

in the COVID-19 Pregnancy and Infant Linked Outcomes Team (PILOT) (Elizabeth Lewis, Amanda Akosa, Nicki Roth, Christina Sancken, Megan Reynolds).

### About the Author

Dr. Griffin is a contracted epidemiologist with Eagle Global Scientific, LLC, in the National Center for Emerging and Zoonotic Infectious Diseases, Centers for Disease Control and Prevention, in Atlanta, Georgia, USA. Her primary research interest is emerging infectious diseases.

### References

1. Tang X, Musa SS, Zhao S, He D. Reinfection or reactivation of severe acute respiratory syndrome coronavirus 2: a systematic review. *Front Public Health*. 2021;9:663045. <https://doi.org/10.3389/fpubh.2021.663045>
2. Cevik M, Tate M, Lloyd O, Enrico Marao A, Schafers J, Ho A. SARS-CoV-2, SARS-CoV, and MERS-CoV viral load dynamics, and infectiousness: a systematic review and meta-analysis. *Lancet Microbe*. 2021;2:e13–22. [https://doi.org/10.1016/S2666-5247\(20\)30172-5](https://doi.org/10.1016/S2666-5247(20)30172-5)
3. Abu-Raddad LJ, Chemaitelly H, Coyle P, Malek JA, Ahmed AA, Mohamoud YA, et al. SARS-CoV-2 antibody-positivity protects against reinfection for at least seven months with 95% efficacy. *EClinicalMedicine*. 2021;35:100861. <https://doi.org/10.1016/j.eclinm.2021.100861>
4. Choi B, Choudhary MC, Regan J, Sparks JA, Padera RF, Qiu X, et al. Persistence and evolution of SARS-CoV-2 in an immunocompromised host. *N Engl J Med*. 2020;383:2291–3. <https://doi.org/10.1056/NEJMc2031364>
5. Centers for Disease Control and Prevention. Interim guidance on ending isolation and precautions for adults with COVID-19. 2021 Mar 16 [cited 2021 Jun 28]. <https://www.cdc.gov/coronavirus/2019-ncov/hcp/duration-isolation.html>
6. Rodríguez-Grande C, Alcalá L, Estévez A, Sola-Campoy PJ, Buenestado-Serrano S, Martínez-Laperche C, et al.; Gregorio Marañón Microbiology-ID COVID 19 Study Group. Systematic genomic and clinical analysis of severe acute respiratory syndrome coronavirus 2 reinfections and recurrences involving the same strain. *Emerg Infect Dis*. 2022;28:85–94. <https://doi.org/10.3201/eid2801.211952>
7. Donders F, Lonnée-Hoffmann R, Tsiakalos A, Mendling W, Martinez de Oliveira J, Judlin P, et al.; Isidog Covid-Guideline Workgroup. ISIDOG recommendations concerning COVID-19 and pregnancy. *Diagnostics (Basel)*. 2020;10:243. <https://doi.org/10.3390/diagnostics10040243>
8. Dubelbeiss E, Silverberg M, White C, Jaspan D, Goldberg J, Haines C. Repeat positive severe acute respiratory syndrome coronavirus 2 (coronavirus disease 2019) testing  $\geq 90$  days apart in pregnant women. *Am J Obstet Gynecol MFM*. 2021;3:100331. <https://doi.org/10.1016/j.ajogmf.2021.100331>
9. Woodworth KR, Reynolds MR, Burkel V, Gates C, Eckert V, McDermott C, et al. A preparedness model for mother-baby linked longitudinal surveillance for emerging threats. *Matern Child Health J*. 2021;25:198–206. <https://doi.org/10.1007/s10995-020-03106-y>

Address for correspondence: Kate R. Woodworth, Centers for Disease Control and Prevention, 4770 Buford Hwy NE, Mailstop S 106-3, Atlanta, GA 30341, USA; email: eoevent397@cdc.gov

## Hantavirus Pulmonary Syndrome in a COVID-19 Patient, Argentina, 2020

Rocío M. Coelho,<sup>1</sup> Natalia Periolo,<sup>1</sup> Carolina Perez Duhalde, Daniel O. Alonso, Carla M. Bellomo, Marisa Corazza, Ayelén A. Iglesias, Valeria P. Martinez

Author affiliations: Administración Nacional de Laboratorios e Institutos de Salud Dr. Carlos G. Malbrán, Buenos Aires, Argentina (R.M. Coelho, N. Periolo, D.O. Alonso, C.M. Bellomo, A.A. Iglesias, V.P. Martinez); Hospital Interzonal General de Agudos General de San Martín, Buenos Aires (C. Perez Duhalde); Instituto Biológico “Tomás Perón,” Buenos Aires (M. Corazza)

DOI: <https://doi.org/10.3201/eid2804.211837>

We describe a patient in Argentina with severe acute respiratory syndrome coronavirus 2 infection and hantavirus pulmonary syndrome (HPS). Although both coronavirus disease and HPS can be fatal when not diagnosed and treated promptly, HPS is much more lethal. This case report may contribute to improved detection of co-infections in HPS-endemic regions.

The current coronavirus disease (COVID-19) pandemic, caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), has resulted in substantial illness and death rates worldwide. Orthohantaviruses are zoonotic viruses responsible for another severe respiratory infectious disease in the Americas, hantavirus pulmonary syndrome (HPS). Although humans generally become infected with HPS through inhaling excreta generated by infected rodents, person-to-person transmission has been well documented in Argentina and Chile (1–3). Humans become infected with SARS-CoV-2 and orthohantaviruses in similar ways, through inhaling contaminated aerosols, and can have onset of similar respiratory syndromes. Despite these similarities, the incubation period is shorter in COVID-19 patients (2–14 days) than in HPS patients (7–45 days). Furthermore, at the time the case we describe was reported, the cumulative case-fatality rate for COVID-19 in Argentina was 2.7% (4); for HPS, it was 22%–40% (5).

HPS is characterized by the onset of symptoms such as fever, myalgia, cough, dyspnea, diarrhea, and sweating. Rapid progression to shock or respiratory distress can occur within hours. Symptom-based

<sup>1</sup>These authors contributed equally to this article.

therapy with oxygen and ventilatory or circulatory support is needed (6,7).

We describe a case of SARS-CoV-2 and Andes virus co-infection in central Argentina. The patient, a 22-year-old woman without relevant pathologic records, sought care at a local hospital in November 2020 for fever, headache, myalgia, and gastrointestinal manifestations. A nasopharyngeal swab sample tested positive for SARS-CoV-2 by reverse transcription PCR at the Instituto Biológico “Tomás Perón” (Appendix, <https://wwwnc.cdc.gov/EID/article/28/4/21-1837-App1.pdf>). Five days after the onset of fever, the patient’s clinical status worsened, and she was admitted to the hospital. Clinical laboratory findings at admission indicated thrombocytopenia, high leukocyte count, lymphopenia, and elevated hepatic enzymes (Appendix). Computed tomography revealed bilateral pleural effusion associated with interstitial infiltration, and capillary filtration with slight peripheral pulmonary ground-glass opacity (Figure).

Within a few hours after admission, the patient had onset of marked respiratory distress. She was then referred to the intensive care unit for orotracheal intubation and treated with ampicillin/sulbactam and azithromycin. The epidemiologic investigation established that the patient resided in a hantavirus-endemic area. Consequently, HPS was suspected, despite the COVID-19–positive diagnosis. According to the confirmation criteria used by the Hantavirus National Reference Laboratory (8), Andes virus infection was confirmed by the detection of specific IgM and IgG by ELISA and genomic viral RNA by quantitative reverse transcription PCR in blood (Appendix).

Three days after the co-infection was confirmed, the patient was extubated and progressed favorably. Twenty days after onset of symptoms, she was discharged from the hospital.

To determine the viral genotype of Andes virus, we conducted a nucleotide sequence analysis from 2 partial fragments of viral small (496-bp) and medium (611-bp) segments, and we submitted the sequences obtained to GenBank (accession nos. OL840325 and OL840326). The highest nucleotide identities matched previous published sequences corresponding to Plata genotype of Andes virus (GenBank accession nos. EU564720 [96% identity] and AY101185 [97.8 identity]). This viral genotype is one of the prevalent pathogenic orthohantaviruses circulating in central Argentina and Uruguay (9).

Because the incubation period for HPS is longer than that for COVID-19, we might speculate that



**Figure.** Computed tomography scan results on the second day of hospitalization (day 7 after fever onset) for a patient with severe acute respiratory syndrome coronavirus 2 and hantavirus co-infection, Argentina, 2020, showing pleural effusion, interstitial compromise, vascular congestion, and glass-ground opacities.

hantavirus infection occurred before coronavirus infection. The respiratory distress syndrome appeared 5 days after the onset of fever, which coincided with the characteristic prodromal period described for HPS. This condition, during the incubation period of HPS, could have induced a higher susceptibility to COVID-19. Because HPS can evolve rapidly to respiratory failure in most patients with severe disease, resulting in high case-fatality rates, alerting health-care workers from HPS-endemic areas is warranted to detect co-infections in the context of the COVID-19 pandemic. In particular, at least 2 genotypes of Andes virus can be transmitted person-to-person, and these species are prevalent in 2 of the 3 hantavirus-endemic regions of Argentina (10).

In conclusion, we detected co-infection with SARS-CoV-2 and Andes virus causing HPS in a patient from a hantavirus-endemic area. Clinicians should be aware of the possibility of co-infection for patients originating, residing, or traveling in hantavirus-endemic areas.

## About the Author

Miss Coelho works in the Virology Department, Instituto Malbran, Buenos Aires, Argentina. Her primary research interests include epidemiology of infectious diseases and the diagnosis of respiratory viruses. Dr. Periolo works in the Virology Department, Instituto Malbran, Buenos Aires, Argentina. Her primary research interests include the virology of infectious diseases, immunology, and infectious respiratory diseases.

## References

1. Alonso DO, Pérez-Sautu U, Bellomo CM, Prieto K, Iglesias A, Coelho R, et al. Person-to-person transmission of Andes virus in hantavirus pulmonary syndrome, Argentina, 2014. *Emerg Infect Dis.* 2020;26:756–9. <https://doi.org/10.3201/eid2604.190799>
2. Martínez VP, Di Paola N, Alonso DO, Pérez-Sautu U, Bellomo CM, Iglesias AA, et al. “Super-spreaders” and person-to-person transmission of Andes virus in Argentina. *N Engl J Med.* 2020;383:2230–41. <https://doi.org/10.1056/NEJMoa2009040>
3. Riquelme R, Rioseco ML, Bastidas L, Trincado D, Riquelme M, Loyola H, et al. Hantavirus pulmonary syndrome, southern Chile, 1995–2012. *Emerg Infect Dis.* 2015;21:562–8. <https://doi.org/10.3201/eid2104.141437>
4. Ministerio de Salud Argentina. Boletín integrado de vigilancia N525 SE49, 11/01/2021 [cited 2021 Jan 21]. [https://bancos.salud.gob.ar/sites/default/files/2021-01/biv\\_525\\_se49.pdf](https://bancos.salud.gob.ar/sites/default/files/2021-01/biv_525_se49.pdf)
5. Martínez VP, Bellomo CM, Cacace ML, Suárez P, Bogni L, Padula PJ. Hantavirus pulmonary syndrome in Argentina, 1995–2008. *Emerg Infect Dis.* 2010;16:1853–60. <https://doi.org/10.3201/eid1612.091170>
6. MacNeil A, Ksiazek TG, Rollin PE. Hantavirus pulmonary syndrome, United States, 1993–2009. *Emerg Infect Dis.* 2011;17:1195–201. <https://doi.org/10.3201/eid1707.101306>
7. Jonsson CB, Hooper J, Mertz G. Treatment of hantavirus pulmonary syndrome. *Antiviral Res.* 2008;78:162–9. <https://doi.org/10.1016/j.antiviral.2007.10.012>
8. Alonso DO, Iglesias A, Coelho R, Periolo N, Bruno A, Córdoba MT, et al. Epidemiological description, case-fatality rate, and trends of hantavirus pulmonary syndrome: 9 years of surveillance in Argentina. *J Med Virol.* 2019;91:1173–81. <https://doi.org/10.1002/jmv.25446>
9. Padula PJ, Colavecchia SB, Martínez VP, Gonzalez Della Valle MO, Edelstein A, Miguel SD, et al. Genetic diversity, distribution, and serological features of hantavirus infection in five countries in South America. *J Clin Microbiol.* 2000;38:3029–35. <https://doi.org/10.1128/JCM.38.8.3029-3035.2000>
10. Martínez VP, Bellomo C, San Juan J, Pinna D, Forlenza R, Elder M, et al. Person-to-person transmission of Andes virus. *Emerg Infect Dis.* 2005;11:1848–53. <https://doi.org/10.3201/eid1112.050501>

Address for correspondence: Natalia Periolo, Instituto Nacional de Enfermedades Infecciosas, Administración Nacional de Laboratorios e Institutos de Salud, Av Velez Sarsfield 563, C1282 AFF, CABA, Argentina; email: nperiolo@anlis.gob.ar

## Early Circulation of SARS-CoV-2, Congo, 2020

Novy Charel Bobouaka Bonguili,<sup>1</sup> Matthieu Fritz,<sup>1</sup> Leadisabelle Hosanna Lenguiya, Pembe Issamou Mayengue, Félix Koukouikila-Koussounda, Louis Régis Dossou-Yovo, Cynthia Nkoua Badzi, Eric M. Leroy, Fabien R. Niama

Author affiliations: Laboratoire National de Santé Publique, Brazzaville, Republic of Congo (N.C. Bobouaka Bonguili, H. Lenguiya, P. Issamou Mayengue, F. Koukouikila-Koussounda, L.R. Dossou-Yovo, C. Nkoua Badzi, F.R. Niama), Université Marien Ngouabi, Brazzaville (N.C. Bobouaka Bonguili, H. Lenguiya, P. Issamou Mayengue, F. Koukouikila-Koussounda, L.R. Dossou-Yovo, F.R. Niama), Université de Montpellier, Montpellier, France (M. Fritz, E.M. Leroy); Institut de Recherche pour le Développement, Unité Mixte de Recherche MIVEGEC, Montpellier (M. Fritz, E.M. Leroy)

DOI: <https://doi.org/10.3201/eid2804.212476>

To determine when severe acute respiratory syndrome coronavirus 2 arrived in Congo, we retrospectively antibody tested 937 blood samples collected during September 2019–February 2020. Seropositivity significantly increased from 1% in December 2019 to 5.3% in February 2020, before the first officially reported case in March 2020, suggesting unexpected early virus circulation.

After coronavirus disease (COVID-19) was reported in China in December 2019, severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) rapidly spread around the world; most countries officially reported their first cases within the first 3 months of 2020. However, reports from China show a possible earlier first case on November 17, 2019, detected retrospectively in Hubei Province (1). Furthermore, phylogenetic analysis places the date of emergence as sometime during October–December 2019 (2). These data suggest possible virus spread outside China before the first officially reported case in December 2019. Indeed, several retrospective studies that analyzed stored respiratory samples and wastewater for RNA detection, as well as serologic studies, suggest that SARS-CoV-2 may have been circulating in France, Spain, and Italy (3–7) before December 2019, months before the first official cases were reported.

In central Africa, the first cases were officially reported during March 6–April 6, 2020; in Congo, the first case was reported on March 14, 2020. However, a

<sup>1</sup>These first authors contributed equally to this article.

# Hantavirus Pulmonary Syndrome in a COVID-19 Patient, Argentina, 2020

## Appendix

**Appendix Table.** Clinical and virologic laboratory findings\*

Characteristic	Reference value	Days after onset of symptoms										
		3	5	6	7	9	10	12	13	14	16	18
Platelet count, cell/mm <sup>3</sup>	154–383	ND	55	50	73	100	136	ND	200	ND	332	ND
Hemoglobin, g/dL	11.8–15.5	ND	18.3	16.9	13	8.5	9.6	ND	8.2	ND	8.6	ND
Total leukocytes, 10 <sup>3</sup> μL	4.1–9.8	ND	17.2	12.8	12.3	ND	10.8	ND	12.3	ND	ND	ND
Monocytes, %	5.1–10.1	ND	ND	2	ND	ND	14.3	ND	14	ND	ND	ND
Lymphocyte, %	19.4–44.1	ND	ND	9	ND	ND	23.3	ND	24	ND	ND	ND
Neutrophils, %	41–73.1	ND	ND	58	ND	ND	56.1	ND	60	ND	ND	ND
NLR, %	1–3†	ND	ND	6.4	ND	ND	2.4	ND	2.5	ND	ND	ND
AST, UI/L	0–32	ND	ND	107	70	95	90	68	ND	46	ND	ND
ALT, UI/L	0–31	ND	ND	38	28	56	63	79	ND	58	ND	ND
SARS CoV-2												
RT-PCR gene ORF 1 AB	C <sub>t</sub> >38	34.07	ND	ND	ND	ND	35.02	ND	ND	ND	ND	Negative
RT-PCR gene N	C <sub>t</sub> >38	29.92	ND	ND	ND	ND	32.05	ND	ND	ND	ND	Negative
Hantavirus												
ELISA IgM	Cut off 0.3	ND	ND	ND	ND	ND	1.64	ND	ND	ND	ND	2.80
ELISA IgG	Cut off 0.55	ND	ND	ND	ND	ND	2.8	ND	ND	ND	ND	3.39
RT-PCR	C <sub>t</sub> >38	ND	ND	ND	ND	ND	24.4	ND	ND	ND	ND	ND

\*ALT alanine aminotransferase; AST, aspartate aminotransferase, C<sub>t</sub>, cycle threshold; ND, not done; RT-PCR, reverse transcription PCR, SARS-CoV-2, severe acute respiratory syndrome coronavirus 2.  
†PulmCrit.