



# COVID-19-Related Brief Insomnia in a 13-Year-Old Adolescent Girl

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## Abstract

Neuropsychiatric manifestations that have developed after coronavirus disease 2019 (COVID-19) infection have not been fully clarified yet. Persistent insomnia and consequent significant impairment in daily functioning is an unexpected symptom of COVID-19 infection. In this case report, a 13-year-old female patient who presented with complaint of insomnia starting with COVID-19 infection is discussed. The patient showed significant improvement with melatonin treatment and maintained her wellbeing in the follow-up. Melatonin may be a useful option to treat COVID-19-related brief insomnia in adolescents. Our case report will be a step forward to help clinicians examine the underlying neurovegetative mechanisms, such as sleep, to improve patients wellbeing. HEADINGS: COVID-19. Melatonin. Sleep Initiation and Maintenance Disorders

## Keywords

- ▶ COVID-19
- ▶ melatonin
- ▶ sleep initiation and maintenance
- ▶ disorders

## Introduction

Insomnia, the Latin word for “no sleep”, is defined as difficulty in initiating or maintaining sleep in affected individuals. However, it is known that the problem experienced is not only limited to sleeping and may lead to deterioration in daytime functionality, a decrease in cognitive performance, fatigue, or depressive symptoms.<sup>1</sup> Especially in adolescents, insomnia is mostly underrecognized, underdiagnosed, and undertreated; because of its complex nature, insomnia can be associated with internalizing problems such as anxiety and depression.<sup>2</sup>

Patients with coronavirus disease 2019 (COVID-19) may manifest a variety of psychiatric symptoms, including headache, insomnia, attention disorders, and anosmia.<sup>3</sup> In the adult population, COVID-19-related insomnia is proven to be a major risk factor for depression and anxiety,<sup>4</sup> but studies in child and adolescent populations are relatively scarce. In the

present case report, we present a 13-year-old female patient who started to experience insomnia after COVID-19 and showed significant improvement with melatonin. The treatment response and implications are also discussed.

## Case Presentation

A 13-year-old female patient presented with insomnia, attention problems, and a mildly depressed mood. Symptom onset occurred when the entire family of five was infected with COVID-19 about a month ago and lasted since then. Before presenting with this complaint, the patient was described as an adolescent who showed normal development, was successful at school, and had no problems in social relations. The patient's mother was a nurse. There were no previous psychiatric diagnoses or family history of any disorder before the COVID-19 infection. The patient stated in the interview that she could not sleep most nights, that she

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woke up with nightmares on the nights she could sleep, and that she had difficulty initiating sleep again. She also stated that she was sleepy during the day, had difficulty paying attention in classes, and her grades had dropped significantly in the last month.

In January, the patient was infected with COVID-19 alongside her parents and two siblings. During the COVID-19 infection period, the mother had symptoms of anxiety, psychomotor agitation, and inability to sleep for a period of 72 hours, but the symptoms lasted for a week and completely resolved afterward. She recovered fully and had no problems continuing to work. Our patient's insomnia started during time she was infected with COVID-19 and continued after recovery. Around mid-February, she presented to the psychiatrist for the first time.

On the mental status examination, the patient was alert and fully oriented. Her demeanor was cooperative, but she looked tired. She had dark circles around her eyes. During the examination, she was engaging in the conversation adequately, although there was a slight delay in responses. Her mood was mildly depressed, affect was consistent with the mood and reactive. Thought process and thought content was appropriate, with no hallucinations, delusions, or suicidal ideation. Her appetite was normal, but she had significant difficulty initiating and maintaining sleep. The medical history was unremarkable. Her Sleep Disturbance Scale for Children (SDSC) score was 62.

After the initial assessment, psychoeducation and sleep hygiene were discussed, a blood sample was taken for laboratory workup, and an appointment was scheduled for a week later. On the second visit, the laboratory workup was unremarkable, and there was no improvement in the patient's complaints. We shaped our case formulation around insomnia, which we consider to be the first among the patient's complaints and the one that impairs functionality the most. As a result of not getting enough sleep, she had attention problems, decreased academic grades, decreased quality of life, and felt depressed. We identified insomnia as the core symptom and chose to treat it primarily.

A treatment course with 3 mg/day of melatonin was started. At the follow-up appointment, 2 weeks later, the patient stated that her symptoms were improving. She stated that she found a lot easier to initiate and maintain sleep and that her sleep problem had gotten significantly better. She also stated that there was an increase in her focus and success in her lessons. Her mood was euthymic, and her SDSC score was down to 37. Overall, the patient responded well to the treatment and kept the improvements in the follow-ups.

## Discussion

Although there are reports of sleep problems in adults in the acute period of COVID-19 in the literature, the data concerning children and adolescents is quite limited. It has been shown that changes in the daily routine during the pandemic process may cause some negative effects on sleep habits, even in those who are not infected.<sup>5</sup> A review showed that

adolescents experience higher rates of anxiety, depression, and stress due to the pandemic.<sup>6</sup> Also, a meta-analysis indicated that preexisting complaints may increase, and new symptoms may start in the pediatric group without any psychiatric history. Anxiety, fear of COVID-19, boredom, and sleep disturbances were the main influencers on the psychological and behavioral impacts of quarantine and confinement.<sup>7</sup> While sleep problems associated with depressive mood were previously thought to be a secondary manifestation, new research shows that there may be a bidirectional relationship.<sup>8</sup> The study by Nahidi et al. showed that insomnia could be a potential risk factor for mental health problems in patients with COVID-19.<sup>9</sup> In the case of our patient, the mother's COVID-19 infection course including insomnia may have played a predisposing role leading to increased stress. Insomnia in the mother during the infection can be interpreted as a genetic predisposing factor. We can think that having a health worker in the family may have increased the risk of exposure and health anxiety and serve as a predisposing variable. As the COVID restrictions continued in the same period, additional stressors, such as difficulty in lessons, limited social activities, and COVID-19-related health concerns, may also have played a perpetuating role. The absence of any previous psychiatric history and comorbid disease, clinically normal intelligence level, and early referral to psychiatry through family support can be considered protective factors.

Melatonin is a natural hormone secreted from the pituitary gland that is involved in the circadian rhythm and is also used as a supplement and medication. It is known that melatonin secretion reaches its maximum level in children and adolescents, decreases gradually with age, and has an effect on neuronal plasticity apart from regulating the sleep/wake cycle.<sup>10</sup> Social jet lag refers to the mismatch between the biological and social clock and is often associated with intense screen use and delayed sleep phase, especially in adolescents. The COVID-19 period may be the trigger for these symptoms. It has been shown that there are changes in social jetlag and that the risk of experiencing insomnia-related symptom increases with COVID-19.<sup>11</sup>

The American Academy of Sleep Medicine recommends melatonin therapy for delayed-sleep phase syndrome and jetlag.<sup>12</sup> There is no consensus on the use of melatonin in the treatment of insomnia in European guidelines.<sup>1</sup> In children with neurodevelopmental disabilities, increasing evidence supports melatonin as the safest choice.<sup>13</sup> However, for normally developing youth, evidence is not as clear. Studies have shown that melatonin reduces sleep latency, usually has none-to-mild side effects, and is well-tolerated in different age groups.<sup>14</sup> Wei et al.'s review shows that melatonin is an effective and tolerable drug in the short-term treatment of sleep-onset insomnia in children and adolescents.<sup>15</sup>

In a review investigating the use of melatonin as a potential adjuvant therapy in COVID-19, it has been stated that its antiinflammatory and antioxidative effects may be beneficial.<sup>16</sup> It is thought that melatonin may reduce hyperinflammation and the effect of free radicals, besides improving sleep problems in COVID-19.<sup>17</sup> Another study showed that

melatonin reduced the length of stay and the risk of delirium in COVID-19 patients hospitalized in the intensive care unit.<sup>18</sup> In a randomized controlled trial, adding oral melatonin to standard therapy significantly improved sleep quality and blood oxygen saturation in hospitalized COVID-19 patients.<sup>19</sup> Although COVID-19 has a mostly benign course in children and usually does not have a permanent effect, it is reported that it is necessary to be aware of the possibility of depression, anxiety, fatigue, posttraumatic stress disorder, and rarer neuropsychiatric syndromes in the long term.<sup>20</sup> As a result, melatonin may be helpful in treating insomnia caused by social jet lag problems triggered by COVID-19 in adolescents. In addition, reducing insomnia symptoms may also lead to a decrease in other psychiatric problems triggered by insomnia.

## Conclusion

With this case report, we aimed to show that there may be some neurovegetative problems under some psychiatric COVID-19-related symptoms, and the treatment of these problems may lead to improvement in the associated areas, such as attention and depressed mood. Considering that the treatment of the mentioned problems can sometimes be easier than that of associated complex situations, we would like to state that it would be important for physicians to carry out detailed examinations in these areas and recognize sleep problems.

### Authors' Contributions

All authors have seen and approved the manuscript.

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No financial support was provided for this case report.

### Conflict of Interests

The authors have no conflict of interests to declare. Work for this case report was performed at Cerrahpaşa Medical Faculty, Child and Adolescent Outpatient Clinic. IUC-Cerrahpaşa institute does not require ethics committee approval for case reports. Informed consent was obtained from the patient and her parents. The Declaration of Helsinki was followed as the standard of medical ethics in the study.

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