Turkish Archives of Pediatrics

SCIENTIFIC LETTER
DOI: 10.5152/TurkArchPediatr.2021.21023

A case with Gaucher disease unable to reach enzyme replacement therapy because of COVID-19 quarantine: The first case from Turkey

Merve Koç Yekedüz, Engin Köse, Fatma Tuba Eminoğlu

Department of Pediatric Metabolism, Ankara University School of Medicine, Ankara, Turkey

Coronavirus disease 2019 (COVID-19) and its virus, severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) first emerged in China in December 2019. It was thought that COVID-19 may take a more severe course because of pulmonary and immune system involvement of inborn errors of metabolism (IEMs) (1).

IEMs are frequent because of consanguinity marriages in Turkey. The impact of the COVID-19 pandemic in lysosomal storage diseases and management challenges with enzyme replacement therapy (ERT) has been reported in the literature. However, this manuscript is the first report from Turkey.

Health systems have changed all over the world because of COVID-19 (2). Disruptions in treatment are as important for IEMs, especially in patients undergoing ERT, as the infection. Home infusion therapy, as the most rational treatment approach to ensuring no disruptions in treatment during the pandemic, is an effective method (3).

In this report, we present a case of Gaucher disease (GD) with COVID-19 whose follow-up and treatment were impaired because of the pandemic. Our intention here is to emphasize that asymptomatic COVID-19 is not so innocent in patients with IEM.

A 13-year-old female patient followed up with a diagnosis of type 1 GD (c.475C>T p.R159W and c.1226A>G p.N409S compound heterozygous mutation) was admitted to our center for a swab polymerase chain reaction (PCR) test for suspected COVID-19.

In her medical history, she had undergone ERT (imiglucerase 30 units/kg/dose every 2 weeks) for 9 years, and the disease was currently under control. Her hemogram parameters were always within the normal range.

A clinical examination revealed no complaints of infection. A swab PCR test for COVID-19 was positive, and the patient was diagnosed with asymptomatic COVID-19. The patient had no complications during the 14-day quarantine. Nevertheless, quarantine was extended because of the second positive swab PCR test after the first quarantine period. Her family's swab PCR tests were subsequently detected positive, one by one. Therefore, quarantine lasted two months for our patient and her family. Because of the quarantine imposed on her, she missed four doses of ERT.

After the quarantine, following a negative swab PCR test, a laboratory investigation showed that the patient's hemoglobin level had decreased from 12.5 g/dL to 10.8 g/dL. Her platelets, which were 170,000/mm3 before COVID-19, had decreased to 143,000. Furthermore, with interruption of ERT, the patient's chitotriosidase level, which had been 5857 nmol/h/mL (RR: 0-120) before contracting COVID-19, increased to 10,130 nmol/h/mL (Table 1).

We would like to emphasize that asymptomatic COVID-19 should not be underestimated in patients with IEM. Interruption in ERT of a patient with GD led to a deterioration in laboratory findings. Asymptomatic infections can have negative impacts on clinical progress in those with IEM, because their access to healthcare services is suspended during the quarantine.

Corresponding Author:
Merve Koç Yekedüz
✉drmervekoc13@hotmail.com
Received: 20.01.2021
Accepted: 28.01.2021
turkarchpediatr.org

Cite this article as: Yekedüz MK, Köse E, Eminoğlu FT. A case with Gaucher disease unable to reach enzyme replacement therapy because of COVID-19 quarantine: The first case from Turkey. Turk Arch Pediatr 2021; 56(3): 270-1.

Table 1. Laboratory findings of patient before and after COVID-19

Laboratory parameters	Before COVID-19	After COVID-19
WBCs (×109/L) (RR: 4.5-12.5)	5.19	6.12
Lymphocytes (×109/L) (RR: 1.5-6.5)	1.53	1.25
Hb (g/dL) (RR: 12-15)	12.5	10.8
Platelets (×109/L) (RR: 150-450)	170.000	143.000
Chitotriosidase (nmol/h/mL) (RR: 0-120)	5857	10.130
AST (U/L) (RR: 0-35)	32	35
ALT (U/L) (RR: 0-35)	10	12

ALT: alanine aminotransferase; AST: aspartate aminotransferase; COVID-19: coronavirus disease 2019; Hb: hemoglobin; WBC: white blood cell.

There is a lack of information about the clinical progress of COVID-19 in patients diagnosed with IEM, although it is thought that, in such patients, the clinical manifestation may be more severe because of the decompensation and impairment of the immune system (1,4,5). The decrease in beta-glucosidase enzyme activity in GD may lead to the accumulation of inflammatory glycosphingolipids. It is related to chronic immune activation (6,7). This creates the prediction that COVID-19 may progress more severely in patients with GD. In a study involving 150 adults and 31 pediatric patients with GD in New York, contrasting data were obtained. It has been reported that 25% of the patients have at least one mild symptom. The most common symptoms are cough, fatigue, and fever. None of the patients needed specific treatment, and there was no death. This research concluded that SARS-CoV-2 does not pose a severe risk for GD as expected (6).

In many IEM centers around the world, working days and hours have been reduced because of the pandemic, and outpatient clinics have even closed in some locations (2,8). In this process, in a study conducted by the European Organisation for Rare Diseases, it was determined that care of 83% of patients with rare disease was disrupted. A total of 60% of patients could not receive infusion therapies. Appointments of 70% of patients were postponed (9). Our patient could not attend the hospital for ERT because of her quarantine for COVID-19, and, as a consequence, she was found to have developed cytopenia and an increased chitotriosidase level. We believe home infusion therapy would be a good solution for lysosomal storage disorders in the pandemic (3). In research conducted in Spain, 113 patients with GD were evaluated. Of the patients who received ERT, 25% reported disruptions during the pandemic. The importance of home infusion therapy is highlighted in the study (10). Unfortunately, home infusion therapy is still uncommon in several countries, Turkey being one.

We hypothesize that, amid the COVID-19 pandemic, which is expected to last for a long time, the healthcare system should be modified to ensure the requirements of patients with IEM are satisfied. Furthermore, home infusion therapy should be promoted for ERT to avoid interruptions to treatments. More studies are needed to evaluate the clinical manifestation of SARS-CoV-2 infections in patients with IEM.

Peer-review: Externally peer-reviewed.

Author Contributions: Concept - M.K.Y., E.K., F.T.E.; Design - M.K.Y., E.K.; Super- vision - F.T.E.; Materials - M.K.Y., E.K.; Data Collection and/or Processing - M.K.Y., F.T.E.; Analysis and/or Interpretation - M.K.Y., E.K., F.T.E.; Literature Review - M.K.Y.; Writing - M.K.Y., E.K., F.T.E.; Critical Review - M.K.Y., E.K., F.T.E.

Acknowledgement: We thank the patient and his family for their helpful participation in this work.

Conflict of Interest: The authors have no conflicts of interest to declare.

Financial Disclosure: The authors declared that this study has received no financial support.

References

1. Parvaneh N, Quartier P, Rostami P, et al. Inborn errors of metabolism underlying primary immunodeficiencies. J Clin Immunol 2014; 34:753-71. [Crossref]
2. Leoni C, Giorgio V, Onesimo R, et al. The dark side of COVID-19: The need of integrated medicine for children with special care needs. Am J Med Genet A 2020; 182: 1988-9. [Crossref]
3. Zimran A, Hollak CE, Abrahamov A, et al. Home treatment with intravenous enzyme replacement therapy for Gaucher disease: An international collaborative study of 33 patients. Blood 1993; 82: 1107-9. [Crossref]
4. Caciotti A, Procopio E, Pochiero F, et al. SARS-CoV-2 infection in a patient with propionic acidemia. Orphanet J Rare Dis 2020; 15: 306. [Crossref]
5. Zimran A, Szer J, Revel-Vilk S. Impact of Gaucher disease on COVID-19. Intern Med J 2020; 50: 894-5. [Crossref]
6. Fierro L, Nesheiwat N, Narayanan P, et al. Gaucher disease and SARS-CoV-2 infection: Experience from 181 patients in New York. Mol Genet and Metab 2020; 132: 44-8. [Crossref]
7. Mistry P, Balwani M, Babouth D, et al. Gaucher disease and SARS-CoV-2 infection: Emerging management challenges. Mol Genet and Metab. 2020; 130(3): 164-169. [Crossref]
8. Elmonem MA, Belanger-Quintana A, Bordugo A, et al. The impact of COVID-19 pandemic on the diagnosis and management of inborn errors of metabolism: A global perspective. Mol Genet Metab 2020; 131: 285-88. [Crossref]
9. EURORDIS Rare Diseases Europe 2020. How has COVID-19 impacted people with rare diseases? Available from: https://download2.eurordis.org/rbv/covid19survey/covid_infographics_final.pdf
10. Campos MA, Azuara BE, Frutos LL, et al. Direct and indirect effects of the SARS-CoV-2 pandemic on Gaucher Disease patients in Spain: Time to reconsider home-based therapies? Blood Cells Mol Dis 2020; 85: 102478. [Crossref]