is often more burdensome than the motor symptoms characteristic of Parkinson's disease [14]. An important aspect is also the increased risk of suicide and homicide, which is why clinicians should be especially vigilant in the therapeutic process of patients with Othello syndrome [16].

The consequences of this disease are the destruction of family relationships, divorces and a significant deterioration in the quality of life of the patient and those closest to him. Therefore, it is particularly important to detect the first symptoms and quickly report to a doctor, preferably a psychiatrist.

Treatment of Othello Syndrome

Before describing the methods for treating Othello syndrome, it is important to note that patients affected by this condition often have multiple comorbidities and are frequently treated with numerous medications. In individuals with coexisting Parkinson's disease, one must also consider the complexity of its pharmacological management.

Parkinson's disease is caused by the degeneration of dopaminergic neurons, in its treatment we use several groups of drugs, but this is mainly symptomatic treatment due to the complicated mechanism of the disease. Common medications include levodopa, dopaminergic agonists, anticholinergic drugs and MAO-B inhibitors [17].

Dopamine agonists are considered to be drugs that can induce delusional jealousy symptoms in Othello syndrome. Studies have shown that most patients with both conditions were treated with this group of drugs [18]. In such cases, discontinuing dopamine agonists or reducing the dosage may reduce or completely eliminate the symptoms of Othello syndrome [19]. Such treatment carries the risk of worsening motor symptoms of Parkinson's disease or triggering withdrawal syndromes, making this approach not always feasible.

In such cases, instead of reducing the dopamine agonist dose, atypical antipsychotics such as clozapine, quetiapine, or pimavanserin may be used [5]. In addition to these drugs, improvement was also achieved in patients with Othello syndrome with other neuroleptics (pimozide, fluphenazine, risperidone, sulpiride, aripiprazole, haloperidol, olanzapine), antidepressants (lofeptramine, sertraline, bupropion, paroxetine, escitalopram, fluvoxamine, venlafaxine, nortriptyline) and mood stabilizers (valproate and carbamazepine) [20].

There are also studies showing the effect of intranasal oxytocin in modifying romantic jealousy in the mechanism of strengthening the bond with the partner. This knowledge may have future applications in the treatment of Othello syndrome [21].

The diagnosis and treatment of Othello syndrome can be particularly challenging in patients with co-occurring psychiatric or neurological disorders, such as Parkinson's disease. Therefore, it is extremely important to approach each patient individually and carefully weigh the risks and benefits of any therapeutic intervention.

Conclusion

In summary, Othello syndrome is quite a rare and unknown phenomenon, that should not, however, be underestimated. It is mostly occurring in patients with neurological diseases and as a consequence, can be challenging to cure.

In Parkinson's disease, the medication used can in itself be a cause of such symptoms, as there seems to be a link between the use of dopamine agonists and pathological jealousy in PD patients.

Because of this, treatment of such patients can be difficult and may require modification of pharmacological therapy. However, reducing or discontinuing dopamine agonists must be balanced against the risk of worsening motor symptoms or triggering withdrawal syndromes.

Clinicians should not minimize the profound psychosocial impact of Othello syndrome, which may lead to interpersonal conflict, relationship breakdown, or even violence. It is important to have awareness of such unique syndrome while treating neurological patients.

Disclosure

Author's contributions

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Declaration on the use of AI

In preparing this manuscript, the authors used ChatGPT for language improvement and enhancing readability. Following the use of this tool, all content was reviewed and edited by the authors, who take full responsibility for the accuracy and integrity of the final version.

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