

Acute psychosis in a 35-year-old woman. Could it be related to a previous COVID-19 infection? A case report

Iga Stokłosa¹, Sylwia Bulanda², Karolina Lau²,
Jadwiga Jońko-Ochojska²

¹Chair of Psychiatry, Faculty of Medical Sciences in Zabrze,
Medical University of Silesia in Katowice

²Chair and Department of Environmental Medicine and Epidemiology,
Faculty of Medical Sciences in Zabrze, Medical University of Silesia in Katowice

Summary

The SARS-CoV-2 virus is the cause of the COVID-19 disease. Infection can take a wide variety of forms, from asymptomatic to severe, with numerous complications that can even lead to death. Since the beginning of the pandemic, numerous studies have been carried out to find out the exact expression of the virus. COVID-19 infection also increases the risk of developing neuropsychiatric symptoms, including psychosis.

The paper presents the case of a 35-year-old woman with no prior psychiatric interview who developed acute psychosis after being infected with COVID-19. She was treated in the standard way: haloperidol, lorazepam and diazepam. The symptoms disappeared quickly.

At the moment, the long-term consequences of SARS-CoV-2 infection are not known, therefore further observation and research in this direction is necessary. Treatment, as shown in this case report, appears to be supportive and symptomatic. The optimal antiviral treatment has yet to be clearly defined, and research into the best treatment for the virus itself is still ongoing.

Key words: COVID-19, SARS-CoV-2, acute psychosis, post-covid symptoms

Introduction

Psychosis is a direct physiological disorder of an individual's attention, cognition and consciousness. It is associated with delirium and hallucinations [1]. Cognitive disorders include deficits in memory, speech and perception of the environment, the intensity of which varies throughout the day [1]. The most common type of psychotic symptoms are hallucinations [2]. Their etiology is manifold. During the SARS-CoV-2 pandemic, an increased number of patients with episodes of psychosis is reported [3–5].

SARS-CoV-2, the virus that causes COVID-19, primarily affects the respiratory system, leading to impairment of its function. Symptoms varying in severity, ranging from mild flu-like symptoms to acute respiratory distress syndrome, are observed. The manifestation of COVID-19 is not limited to the respiratory system. A growing number of scientific reports indicate the presence of a diverse spectrum of neuropsychiatric symptoms in a significant percentage of COVID-19 patients. Due to the variability of the neuropsychiatric presentation of COVID-19, many mechanisms have been proposed to explain the pathophysiology of these symptoms [6].

Patients with viral CNS infections may develop neuropsychiatric syndromes that affect cognition, behavior and perception. Therefore, some studies show that coronaviruses can be detected in the spinal fluid of people with seizures, encephalitis, or spinal cord inflammation. Neuropsychiatric symptoms in these individuals may result from damage to the CNS as a result of direct viral toxicity, an immune response, or therapy. Significant release of interleukins and chemokines in patients with severe COVID-19 is associated with neurological inflammation and brain damage [7].

This paper presents a case of psychosis characterized by auditory hallucinations and atypical behavior after a previous mild SARS-CoV-2 infection. The patient's diagnostics did not reveal any possible causes of psychosis. The patient gave informed consent to the publication of her case report.

Case report

A 35-year-old female patient was admitted to hospital as a matter of emergency due to unusual behavior observed by her husband and colleagues. The woman showed signs of developing psychosis in the form of illogical statements, disorganized thinking, insomnia, and visual and auditory hallucinations lasting for about a week, increasing in the days preceding admission. From few days before the onset of mental disorders, the patient had an increased level of work-related stress. The patient has never been psychiatrically hospitalized before and has not received any outpatient psychiatric treatment.

The patient has higher education, Ph.D. degree, remains professionally active. She comes from a complete family, she has a younger brother. In the patient's account, the father abused alcohol and attempted suicide once (the patient reported that the attempt was manipulative). There is no pattern of mental disorders in the form of psychosis in the family history. She is currently married, has two children, and describes the relationship in her own family as correct. Patient with asthma and allergy to salicylates. Besides, she does not suffer from epilepsy, she has not had head injuries with loss of consciousness. She has a negative history of psychoactive substances and alcohol use.

Three months before the development of psychiatric disorders, the patient was diagnosed with COVID-19 infection based on the RT-PCR test. The SARS-CoV-2 infection was poorly symptomatic. The symptoms of the infection improved spontaneously within 14 days of self-isolation. There were no acute events such as psychosis, depression or suicidal thoughts during self-isolation. The patient did not take any medications for COVID-19 during her illness.

On admission to a psychiatric hospital, the patient was conscious, autopsychologically and allopsychically unoriented, in difficult logical contact due to formal thinking disorders. The way of thinking was disorganized, distracted, multi-threaded statements, beyond the line of questions. Labile mood, increased psychomotor drive, maladjusted, lively affect. Visible delusional interpretation of reality. Oneiric delusions were spontaneously expressed, and delusions of reference were also present periodically. The patient experienced auditory hallucinations in the form of voices praising her. She categorically denied suicidal thoughts. For several days, the patient had insomnia, manifested in difficulties with falling asleep and maintaining continuous sleep, she slept for about 2 hours during the day.

Initially, in order to reduce strong psychomotor agitation and productive symptoms, the patient was given 1 ampoule of haloperidol 5mg/ml and 1 ampoule of benzodiazepines 10mg/2ml intramuscularly, and on the same day, aripiprazole was started at a dose of 15 mg/d, increasing the dose within two days to a maximum dose of 30 mg/d. For the first three days of hospitalization, intramuscular haloperidol was additionally administered due to the difficult cooperation with the patient in the field of selective oral medications, and lorazepam at a maximum dose of 2.5 mg/day and diazepam at a maximum of 5 mg/day were administered periodically. Based on the hospital policy regarding hospitalization, a COVID-19 test was performed and found to be negative. Laboratory parameters (morphology, electrolytes, creatinine, liver tests) were normal. Computed tomography of the head with contrast was performed and drug tests were performed – the results showed no abnormalities. During the stay in the hospital, psychotherapeutic interventions were initiated and a psychological consultation was performed. The patient quickly adapted to hospital conditions and made contact with other patients.

Within three days of hospitalization, the patient's psychotic symptoms and delusional content disappeared completely. Improvement in thinking disorders, mood balancing, drive, and insomnia was achieved. It was possible to establish full logical contact with the patient. The period of productive disorders was subject to partial amnesia.

After 2 weeks of hospitalization, the patient was discharged home in clear awareness, comprehensively oriented, in a well-balanced mood, with no thought disorders, no signs of active psychosis, and a diagnosis of acute psychotic disorders.

Discussion

This article describes a patient with no prior psychiatric history who developed acute psychosis. Despite the research, the etiology of its symptoms has not been identified. A quick onset without prior psychological symptoms was considered a very unusual symptom. In the recent past (3 months earlier), she suffered from COVID-19, so the authors suspect that psychosis may be a complication of SARS-CoV-2 infection.

There are case reports in the literature of patients who experienced episodes of sudden and short psychosis related to COVID-19 infection [2, 6, 8–15]. The cited studies describe people who were actively infected with SARS-CoV-2 during psycho-

sis. However, there are reports that also patients who have experienced COVID-19 developed late psychotic symptoms [16, 17]. The neuropsychiatric symptoms related to COVID-19 have been described mainly in young or middle-aged people without comorbidities [6, 12, 13, 15].

An analysis of past pandemics, SARS-CoV-1 and MERS epidemics, showed that such complications can occur at very variable times, ranging from weeks after resolution of acute respiratory symptoms to many years after infection. The short-term consequences of SARS-CoV-2 for mental health are described both among patients in the acute phase of infection and in seronegative convalescents [18].

Hallucinations, deliriums and auditory hallucinations occurred most frequently during psychosis correlated with COVID-19 infection [15, 19]. Also, insomnia is common among such patients [16]. Psychiatric symptoms usually disappear quickly after the implementation of classic pharmacological treatment [10, 16]. As knowledge of etiological factors grows, it is possible that more specific therapies will be developed [20].

Neuropsychiatric disorders affect a significant proportion of people who come into contact with the SARS-CoV-2 pathogen. Scientists suggest that inflammation of the nervous system, neurotrophic SARS-CoV-2 infection, hypoxia, cerebrovascular events, and steroid treatment contribute to mental disorders in COVID-19. However, there is still no clear position of scientists on the pathomechanism of COVID-19-related psychoses [18].

One of the causes of CNS inflammation and, consequently, neuropsychiatric symptoms are immune mechanisms. Immune triggers have long been involved in the pathogenesis of mental illness, including depression and psychotic disorders such as schizophrenia. The literature describes the so-called infectious psychoses. Neuropsychiatric symptoms can be caused by infection with viruses: HIV, rubella, cytomegalovirus, mononucleosis, herpes, measles, toxoplasmosis or bacteria *Borrelia burgdorferi*, *Treponema pallidum*, and other infectious agents [15, 21–24]. Probably the reason for the psychiatric manifestation is the increase in the concentration of some cytokines during these infections [21, 22].

It has been hypothesized that human coronaviruses and other respiratory viruses may act as opportunistic pathogens of the CNS since they have been shown to have neuroinvasive properties [25]. Other coronaviruses, such as SARS-CoV-1, have shown the ability to access the central nervous system via retrograde axonal transport from peripheral nerves, primarily the olfactory nerve. On this basis, it is believed that SARS-CoV-2 may have a similar neuroinvasive potential that may lead to encephalitis and/or neuropsychiatric complications. Another suggested mechanism is the increased permeability of the blood-brain barrier due to the profound systemic inflammation that allows SARS-CoV-2 infected lymphocytes to enter the CNS [6].

It has also been suggested that overactivation of mast cells is the cause of COVID-19-induced psychosis. Both peripheral and central mast cells are overstimulated during COVID-19, and mast cell activation is associated with an increased risk of psychiatric symptoms and illnesses, including paranoid psychosis. Moreover, it has been suggested that the psychological stress caused by the COVID-19 pandemic or

the diagnosis of COVID-19 infection is another factor contributing to the development of mental illness [6].

The authors of the study also looked for other mechanisms that could cause acute psychosis in the described patient. The literature shows that psychoses appear in most cases in early adulthood [26, 27]. Psychotic disorders are often preceded by early symptoms of psychopathology in childhood [28]. The patient did not provide any possible mental problems from childhood.

Very often, psychosis is characterized by a family occurrence. The strongest known risk predictor is having a close relative who is affected by it – which indicates a genetic basis [28]. The family history shows that the patient's father may have had undefined mental problems, as indicated by a suicide attempt.

Epidemiological studies show strong and consistent associations between multiple environmental exposures and psychosis [29]. The literature shows a positive correlation between the prevalence of psychosis in adulthood and membership in a minority, low socioeconomic status, unequal or low income, migration, city life, and head injuries [28]. In the described case, the environmental trigger could be the sheer volume of duties, city life and prolonged stress. According to Nugent et al. [30] stress is the cause of acute non-affective psychosis.

Recapitulation

The mechanism of psychosis in the described patient is not clear, it may be associated with increased stress in the environment or a psychosis which is a post-covid complication caused by a history of SARS-CoV-2 infection.

The emerging COVID-19 psychosis and the potential immune-mediated neuropathogenesis described in this article require further research. It is uncertain what are the mechanism by which COVID-19 may cause psychiatric symptoms. The neuropsychiatric symptoms of COVID-19 and their potential pathomechanism also require scientific explanation. Of particular difficulty are cases in which post-covid complications developed.

References

1. Gaebel W, Zielasek J. *Focus on psychosis*. Dialogues Clin. Neurosci. 2015; 17(1): 9–18.
2. Tobechukwu CA. *Persistent hallucinations in a 46-year-old woman after COVID-19 infection: A case report*. Cureus 2020; 12(12): e11993.
3. Heitzman J. *Impact of COVID-19 pandemic on mental health*. Psychiatr. Pol. 2020; 54(2): 187–198.
4. Talarowska M. *Funkcjonowanie poznawcze po przebytej infekcji wirusem SARS-CoV-2*. Neuropsychiatr. Neuropsychol. 2021; 16(3–4): 109–115.
5. Faculty of Psychology, University of Warsaw. *Zdrowie psychiczne w czasie pandemii COVID-19. Raport wstępny z badania naukowego kierowanego przez dr hab. Małgorzatę Dragan*. <http://psych.uw.edu.pl/2020/05/04/zdrowie-psychiczne-w-czasie-pandemii-covid19-raport->

- wstepny-z-badania-naukowego-kierowanego-przez-dr-hab-malgorzate-dragan/ (retrieved: 1.09.2023).
6. Elfil M, Selby L, Van Schoonevel TC, Fadulb N. *Acute psychosis associated with recent SARS-CoV-2 infection: A case report*. IDCases 2021; 24: e01140.
 7. Lorenzo-Villalba N, Jannot X, Syrovatkova A, Michel V, Andrès E. *SARS-CoV-2 infection and psychiatric manifestations in a previous healthy patient*. Caspian J. Intern. Med. 2020; 11(Suppl 1): 566–568.
 8. Steardo L Jr, Steardo L, Verkhatsky A. *Psychiatric face of COVID-19*. Transl. Psychiatry 2020; 10(1): 261.
 9. Garakani A. *Commentary on 2 cases of neuropsychiatric symptoms occurring in association with COVID-19*. J. Psychiatr. Pract. 2021; 27(2): 145–146.
 10. Smith C, Komisar J, Mourad A, Kincaid B. *COVID-19-associated brief psychotic disorder*. BMJ Case Rep. 2020; 13(8): e236940.
 11. Parker C, Slan A, Shalev D, Critchfield A. *Abrupt late-onset psychosis as a presentation of Coronavirus 2019 Disease (COVID-19): A longitudinal case report*. J. Psychiatr. Pract. 2021; 27(2): 131–136.
 12. Alvarez-Cisneros T, Lara-Reyes A, Sansón-Tinoco S. *Hiccups and psychosis: Two atypical presentations of COVID-19*. Int. J. Emerg. Med. 2021; 14: 8.
 13. Mawhinney J, Wilcock C, Haboubi H, Roshanzamir S. *Neurotropism of SARS-CoV-2: COVID-19 presenting with an acute manic episode*. BMJ Case Rep. 2020; 13(6): e236123.
 14. Varatharaj A, Thomas N, Ellul M, Davies N, Pollak T, Tenorio E. *Neurological and neuropsychiatric complications of COVID-19 in 153 patients: A UK-wide surveillance study*. Lancet Psychiatry 2020; 7(10): 875–882.
 15. Ferrando S, Klepacz L, Lynch S, Tavakkoli M, Dornbush R, Baharani R et al. *COVID-19 psychosis: A potential new neuropsychiatric condition triggered by novel coronavirus infection and the inflammatory response?* Psychosomatics 2020; 61(5): 551–555.
 16. Correa-Palacio A, Hernandez-Huerta D, Gómez-Arnau J, Loeck C, Caballero I. *Affective psychosis after COVID-19 infection in a previously healthy patient: A case report*. Psychiatry Res. 2020; 290: 113–115.
 17. Baral N, Adhikari G, Karki S, Champine A, Sud P. *Does social stigma and neglect post-COVID-19 matter? A case report on brief psychotic disorder post-COVID-19 and self-quarantine*. Cureus 2021; 13(1): e12973.
 18. Mosiołek J, Jakubczak P, Mosiołek A. *Powikłania neuropsychiatryczne związane z COVID-19 – przegląd kliniczny*. Psychiatria 2021; 18(3): 232–240.
 19. Smith C, Gilbert E, Riordan P, Helmke N, Isenburg von M, Kincaid B et al. *COVID-19-associated psychosis: A systematic review of case reports*. Gen. Hosp. Psychiatry 2021; 73: 84–100.
 20. Gillett G, Jordan I. *Severe psychiatric disturbance and attempted suicide in a patient with COVID-19 and no psychiatric history*. BMJ Case Rep. 2020; 13(10): e239191.
 21. Rybakowski F. *Znaczenie zakażeń wirusowych w etiopatogenezie schizofrenii*. Wiad. Psychiatry. 2000; 3: 169–173.
 22. Brown AS. *Prenatal infection as a risk factor for schizophrenia*. Schizophr. Bull. 2006; 32(2): 200–202.
 23. Grzywa A, Makara-Studzińska M, Grzywa-Celińska A. *Zaburzenia psychiczne a choroby somatyczne*. Curr. Probl. Psychiatry 2011; 12(1): 67–72.

24. Brodziński S, Nasierowski T. *Psychosis in Borrelia burgdorferi infection – part II: case reports*. Psychiatr. Pol. 2019; 53(3): 641–653.
25. Desforges M, Coupanec AL, Dubeau P, Bourgouin A, Lajoie L, Dubé M et al. *Human coronavirus and other respiratory viruses: Underestimated opportunistic pathogens of the central nervous system?* Viruses 2019; 12(1): 14.
26. Smith K. *Trillion-dollar brain drain*. Nature 2011; 478(7367): 15.
27. Reininghaus U, Dutta R, Dazzan P, Doody GA, Fearon P, Lappin J et al. *Mortality in schizophrenia and other psychoses: A 10-year follow-up of the AESOP first-episode cohort*. Schizophr. Bull. 2015; 41(3): 664–673.
28. Zwicker A, Denovan-Wright E, Uher R. *Gene-environment interplay in the etiology of psychosis*. Psychol. Med. 2018; 48(12): 1925–1936.
29. Marconi A, Di Forti M, Lewis C, Murray RM, Vassos E. *Meta-analysis of the association between the level of cannabis use and risk of psychosis*. Schizophr. Bull. 2016; 42(5): 1262–1269.
30. Nugent K, Paksarian D, Mojtabai R. *Nonaffective acute psychoses: Uncertainties on the way to DSM-V and ICD-11*. Curr. Psychiatry Rep. 2011; 13(3): 203–210.

Address: Sylwia Bulanda

Chair and Department of Environmental Medicine and Epidemiology

Faculty of Medical Sciences in Zabrze

Medical University of Silesia in Katowice

e-mail: bulanda.sylwia@gmail.com