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Who caused the contamination of the Oder ecosystem? The influence of media coverage on the formation of a delusional system – a case study

Kto doprowadził do zanieczyszczenia ekosystemu Odry? Wpływ relacji medialnych na kształtowanie systemu urojeniowego – opis przypadku

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Abstract

The aim of this study was to illustrate the impact of highly publicised events on delusional systems, through what appears to be the first description of delusions modulated by an ecological catastrophe. The case concerns a patient who experienced the first episode of psychotic depression with dominant delusional beliefs about the influence of past professional mistakes on the contamination of a river. The formation of the patient's delusional circle originated from the events of 27 July 2022, when Polish society was shaken by the news of water contamination and massive animal die-off in the Oder River. The incident became the main topic of news releases and conversations in society. The study draws attention to the need for significant flexibility in conceptualising the content of delusions. The thematic scopes of delusions can indeed undergo considerable plasticity in response to socio-demographic, political, or even ecological events.

Keywords: major depressive disorder, delusions, water pollution, ecological and environmental phenomena, psychotic affective disorders

Streszczenie

Celem badania było ukazanie wpływu aktualnych i wywołujących burzliwe emocje wydarzeń na systemy urojeniowe poprzez pierwszy na świecie opis urojeń modulowanych przez katastrofę ekologiczną. Przedstawiono przypadek pacjenta, który doświadczył pierwszego epizodu depresji psychotycznej z dominującymi urojeniami dotyczącymi wpływu dawnych błędów zawodowych na zanieczyszczenie rzeki. Powstanie kręgu urojeniowego pacjenta miało swoje źródło w wydarzeniach z 27 lipca 2022 roku, kiedy to polskim społeczeństwem wstrząsnęły wiadomości o zanieczyszczeniu wody i masowym wymieraniu zwierząt w Odrze. Sytuacja rzeki stała się w tamtym czasie głównym tematem doniesień medialnych i rozmów w społeczeństwie. Celem autorów jest zwrócenie uwagi na konieczność znacznej elastyczności w myśleniu o treściach urojeń. Tematyczne zakresy urojeń mogą podlegać znacznej plastyczności w obliczu wydarzeń społeczno-demograficznych, politycznych, a nawet ekologicznych.

Słowa kluczowe: ciężki epizod depresji, urojenia, zanieczyszczenie wody, zjawiska ekologiczne i środowiskowe, psychotyczne zaburzenia afektywne

INTRODUCTION

The prevalence of depression in the European population aged 15 to 100 is estimated at 4 individuals per 1,000, with psychotic symptoms occurring in up to 18.5% of them (Ohayon and Schatzberg, 2002). Psychotic depression is considered the most severe form of depression, associated with a higher number of suicide attempts and a higher recurrence rate. The course of the disease involves significant psychomotor disturbances, impairment of cognitive functions, and mood-congruent delusions (Serretti et al., 1999; Thakur et al., 1999; Wagner et al., 2011). Among patients with psychotic depression, delusions of guilt, impoverishment, and hypochondria are common, at times reaching their most severe form – Cotard's syndrome (Berrios and Luque, 1995; Bürgy, 2017).

This article provides a description of a patient with symptoms of parkinsonism, who experienced an episode of psychotic depression in connection with a temporal ecological disaster in the Oder River, with dominant delusional beliefs about the impact of his past professional mistakes on the aquatic ecosystem. The formation of the patient's delusional system originated from events of 27 July 2022, when Polish society was shaken by news of mass wildlife deaths in the second-longest river in Poland, the Oder River. Initially unidentified factors affected the environment along a 500-km stretch of the river, leading to ecosystem contamination. Between July and September 2022, 360 tons of dead fish were removed from the water. Owing to the scale of mortality and the fact that the diverse ecosystem of the Oder River provides habitat for many animal species, the events were described as the largest recorded catastrophe in the region. Based on research conducted by scientists, including those from the Leibniz-Institute for Freshwater Ecology and Inland Fisheries, who detected *Prymnesium parvum* algae in water samples from the Oder River in August 2022, potential causes of the ecological disaster were determined. The likely factor that led to fish death was a bloom of *Prymnesium parvum*, made possible by the discharge of highly saline industrial wastewater containing high concentrations of phosphorus and nitrogen (Free et al., 2023; Marchowski and Ławicki, 2023).

MATERIALS AND METHODS

The patient's history

Mr. K., a retired water and sewage inspector, who had been receiving treatment for recurrent depression for 20 years, was admitted to the Psychiatric Ward due to a deterioration in mental state. He had been hospitalised psychiatrically several times before. During his most recent stay in 2013, the patient underwent electroconvulsive therapy (ECT) and was started on pharmacological treatment with olanzapine at a dose of 10 mg daily and fluoxetine at a dose of 20 mg daily, resulting in full remission. He remained asymptomatic from that time until the first quarter of 2022.

Approximately five months before presenting to the hospital, despite ongoing therapy, the patient began isolating himself from his loved ones, lost interest in activities that previously brought him pleasure, and significantly reduced his daily activity. He experienced a decline in mood, motivation, and energy, accompanied by increasing anxiety. One month before admission, when reports of an ecological disaster on the Oder River emerged in the media, the retired inspector delusionally assumed responsibility for the contamination. He informed his closest relatives that the pollution occurred due to a professional mistake he allegedly made 25 years earlier. He claimed that, at that time, he mistakenly connected the discharge of industrial wastewater to the rainwater drainage system instead of the proper sewage network. Additionally, he admitted to installing a "defective water distiller" which he believed to be the source of the current crisis on the Oder River.

His delusions grew stronger, inducing extreme psychotic anxiety associated with the expectation of impending investigation that he would become the subject of. He anticipated being promptly summoned for interrogations and local prosecutor visits, as well as facing criminal and financial liability imposed by the Department of Environment. During this time, he developed escalating suicidal thoughts and, in the week preceding hospitalisation, he purchased over-the-counter sleep aids from the pharmacy with the intention of self-harm. The conviction of ethical righteousness in confessing his supposed professional neglect to law enforcement authorities prevented him from carrying out the act, leading him to urge his wife to inform the police about his wrongdoing.

Medical diagnosis and hospital stay

The patient agreed to be hospitalised in the Psychiatry Department. Upon admission, the consulting psychiatrist assessed the patient's awareness as clear and his orientation as intact. The patient's mood was characterised by profound depression, with poorly modulated affect and slowed psychomotor drive and thought processes. The man was reticent, primarily focused on delusional content related to guilt, impending punishment, and financial ruin. He did not appear to experience hallucinations, denied any delusions, but confirmed suicidal thoughts, while simultaneously denying any inclination to act on them. He had no history of alcohol or substance abuse. In the family history, the information about Mr. K.'s father's suicide emerged as particularly significant.

According to the spouse's account, approximately two months before the onset of depressive symptoms, the man's gait became slower and his steps smaller. There was also noticeable intentional tremor in the upper limbs. One month prior to hospitalisation, Mr. K. went to a neurologist who diagnosed Parkinson's disease (PD) and initiated treatment with levodopa and benserazide, with a total daily levodopa dose of 250 mg. Due to coexisting type 2 diabetes and hypertension, the patient was also taking metformin and telmisartan.

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Laboratory tests performed upon admission did not reveal any significant abnormalities. However, during the physical examination, mild cogwheel rigidity was noticeable in the upper limbs, as well as motor slowing. Neurological consultations were conducted, confirming the accuracy of PD diagnosis made on an outpatient basis, while simultaneously excluding drug-induced parkinsonism.

During the initial stage of hospitalisation, Mr. K. exhibited extreme psychotic anxiety, agitation, and preoccupation with depressive psychosis. In the psychometric assessment, the severity of symptoms on the Beck Depression Scale was 48 points, and 47 points on the Hamilton Depression Rating Scale (17-HAMDR). Previous antidepressant pharmacotherapy was discontinued, and replaced with sertraline up to 200 mg per day and quetiapine up to 800 mg per day. However, due to the lack of therapeutic effect, quetiapine was switched to sulpiride up to 1,000 mg per day. Given the significant degree of treatment resistance and considering the beneficial effects of clozapine in treating psychotic depression in PD patients, sulpiride and sertraline were discontinued, and clozapine was initiated at a dose of 250 mg per day with routine monitoring of blood counts. Clozapine-induced sialorrhea was effectively managed with atropine drops (Chang and Fox, 2016; Van der Poorten and De Hert, 2019). Additionally, the patient was enrolled in the primary series of ECT with a total of 15 treatments. Adequate response to the treatments was observed, without any complications.

During the initiation of clozapine, the patient contracted mild COVID-19. Consequently, the ECT procedures were postponed, and a temporary expansion of the delusional system was observed. Mr. K. assumed responsibility for infecting the ward with the virus through alleged inadequate personal hygiene during telephone conversations with his wife. However, after increasing the clozapine dose to 200 mg, the delusional content gradually faded. After a negative test for SARS-CoV-2 was obtained, the ECT was resumed, resulting in increased activity, reduced psychotic anxiety, improved well-being, and increased motivation. The patient regained his appetite, and the quality of his sleep improved. In conversations with his wife, he inquired about the family, his beloved dog, and expressed interest in his hobbies. Encouraged, he started actively participating in therapeutic activities. During individual interviews, some lingering slowing of thought processes was observed, and Mr. K. indicated persistent anhedonia and profound mood depression. When asked, he reported the disappearance of delusions regarding the ward's COVID-19 infection. However, he maintained a delusional interpretation of past events related to the contamination of the Oder River and the impending punishment awaiting him, though the topic no longer occupied the patient's full focus during conversation.

RESULTS

Under the influence of intensified pharmacotherapy with clozapine at 250 mg and the completion of 15 ECT sessions, full remission was achieved in terms of psychotic disorders and suicidal thoughts. There was a normalisation of circadian rhythms, stabilisation of mood, improvement in affect modulation, and acceleration of thought processes. In psychometric assessments, the patient scored 6 points on the 17-HAMDR scale and 4 points on the Beck Depression Inventory. Residual depressive symptoms, in the form of reduced complex activity and diminished spontaneity in actions corresponding to the pattern of his daily activities in recent years, persisted until the end of hospitalisation.

DISCUSSION

The presented case is the first documented description of delusions in the course of psychotic depression modulated by an ecological catastrophe that dominated national media coverage. In the considerations on the pathogenesis of Mr. K.'s condition, it is necessary to take into account the coexistence of three significant factors: the ongoing depressive episode, the personal interpretation of the retired inspector of the Oder River catastrophe, and the initiation of levodopa treatment for PD. The introduction of levodopa treatment may induce the onset of psychotic symptoms through the stimulation of dopaminergic transmission (Factor SA et al., 1995; Moskovitz et al., 1978; Samudra et al., 2016). Owing to his age and a history of depression, the described patient belongs to a high-risk group for adverse effects associated with levodopa therapy. These components, combined with the media-driven informational chaos related to defining the scale of the Oder catastrophe, ultimately manifested clinically as psychotic depression with atypical delusional content.

To date, there have been no other reports discussing the impact of the destruction of the local ecosystem on the formation of delusional beliefs. However, the described symptoms fit into a broader pattern of delusions modulated by socio-political factors. Sher (2000) divided current events into two groups: public events widely reported by the media but not personally stressful, and stressful social situations that affect everyone.

The first category includes the patient described by Sher (2000), who experienced psychotic symptoms, claiming to have secret connections with the UN, the Pope, and O.J. Simpson. The backdrop for these beliefs was the visit of Pope John Paul II, the 50th anniversary of the UN alliance, and O.J. Simpson's trial, widely publicised in the media. In 1996, Kelly, based on an English patient, demonstrated how media campaigns can entangle fact and fiction within delusional beliefs. He described a patient who believed that the Labour Party was sending her messages via a satellite dish and controlling her actions. The patient also believed that the Party wanted to kill her. When asked to explain on what grounds she suspected that the Labour Party was involved in her persecution, she cited the political slogan "New Labour New Danger" (Kelly, 1996).

Among socially stressful events affecting the entire community and potentially modulating the course of psychoses,

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the recent SARS-CoV-2 pandemic and the associated social isolation and restrictions represents a notable example. The first documented patient with psychotic symptoms was a resident of Madrid, treated for bipolar affective disorder, who, four days before the first confirmed SARS-CoV-2 infection in the Spanish capital, began experiencing derealisation and notice unusual behaviours in people around her. She interpreted this as transformation into zombies due to the new coronavirus (Ovejero et al., 2020). In medical databases, examples of delusions with religious and spiritual content, as well as hypochondriacal delusions with somatic symptoms identical to those of COVID-19, can be found in patients who have been ruled out for SARS-CoV-2 infection and were not previously treated psychiatrically (D Agostino et al., 2021). In one case study of a man treated for schizophrenia, hypochondriacal delusions led to self-mutilation using chemical substances applied to the skin and eyes under the belief of contact with the virus (Morillo-González et al., 2020). In 2022, Cyran et al. documented delusions influenced by the presence of the new coronavirus in a man who experienced the first episode of psychotic depression. The patient held delusional beliefs of severe illness and imminent death, as well as a conviction of transmitting the virus to others, anticipating imprisonment as a consequence. These delusions remained uncorrected despite negative test results for SARS-CoV-2 infection (Cyran et al., 2022). Similar to the case of Mr. K. reported here, media coverage of the pandemic became embedded into the content of the patient's expressed delusions.

Shanbour et al. (2020) drew attention to patients who acquire knowledge from "information-filtering bubbles". The authors emphasised the influence of social isolation and infodemic, which refers to an excess of information, including false or misleading content, during epidemics, on shaping delusions. Three patients exposed to the infodemic were admitted to psychiatric care with beliefs about the spread of the SARS-CoV-2 virus via nearby 5G telecommunication towers, delusions of atypical pregnancy modulated by COVID-19, and psychosis with religious auditory hallucinations portraying themselves as the Son of God and a messenger tasked with combating COVID-19 (Shanbour et al., 2020). The documented cases in the aforementioned study share similarities with the patient described here, who was exposed to an excess of information about an ecological catastrophe. Numerous theories about the causes of the contamination reached him, presented daily through media channels. Similarly to patients during the pandemic era, Mr. K. lived in isolation, which, however, originated from a relapse of depression and internal factors rather than external restrictions.

CONCLUSIONS

The common denominator connecting Mr. K. with the other described patients appears to be the malleability of their delusional systems, shaped largely by their environment. Mr. K., initially absorbed by the popular and widely publicised issue of river pollution, developed a belief in his own guilt after being informed of his SARS-CoV-2 infection, suspecting ways in which he could have caused the ward's contamination. Other patients exposed to media reports and online articles and forum discussions displayed a similar inclination to create and expand delusional systems based on current significant issues in their communities. The above considerations highlight the need for considerable flexibility in thinking about the contents of delusions in the course of various medical conditions. The thematic scopes of delusions can indeed be adjusted to changing external factors, including socio-demographic, political, or even ecological events. Moreover, the case of Mr. K. underscores the importance of a comprehensive perspective on the patient, whose symptoms represent a unique interplay of global circumstances, personal vulnerability, the burden of PD, and the adverse effects of levodopa treatment.

Conflict of interest

The authors do not report any financial or personal connections with other persons or organisations which might negatively affect the content of this publication and/or claim authorship rights to this publication.

Author contribution

Original concept of study; critical review of manuscript; final approval of manuscript: PR, JKK, KK. Collection, recording and/or compilation of data; analysis and interpretation of data; writing of manuscript: PR, JKJ.

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