

THE PSYCHIATRIC CONSEQUENCES OF LONG-COVID IN ADOLESCENTS. A CASE REPORT

Ilgojo COVID sindromo poveikis paauglių psichikos sveikatai. Klinikinis atvejis

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SUMMARY

There are no diagnostic tests or consent international definition for long COVID in children [1]. Long-COVID is a typical condition of adults with a history of probable or confirmed SARS-CoV-2 infection in the previous 3 months and with symptoms lasting over 2 months not explained by an alternative diagnosis [2]. We present a case report of a 16 year old girl, who experienced mental health decline after SARS-CoV-2 infection that manifested with depressive symptoms. Patient's mental and somatic condition was evaluated 5 times in one year period and once again after 2 years. Patient attended psychotherapy and was treated with Fluoxetine up to 20 mg a day for reduction of depressive and anxiety symptoms. A reduction of symptoms was registered 2 weeks after beginning of treatment but 55 weeks after virus exposition symptoms reoccurred. Certain symptoms, such as anxiety, difficulties concentrating, and fatigue, persisted despite the reduction of other symptoms. This case report shows dynamics of long-COVID syndrome in 2 year period.

Key-words: long-COVID syndrome, children, adolescents, mental health

SANTRAUKA

Šiuo metu ilgajam COVID sindromui nėra sutarto tarptautinio apibrėžimo ir diagnostikos metodo pediatrijoje [1]. Remiantis PSO apibrėžimu, ilgojo COVID sindromas – dažnai suaugusiems asmenims pasireiškianti būklė, kuriai būdinga per paskutinius tris mėnesius galima ar patvirtinta SARS-CoV-2 infekcija, lydima dviejų ilgai besitęsiančių kitaip nepaaiškinamų simptomų [2]. Šis klinikinis atvejis aprašo 16 metų merginą, kuriai po SARS-CoV-2 infekcijos sutriko psichikos būklė ir manifestavo depresinė simptomatika. Vienerius metus nuo COVID-19 ligos pasireiškimo pacientės somatinė ir psichikos sveikata vertinta 5 kartus, taip pat mergaitės būklė įvertinta pakartotinai po dviejų metų. Nuotaikos ir nerimo korekcijai taikytas gydymas Fluoksetinu iki 20 mg/p bei psichoterapeuto konsultacijos. Taikant gydymą, po dviejų savaikių stebėta teigiama pacientės psichikos būklės dinamika, tačiau 55 savaitę po užsikrėtimo SARS-CoV-2 infekcija, stebėtas būklės regresas. Tam tikri simptomai – nerimas, sunkumai koncentruoti dėmesį bei nuovargis išliko pasiekus kitų simptomų redukciją. Šis klinikinis atvejis iliustruoja ilgojo COVID sindromo simptomų dinamiką dviejų metų laikotarpiu.

Raktiniai žodžiai: ilgojo COVID sindromas, vaikai, paaugliai, psichikos sveikata

INTRODUCTION

The Long COVID syndrome among children and adolescents has been minimally explored [3]. It has been identified that Long COVID syndrome, characterized by one or more symptoms persisting for 4 weeks post SARS-CoV-2 infection, was present in 25.24% of cases for children and adolescents and 29.19% of hospitalized cases [4]. Various somatic and mental health changes characterize Long COVID syndrome. Patients often report experiencing fatigue, headaches, muscle or joint pain, chest pressure or pain, changes in taste or smell, 'brain fog,' sleep disturbances, difficulties returning to active activities, leading to an increased susceptibility to other diseases [5, 6]. It has also been observed that hospitalized newborns due to SARS-CoV-2 exhibited eating disorders – they refused to eat. Older children displayed increased attachment, distraction, irritability, restlessness, and anger [7].

Three possible explanations for the pathophysiology of Long COVID syndrome have been distinguished: the first hypothesis states that during acute infections, organs that determine long-lasting symptoms are damaged. However, severe cases of COVID-19 are rarely diagnosed in children and adolescents, making this hypothesis unsuitable to explain the mechanism of Long COVID syndrome in this age group. The second hypothesis suggests that the SARS-CoV-2 virus persists in the body after infection, causing long-term symptoms. The third hypothesis is 'autoimmune' – it is believed that antibodies are formed in the patient's body, which 'attack' the body's tissues. None of these hypotheses may be accurate for this age group, as there is a lack of scientific studies evaluating the pediatric and adolescent populations [1]. Mental health changes may have been influenced not only by the virus's impact on health but also by changes related to the epidemiological situation – changes in the environment and lifestyle, quarantine restrictions, distance learning, social distancing.

In Lithuania, the consequences of Long COVID syndrome for children's health have not been assessed, hence presenting a clinical case of Long COVID syndrome to draw the attention of medical practitioners and Lithuanian scientists to the problem of Long COVID, describing the clinical case of a 16-year-old girl.

CLINICAL CASE

The patient (16 years old) sought medical attention due to mood fluctuations, low self-esteem, narrowing of interests, social withdrawal, disrupted sleep, fatigue, and decreased energy following a COVID-19 infection. The patient's father complained that the patient became tearful and expressed anxiety. Concurrently with COVID-19 illness, neurological symptoms (headaches and cognitive impairment – brain fog, memory loss, difficulty concentrating) and rheumatological symptoms (joint pain, tingling in the toes) emerged, leading to referrals for pediatric neurology and pediatric rheumatology consultations. The patient had not been vaccinated against COVID-19. The patient contracted COVID-19 on January 1, 2022. SARS-CoV-2 was not confirmed by PCR testing, but a confirmed COVID case in the close environment was reported in December 2021 and January 2022. The patient received outpatient care for 7 days, experiencing subfebrile temperatures for 4 days. Before contracting COVID-19, the girl had not sought psychiatric

consultations with child and adolescent psychiatrists. About 6 years ago, the girl had attended psychotherapeutic consultations several times due to difficulties in communicating with peers and feelings of loneliness. According to the father, the girl appeared somewhat melancholic before contracting SARS-CoV-2 infection, but a significant deterioration in mental health was observed after the illness. The patient's mental and somatic condition was assessed 5 times per year and once every 2 years using a questionnaire developed by the authors. Additionally, the girl received outpatient psychiatric consultations and treatment.

The evaluation involved a standardized questionnaire with questions about the expression of various psychiatric symptoms, assessing the frequency of symptom manifestation over a 1-month period. The survey took place remotely via video camera, with separate interviews for the girl and her father. Mood, anxiety, phobias, suicidal thoughts, fatigue, loneliness, anger, irritability, distractibility, appetite, and restlessness were assessed using a scoring system (0 points – symptoms never occurred; 1 point – symptoms occurred occasionally; 2 points – frequently; 3 points – very frequently; 4 points – always).

The first assessment of the patient's condition was conducted 10 weeks after COVID-19 infection. The father noted that the patient appeared more sad than happy. The girl constantly seemed fatigued, anxious without reason, and concerned about her health. Loneliness and anhedonia were persistent. The patient often quickly became irritated and angry. Suicidal thoughts and irrational worries occasionally occurred, and she slept slightly less than usual.

At the 12th week post-infection, the patient sought outpatient care from a child and adolescent psychiatrist. The patient was prescribed Fluoxetine capsules, gradually titrated up to 20 mg/day, and this medication regimen was continued throughout the treatment period along with psychotherapy. The girl was re-evaluated 2 weeks after the initiation of medication. Positive dynamics were observed on medication and psychological support: according to the patient and her father, mood improved. However, according to the father, the girl often felt fatigued, occasionally worried without reason or about her health, and appeared lonely. According to the father, episodic suicidal thoughts and anhedonia occasionally occurred, and the girl experienced distractibility. The patient herself reported feeling an improvement in her condition: she expressed experiencing pleasure more often in daily activities but still occasionally worried without reason, mentioned occasional intrusive thoughts, and had difficulty concentrating.

At 27 weeks post-COVID-19 infection (13 weeks from the start of treatment), the patient and her father were contacted again. Significant improvement in the patient's condition was observed. According to the patient and her father, mood improved, suicidal thoughts reduced, and the patient often felt pleasure in daily activities. However, according to the father, the girl often appeared fatigued, occasionally worried without reason or about her health, and seemed lonely. The patient reported feeling often fatigued and started to sleep slightly more than usual, occasionally worrying about her health (Table 1).

At 41 weeks post-COVID-19 infection (27 weeks from the start of treatment), the patient and her father were contacted

Case reports

Table 1. Dynamics of Long COVID Syndrome Symptoms Over a 2-Year Period According to the Patient's Subjective Assessment and the Father's Objective Assessment

Symptoms Manifesting Within a 1-Month Period	Time elapsed post SARS-CoV-2 infection, (weeks)											
	10		14		27		41		55		96	
	Evaluator		Evaluator		Evaluator		Evaluator		Evaluator		Evaluator	
	Patient	Father	Patient	Father	Patient	Father	Patient	Father	Patient	Father	Patient	Father
Fatigue	++++	++++	+	+++	+++	++	++	+	+	++	+	++
Unexplained Anxiety	++	++++	++	++	0	+	0	+	+	+	++	++
Hypochondriasis	0	++++	0	++	+	+	+	+	+	++	0	+
Feeling of Loneliness	0	++++	0	++	0	+	+	++	++	+++	0	+++
Anhedonia	+	0	++	+	++	++	++	+	+	+	+	+
Irritation and Anger	+++	++	+	+	0	+	+	+	+	+	+	++
Suicidal Thoughts	0	+	0	+	0	0	0	0	0	+	0	0
Intrusive Thoughts	0	+	0	+	0	0	0	0	0	0	0	0
Paranoid Thoughts	+	+	0	0	0	0	0	0	0	0	0	0
Difficulty concentrating	+++	++++	+	+	0	0	+	+	0	+	+	+
Fear of Separation from a Close Person	0	0	0	0	0	0	+	0	+	0	0	0
Social Anxiety	0	0	+	0	0	0	0	0	++	0	+	+
Concerns about Appearance and Desire to Lose Weight	0	0	0	0	0	0	0	0	+	0	0	0
Restlessness	0	0	+++	++	+++	++	+++	++	+++	+++	++	++
Specific Phobia	0	0	0	0	0	0	0	0	0	0	+	0

*0 - symptoms never manifested; + symptoms manifested occasionally; ++ - symptoms manifested frequently; +++ - symptoms manifested very frequently; ++++ - symptoms manifested always.

again. According to the father, the patient's mood remained stable, but the girl often appeared lonely. According to the father, the girl only occasionally felt pleasure in regular activities, seemed fatigued, occasionally worried without reason or about her health, and slept slightly more than usual. The patient herself reported often feeling fatigued, occasionally worrying about her health, feeling irritable and lonely, and sleeping slightly more than usual.

After one year (55 weeks) post-COVID-19 infection (41 weeks from the start of treatment), a repeated assessment of symptom dynamics was conducted. A significant deterioration in the condition was observed. The father noted that the girl appeared more cheerful than sad, but very often seemed lonely, frequently appeared fatigued and distracted, and worried about her health. According to the father, episodic suicidal thoughts occurred, and the girl expressed anxiety without reason or fear of being ridiculed by someone close to her. The father mentioned that the patient occasionally became irritated and rarely felt pleasure in daily activities, sleeping slightly more than usual. The patient herself reported often feeling cheerful but often lonely and experiencing social anxiety. The girl occasionally became irritable, felt fatigued, and worried without reason or about her health. The patient only occasionally felt pleasure in daily activities and occasionally had thoughts about losing

weight, mentioning that she slept slightly more than usual.

Almost two years later (96 weeks) post-COVID-19 infection, a repeated meeting was held with the patient and her father. The girl stated that about a year ago, she discontinued Fluoxetine treatment due to a reduction in symptoms. According to the father, the girl felt well during the summer vacation (significant improvement observed in August 2023 (81–85 weeks)). With the start of the school year, the girl's mental state episodically worsened, particularly due to concerns about final exams. At 96 weeks, the father assessed that the girl appeared more sad than happy and very often seemed lonely. The patient often seemed restless, fatigued without reason, easily irritated, and occasionally worried about her health. Occasionally, the girl appeared as if anxious about her health, afraid that someone close to her might ridicule her. The father noted that the patient rarely felt pleasure, engaged in daily activities, provoked anger reactions, and had difficulty concentrating.

In conclusion, this case underscores the complexity and long-term dynamics of mental health symptoms in a pediatric patient post-COVID-19 infection. The presented clinical trajectory provides valuable insights into the potential prolonged impact of Long COVID Syndrome on mental health, emphasizing the need for comprehensive assessments and tailored interventions in children and adolescents.

DISCUSSION

In this clinical case, we present the dynamics of Long COVID Syndrome over a two-year period, manifested by changes in mental health. According to the literature, the most common mental health symptoms of Long COVID Syndrome in adults include fatigue, anxiety, depressive symptoms, difficulty concentrating, disturbed sleep, and memory impairment. While there is limited research assessing the impact of Long COVID Syndrome on children and adolescents, it has been found that fatigue, disturbed sleep, memory and attention issues, depressive symptoms, anxiety, and restlessness occur more frequently in this population [8, 9]. The symptoms observed in the presented patient align with those typically associated with Long COVID Syndrome. Jolanta B Zawilska and colleagues identified fatigue as the most pronounced psychiatric symptom of Long COVID Syndrome in children, adolescents, and adults [10]. In our clinical case, fatigue was the most persistent and prominently reported complaint.

Children and adolescents after COVID-19 infection often report anxiety and depressive symptoms [7]. Currently, the lack of appropriate instruments for assessing the impact of Long COVID Syndrome on the health of children and adolescents makes it challenging to differentiate between Long COVID Syndrome and depressive or anxiety disorders. The clinical case demonstrates that specific symptoms, such as anxiety, fatigue, and attention disturbances, persisted even after the reduction of other depression symptoms. This may suggest a specific association with Long COVID Syndrome and could aid in distinguishing it from depression caused by other factors. The precise differentiation would require a thorough history, assessing whether neuropsychiatric symptoms typical of Long COVID Syndrome manifested or worsened after COVID-19 illness. Additionally, an evaluation of the current epidemiological situation and, if necessary, COVID PCR or antibody testing could contribute to the differential diagnosis. Cozzi et al. found a direct link between Long COVID Syndrome

in adolescents and a general predisposition to psychiatric disorders [8]. Other studies have indicated that dysfunction and duration of symptom manifestation in children and adolescents with Long COVID Syndrome are directly related to their gender and age – symptoms are more pronounced and last longer in girls and adolescents [1]. Therefore, our presented patient falls into a high-risk group.

In a systematic literature review by Yong Bo Zeng and colleagues, it is emphasized that mental health symptoms are most pronounced 6–12 months after SARS-CoV-2 infection ($p < 0.01$). [11] In our described clinical case, the patient's symptoms were most pronounced at the onset of the illness and reduced with the application of both pharmacological and non-pharmacological interventions. The patient's mental state deteriorated again at week 55 (after 12 months), despite continued medication and psychological support. This aligns with the findings of Yong Bo Zeng and colleagues' literature review. After achieving remission, the girl's Fluoxetine treatment was discontinued, resulting in a recurrence of mental health regression. This clinical case demonstrates that the treatment duration for Long COVID Syndrome in adolescents may require a longer period of pharmacological intervention.

In summary, during this post-COVID era, when treating depression and anxiety disorders, it is crucial to consider the possibility of Long COVID, especially when cognitive dysfunction or inadequate treatment response is present. A comprehensive evaluation, including the history of illness and assessment of other Long COVID symptoms, may be needed for longer-term treatment or additional therapeutic measures. Informed consent was obtained from the patient and her father for the case analysis and article publishing. Bioethics number: BE-2-27 (2022-02-22).

Conflict of Interest

No conflicts of interest were reported by the authors during the study.

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