

# COVID-19 in a Child with Primary Specific Antibody Deficiency

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Hamid Ahanchian, Nasrin Moazzen, Majid Sezavar Dokht Faroughi, Negar Khalighi, Maryam Khoshkhui, Mohammad Hassan Aelami, Nasrin Sadat Motevalli Haghi, Nima Rezaei

**Hamid Ahanchian**

Allergy Research Center, Mashhad University of Medical Sciences, Mashhad, Iran

**Nasrin Moazzen**

Allergy Research Center, Mashhad University of Medical Sciences, Mashhad, Iran

✉ [moazzenn@mums.ac.ir](mailto:moazzenn@mums.ac.ir) **Corresponding Author**

**Majid Sezavar Dokht Faroughi**

Department of Pediatrics, Faculty of Medicine, Mashhad University of Medical Sciences, Mashhad, Iran

**Negar Khalighi**

Allergy Research Center, Mashhad University of Medical Sciences, Mashhad, Iran

**Maryam Khoshkhui**

Allergy Research Center, Mashhad University of Medical Sciences, Mashhad, Iran

**Mohammad Hassan Aelami**

Department of Pediatrics and Hand Hygiene and Infection Control Research Center, Imam Reza Hospital, Mashhad University of Medical Sciences, Mashhad, Iran

**Nasrin Sadat Motevalli Haghi**

Allergy Research Center, Mashhad University of Medical Sciences, Mashhad, Iran

**Nima Rezaei**

Research Center for Immunodeficiencies, Children's Medical Center, Tehran University of Medical Sciences, Tehran, Iran



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***Immunology Infectious Diseases***

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## Abstract

**Background.** In the recent coronavirus disease 2019 (COVID-19) pandemic, millions of people have been affected so far. Clinical manifestations and natural history of infections have a very wide range, which is important to know it in various underlying diseases. Although children are less affected than adults, its presentation especially in those with underlying diseases should not be neglected.

**Case presentation.** Herein we report the first case of specific antibody deficiency, who was affected with COVID-19. The patient suffered from rhinorrhea and modestly increased in productive cough, but real-time reverse transcription polymerase chain reaction was positive for COVID-19.

**Conclusions.** Although presentation of COVID-19 in patients with immunodeficiency could be mild, it should not be missed, while early diagnosis and appropriate treatment can survive affected patients.

## Background

New emerging viruses like coronavirus disease 2019 (COVID-19) causes huge concern for all [1], especially for immunocompromised people. This virus affects more than 3.3 million people worldwide during a 4-month period (until May 1<sup>st</sup>, 2020). Our immune system protects us against foreign invaders like different viruses, bacteria, fungus and everything other than us [2]. Primary immunodeficiency diseases (PIDs) are a heterogeneous group of disorders with about 400 distinct disorders, with different prevalence in different countries. In Iran, there are more than 3000 diagnosed patients with PIDs, where primary antibody deficiency consists of the majority with about one third of the cases [3].

Previously published papers mainly reported the epidemiological and clinical characteristics of COVID-19, also known as Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2). Herein we present an Iranian case of specific antibody deficiency with unusual manifestation of COVID-19 for the first time.

## Case Presentation

An eight-year old boy, who diagnosed as specific antibody deficiency based on frequent lung infection since infancy with multi-lobar bronchiectasis (Figure 1), normal sweat test, normal immunoglobulin level, but low specific antibodies responses. His symptoms and lung infections were significantly reduced after immunoglobulin replacement therapy. Nebulized amikacin and Ventolin administered at home.

After one year regular treatment, we visited him as routine monthly follow-up in an Outpatient Immunodeficiency Clinic in April 24, 2020.

He complained from mild clear rhinorrhea and modestly increased in productive cough, starting from a few days ago. No fever or other symptoms were found. In physical examination, fine crackles were heard at base of both lungs with right middle lobe prominence. He had tachypnea and mild suprasternal retraction (Figure 2). According to clinical, para clinical and positive real-time reverse transcription polymerase chain reaction (rRT - PCR) for COVID-19, treatment with meropenem, clindamycin, and hydroxychloroquine was started. After 7 days of hospitalization, his condition was improved and the patient was discharged with good condition.

## Discussion

According to current concepts about SARS-CoV-2, this virus has milder course and better prognosis in children than adult [4]. To our best knowledge, there is no reported primary specific antibody deficiency with COVID-19.

The immune system is affected during COVID-19 [5]; meanwhile defects of the immune system could also susceptible individuals to viral infections, including COVID-19.

In the presented case with antibody defect, SARS-CoV-2 presented with wet cough and rhinorrhea, which both are unusual in children with normal immune system. This case emphasizes that health care workers should not miss COVID-19 in patients with PID, even if they present with rare symptoms of COVID-19.

## Conclusion

SARS-CoV-2 presentation in immunocompromised patients, including PIDs may be mild symptoms like common cold or only exacerbating of preexisting symptoms.

## Declaration

**Ethics approval and consent to participate.** The study was approved by the ethics committee of Tehran University of Medical Sciences, and written informed consent was taken from the patient's parents. Consent for publication was obtained from the patient

**Consent for publication.** All the authors approved submission of this paper to this journal.

**Availability of data and material.** Data of patient is available, if needed.

**Competing interests.** None

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**Authors' contributions.** All the authors were involved in recruiting data for the paper. Hamid Ahanchian, Nasrin Moazzen, and Nima Rezaei drafted the report. Amin Saeidinia, Seyed Hossein Joghatayi, Maryam Khoshkhui, Mohammad Hassan Aelami, and Nasrin Sadat Motevalli Haghi critically revised the manuscript. All the authors approved the final draft.

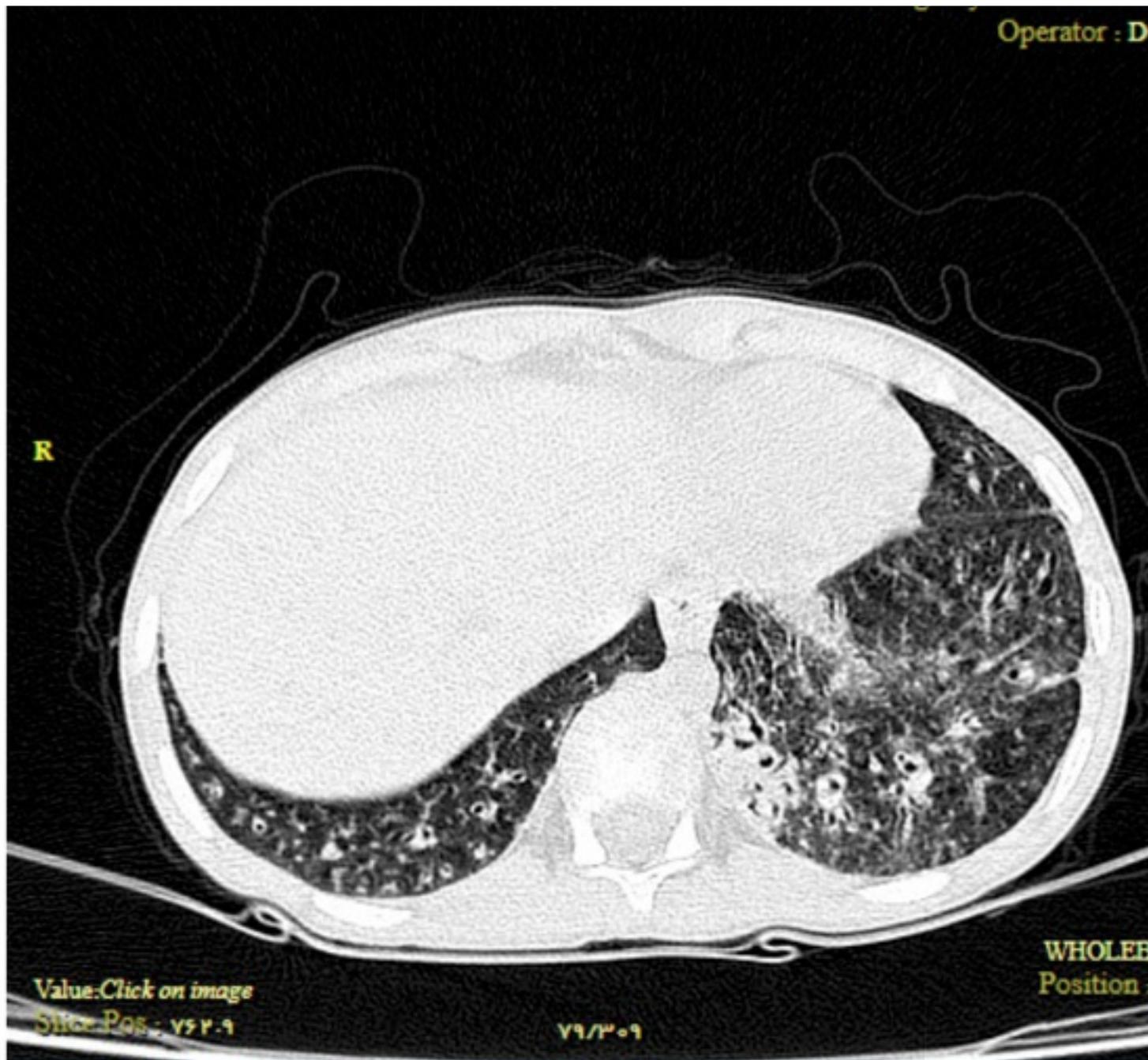
**Acknowledgements.** None

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## Figures

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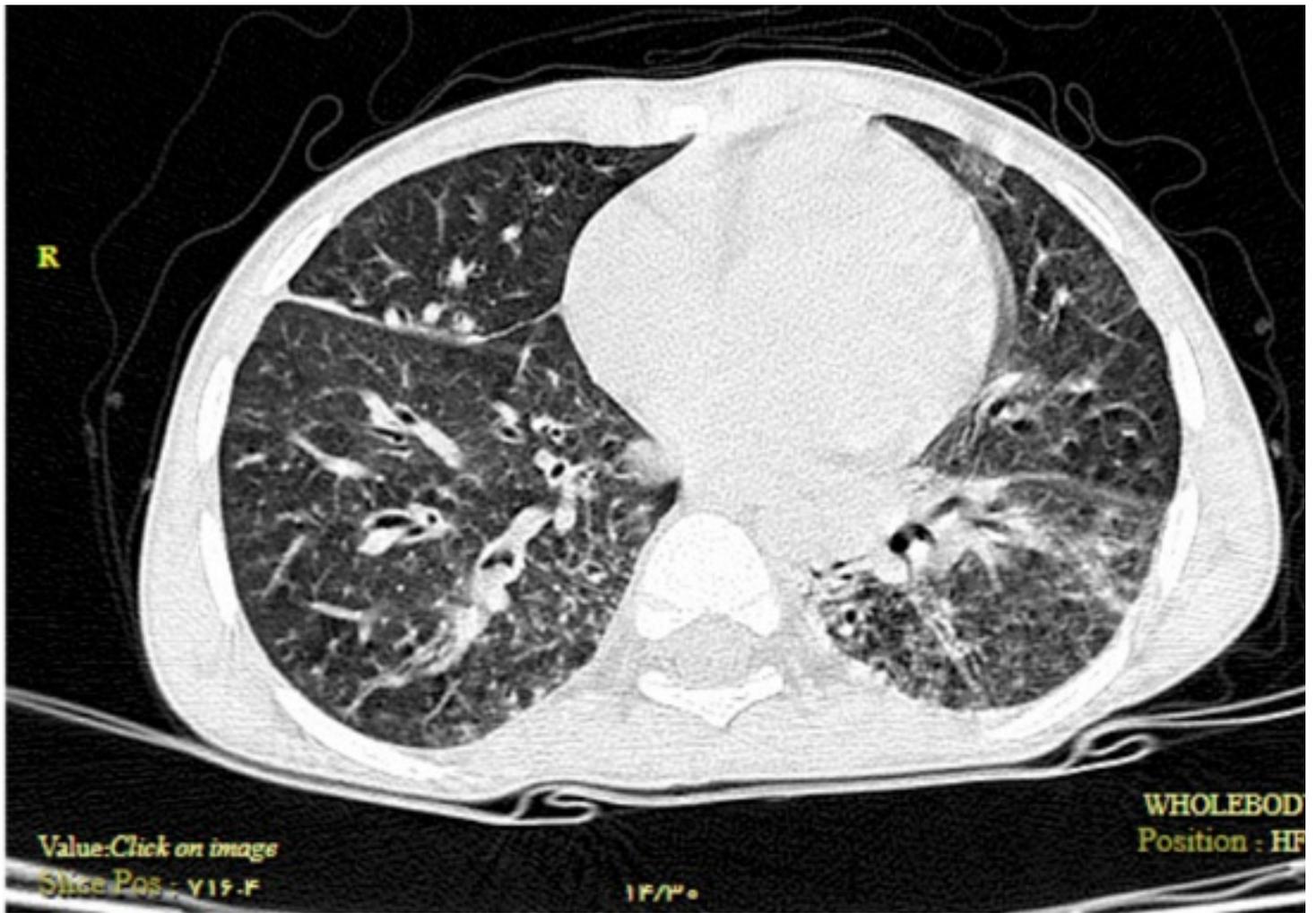


Figure 1

Computed tomography scan revealed evidence of bronchiectasis and collapse consolidations in an 8-year old boy with specific antibody deficiency.



**A**

Figure 2

X-ray of 8 years old boy with specific antibody deficiency. A. one year ago. B. recent admission.