

Atypical pneumonia diagnosed as coronavirus disease 2019 by a serologic test (patient –1 in Poland)

Jakub Swadźba^{1,2}, Danuta Kozłowska^{1,2}, Tomasz Anyszek^{1,2},
Małgorzata Dorycka², Emilia Martin², Anna Piotrowska-Mietelska²

¹ Faculty of Medicine and Health Sciences, Andrzej Frycz Modrzewski Krakow University, Kraków, Poland

² Medical Laboratory Diagnostyka, Kraków, Poland

A 63-year-old professionally active woman with hypertension and diabetes started displaying severe respiratory symptoms, including a high fever, weakness, and a cough on March 2, 2020. Throughout the following week, she had a fever higher than 39 °C, a dry cough, severe weakness, and gradually developed dyspnea. On March 8, 2020, the patient was admitted to the hospital due to confusion and severe dyspnea, resembling symptoms of septic shock. All bacteriological cultures were negative, and leukocytosis (close to upper range limit) as well as lymphopenia (11%) were observed. Procalcitonin concentration was moderately increased (0.4 ng/ml; normal range <0.1 ng/ml), but C-reactive protein was very high (277 mg/l, normal range <5 mg/l). All other tests directed at respiratory infections

were negative (influenza, respiratory syncytial virus, *Legionella pneumophila* and *Mycoplasma pneumoniae*, *Chlamydia pneumoniae*). A severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) test was not performed, probably because the pandemic had just started in Poland at that point, and prior to the symptoms, the patient had not been abroad. X-rays and computed tomography scans showed ground glass opacities and consolidations with peripheral distribution and multifocal / multilobar involvement in both lungs typical of coronavirus disease 2019 (COVID-19; [FIGURE 1A](#) and [1B](#)).¹ The patient's condition on oxygen and antibiotic treatment was improving slowly but steadily and no exacerbation was seen. The patient was discharged from the hospital on March 19,

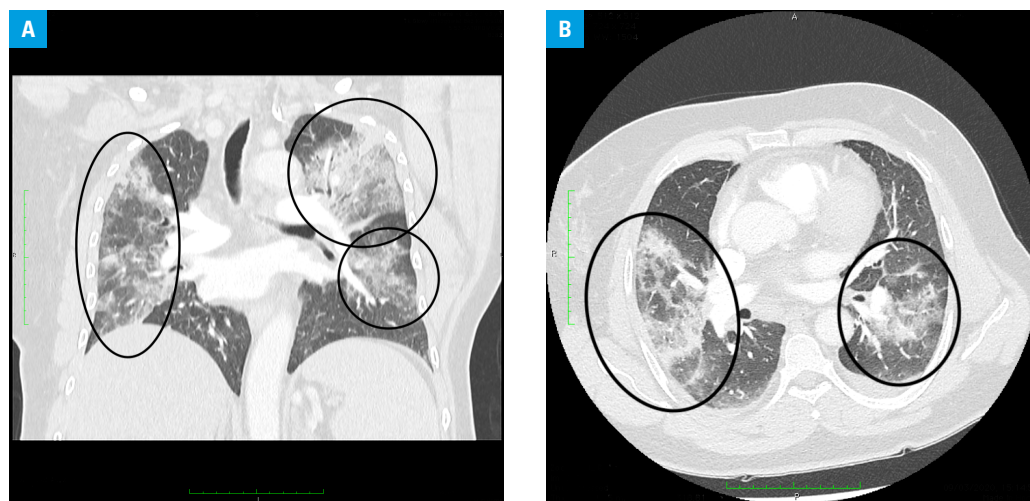


FIGURE 1 A, B – chest computed tomography: day 8 after the first clinical symptoms. Circled areas show ground glass opacities with peripheral distribution, consolidations with peripheral distribution, and multifocal/multilobar involvement.

Correspondence to:

Jakub Swadźba, PhD, Faculty of Medicine and Health Sciences, Andrzej Frycz Modrzewski Krakow University, Medical Laboratory Diagnostyka, ul. Prof. M. Życzkowskiego 16, 31-864 Kraków, Poland, phone: +48 12 295 01 51, email: jakub.swadzba@diag.pl

Received: April 7, 2020.

Revision accepted: April 16, 2020.

Published online: April 24, 2020.

Pol Arch Intern Med. 2020;

130 (5): 444-445

doi:10.20452/pamw.15313

Copyright by the Author(s), 2020

2020 having pneumonia of unknown etiology diagnosed.

One day later (March 20, 2020), due to the suspicion of SARS-CoV-2 unrecognized infection, the patient was referred for SARS-CoV-2 serology testing by immunochromatography (COVID-19 IgM/IgG Ab Test Cassette, Core Technology Co. Ltd., Beijing, China; sensitivity 94%, specificity 100%). The result was negative. However, the patient's symptoms persisted throughout the next week. The second immunochromatography test for SARS-CoV-2 antibodies was performed on March 27, 2020 and the result was positive in both IgM and IgG. The third test performed only day later on March 28, 2020 was also positive (pale IgM line). SARS-CoV-2 reverse transcriptase–polymerase chain reaction (RT-PCR) was performed on the naso-pharyngeal swab sample on March 29, 2020 and the result was positive, confirming a COVID-19 diagnosis after almost 4 weeks since the first symptoms.

At the hospital ward, where the patient was treated, some cases of COVID-19 among other patients and medical staff started to be reported 2 days after the patient had been discharged. The clinical symptoms demonstrated by the patient are compatible with COVID-19. It seems that this case could have been overlooked due to lack of specific epidemiologic data and the initial phase of epidemic in Poland (symptoms appeared 2 days before the first officially announced case—patient 0 travelling from Germany). This hypothesis could be backed up by negative tests for other known respiratory pathogens and computed tomography typical of COVID-19 (FIGURE 1A and B). It remains theoretically possible that the primary infection was of different etiology and then SARS-CoV-2 coinfection occurred. This could be supported by the negative-antibodies result on day 18 after the first symptoms, whereas, according to the published data, IgM antibodies should be present as early as between day 7 and day 14 after SARS-CoV-2 infection.^{2,3} The positive result of SARS-CoV-2 RT-PCR 28 days after the occurrence of first symptoms may be providing evidence for possible prolonged viremia in patients who have not reached full remission. The positive result of IgG in the second serologic test followed by a decreased intensity of the IgM line in the third testing indicates that the infection begun much earlier.

The case described in this report illustrates the challenges in establishing a proper diagnosis during a starting period of COVID-19 pandemic. The typical clinical and radiological symptoms of SARS-CoV-2 infection were first confirmed by a serological test, followed by RT-PCR. This case is an example of slow seroconversion (between day 19 and day 26 after first symptoms) and long lasting viremia (28 days). This is also evidence for the clinical utility of the so-called quick serology testing, as the positive results can lead to the retrospective diagnosis of COVID-19 and even to identification of patients with active COVID-19 who could potentially spread the disease.⁴

ARTICLE INFORMATION

CONFLICT OF INTEREST None declared.

OPEN ACCESS This is an Open Access article distributed under the terms of the Creative Commons Attribution-NonCommercial-ShareAlike 4.0 International License (CC BY-NC-SA 4.0), allowing third parties to copy and redistribute the material in any medium or format and to remix, transform, and build upon the material, provided the original work is properly cited, distributed under the same license, and used for noncommercial purposes only. For commercial use, please contact the journal office at pamw@mp.pl.

HOW TO CITE Swadźba J, Kozłowska D, Anyszek T, et al. Atypical pneumonia diagnosed as coronavirus disease 2019 by a serologic test (patient #1 in Poland). *Pol Arch Intern Med.* 2020; 130: 444-445. doi:10.20452/pamw.15313

REFERENCES

- 1 Sabri A, Taheri MS, Mahdavi A, Dobranowski J. 63-year-old male treated for COVID-19. *Pol Arch Intern Med.* 2020; 130: 324-325. [↗](#)
- 2 Xiao SY, Wu Y, Liu H. Evolving status of the 2019 novel coronavirus infection: proposal of conventional serologic assays for disease diagnosis and infection monitoring. *J Med Virol.* 2020; 92: 464-467. [↗](#)
- 3 Xiao AT, Gao C, Zhang S. Profile of specific antibodies to SARS-CoV-2: the first report. *J Infect.* 2020 Mar 21. [Epub ahead of print]. [↗](#)
- 4 Zhang W, Du RH, Li B, et al. Molecular and serological investigation of 2019-nCoV infected patients: implication of multiple shedding routes. *Emerg Microbes Infect.* 2020; 9: 386-389. [↗](#)