About the Author

Dr. Burqi is a consultant intensive care specialist working in the intensive care unit at PNS Shifa hospital in Karachi, Pakistan.

References:

1. Gharpure R, Bliton J, Goodman A, Ali IKM, Yoder J, Cope JR. Epidemiology and clinical characteristics of primary amebic meningoencephalitis caused by *Naegleria fowleri*: a global review. Clin Infect Dis. 2021;73:e19–27. https://doi.org/10.1093/cid/ciaa520
2. Centers for Disease Control and Prevention. *Naegleria fowleri*—primary amebic meningoencephalitis (PAM)—amebic encephalitis. Information for public health and medical professionals [cited 2023 May 3]. https://www.cdc.gov/parasites/naegleria/health_professionals.html
3. Ali M, Jamal SB, Farhat SM. *Naegleria fowleri* in Pakistan. Lancet Infect Dis. 2020;20:27–8. https://doi.org/10.1016/S1473-3099(19)30675-9
4. Ghanchi NK, Khan E, Khan A, Muhammad W, Malik FR, Zafar A. *Naegleria fowleri* meningoencephalitis associated with public water supply, Pakistan, 2014. Emerg Infect Dis. 2016;22:1835–7. https://doi.org/10.3201/eid2210.151236
5. Anderson K, Jamieson A. Primary amoebic meningoencephalitis. Lancet. 1972;2:379. https://doi.org/10.1016/S0140-6736(72)91763-1
6. Seidel JS, Harmatz P, Visvesvara GS. Successful treatment of PAM. N Engl J Med. 1982;306:346–8. https://doi.org/10.1056/NEJM198202113060607
7. Vargas-Zepeda J, Gómez-Alcalá AV, Vásquez-Morales JA, Licea-Amaya L, De Jonckheere JF, Lares-Villa F. Successful treatment of *Naegleria fowleri* meningoencephalitis by using intravenous amphotericin B, fluconazole and rifampicin. Arch Med Res. 2005;36:83–6. https://doi.org/10.1016/j.arcmed.2004.11.003
8. Linam WM, Ahmed M, Cope JR, Chu C, Visvesvara GS, da Silva AJ, et al. Successful treatment of an adolescent with *Naegleria fowleri* primary amebic meningoencephalitis. Pediatrics. 2015;135:e744–8. https://doi.org/10.1542/peds.2014-2292
9. Cope JR, Conrad DA, Cohen N, Cotilla M, DaSilva A, Jackson J, et al. Use of the novel therapeutic agent miltefosine for the treatment of primary amebic meningoencephalitis: report of 1 fatal and 1 surviving case. Clin Infect Dis. 2016;62:774–6. https://doi.org/10.1093/cid/civ1021
10. Ghanchi NK, Jamil B, Khan E, Ansar Z, Samreen A, Zafar A, et al. Case series of *Naegleria fowleri* primary ameobic meningoencephalitis from Karachi, Pakistan. Am J Trop Med Hyg. 2017;97:1600–2. https://doi.org/10.4269/ajtmh.17-0110

Address for correspondence: Luqman Satti, Department of Medical Microbiology, Clinical Pathology Laboratory. National University of Medical Sciences Rawalpindi, Pakistan; email: luqmansatti@hotmail.com

Case Management of Imported Crimean–Congo Hemorrhagic Fever, Senegal, July 2023

Youssou Bamar Gueye, Yoro Sall, Jerlie Loko Roka, Ibra Diagne, Kalidou Djibril Sow, Alseyni Diallo, Pape Samba Dièye, Jean Pierre Diallo, Boly Diop, Omer Pasi

Author affiliations: Ministry of Health and Social Action, Dakar, Senegal (Y.B. Gueye, Y. Sall, I. Diagne, K.D. Sow, A. Diallo, P.S. Dièye, J.P. Diallo, B. Diop); Centers for Disease Control and Prevention, Atlanta, Georgia, USA (J. Loko Roka, O. Pasi)

We report an imported Crimean-Congo hemorrhagic fever case in Senegal. The patient received PCR confirmation of virus infection 10 days after symptom onset. We identified 46 patient contacts in Senegal; 87.7% were healthcare professionals. Strengthening border crossing and community surveillance systems can help reduce the risks of infectious disease transmission.

Crimean-Congo hemorrhagic fever (CCHF), a severe form of hemorrhagic fever primarily transmitted to humans and animals through tick bites, is caused by CCHF virus (CCHFV). In addition, direct human contact with blood or infected tissues from viremic animals and contact with blood or secretions of an infected person have been described as transmission routes (1,2). In Senegal, the circulation of CCHFV has been reported in humans, livestock, and ticks in different areas of the country (3,4). During March–September 2023, Senegal declared a CCHF outbreak that had 8 cases distributed across 5 regions of the country (5). During July 2023, CCHF was diagnosed in a Senegal hospital for the 4th patient, who resided in another country. We report on the management of this imported CCHF case in Senegal.

The patient was a man in his 50s who was a trader residing in the capital of a country neighboring Senegal. He might have come into close contact with animals through his work or at home. He experienced fever, headache, and abdominal pain 2 days after returning to his rural home on July 16, 2023. The symptoms led to a consultation at a private healthcare facility in his home country, where treatment was initiated without improvement. The persistence of clinical symptoms prompted a consultation at a referral hospital in his country of residence, after which the patient's health further deteriorated 2 days later.

He had petechiae, and an abdominal ultrasound revealed hepatopathy, which prompted a family decision to seek better care in Senegal.

In Senegal, a fibroscopy and biologic tests were conducted, and results showed severe thrombocytopenia at 2,000 platelets/μL (reference range 150,000–450,000/μL). The patient was transferred to a healthcare facility that managed severe clinical cases. Because of a worsening clinical condition, including hyperglycemia and hematemesis, the patient was then transferred to the National Hospital of Pikine, Dakar, and admitted to the intensive care unit. On the 3rd day of intensive care hospitalization, the health district team collected blood samples for biologic analysis. PCR testing was positive for CCHFV 10 days after disease onset, but the patient died from multiorgan failure on the same day that PCR results were obtained.

During the case study, the investigation team identified 38 contacts in the patient's home country; 46 contacts were identified in Senegal, most (87.7%) healthcare personnel, including doctors, nurses, and laboratory staff. No bloodborne pathogen exposure incidents were reported during patient care or while handling the patient's samples. However, the level of infection prevention and control (IPC) was relatively low. We assessed the IPC level by using a structured assessment that had questions regarding the availability and usage of personal protective equipment, material sterilization, waste management, and the healthcare personnel's IPC training.

We observed a delay in diagnosis for this patient despite seeking medical attention at the onset of symptoms. The time between the onset of symptoms and diagnosis was 10 days. In India, a study involving 4 CCHF cases reported an average delay of 5.75 days from symptom onset to diagnosis (6). However, in northern Senegal, a CCHF case was diagnosed within 3 days of symptom onset because the 4S surveillance network, a Senegal surveillance sentinel sites system (4), was deployed. The 4S surveillance system encompasses 25 sentinel sites distributed across the country; >1 site exists in each of the country's 14 regions.

Healthcare personnel accounted for 87.7% of this patient's contacts in Senegal. According to reports in the literature, healthcare professionals are one of the socioprofessional categories most affected by secondary CCHF infection (7,8). One study showed that 49% of laboratory-confirmed secondary CCHF cases were among healthcare personnel; needlestick injuries were the primary mode of exposure in 62.7% of those cases (8). In addition, that study identified 21 CCHF cases associated with travel (8). The case we report indicates that countries should adhere to Annex 1 of the World Health Organization's International Health Regulations that defines the core capacity requirements for detecting ill travelers (9). During management of this CCHF case, we found no documented incidents of blood exposure, and no secondary CCHF cases were reported at the end of the 14-day contact follow-up, despite the relatively low IPC level.

In conclusion, we believe the delay in diagnosing this CCHF case resulted from the patient seeking care at multiple healthcare facilities. The healthcare personnel exposure that we identified highlights the necessity of systematically adhering to standard IPC precautions. Establishing a system for detecting potential epidemic diseases at border crossings, coupled with strengthening community surveillance, can help reduce the risks of infectious disease transmission.

About the Author
Dr. Gueye is the operation unit chief at the Senegal National Emergency Operation Center within the Ministry of Health and Social Action. His research interests focus on viral infectious diseases transmissible by blood, sickle cell disease, and hemophilia.

References

1. Abudurexiti A, Adkins S, Alioto D, Alkhovsky SV, Avšič-Županc T, Ballinger MJ, et al. Taxonomy of the order Bunyavirales: update 2019. Arch Virol. 2019;164:1949–65. https://doi.org/10.1007/s00705-019-04253-6
2. Hawman DW, Feldmann H. Crimean-Congo haemorrhagic fever virus. Nat Rev Microbiol. 2023;21:463–77. https://doi.org/10.1038/s41579-023-00871-9
3. Mhamadi M, Badji A, Dieng I, Gaye A, Ndiaye EH, Ndiaye M, et al. Crimean-Congo hemorrhagic fever virus survey in humans, ticks, and livestock in Agnam (northeastern Senegal) from February 2021 to March 2022. Trop Med Infect Dis. 2022;7:324. https://doi.org/10.3390/tropicalmed7100324
4. Dieng I, Barry MA, Diagne MM, Diop B, Ndiaye M, Faye M, et al. Detection of Crimean Congo haemorrhagic fever virus in north-eastern Senegal, Bokidiawé 2019. Emerg Microbes Infect. 2020;9:2485–7. https://doi.org/10.1080/22221751.2020.1847605
5. World Health Organization African Region. Weekly bulletin on outbreaks and other emergencies, week 42, October 16–22, 2023 [cited 2024 Feb 15]. https://iris.who.int/bitstream/handle/10665/373912/OEW42-1622102023.pdf
6. Tripathi S, Bhati R, Gopalakrishnan M, Bohra GK, Tiwari S, Panda S, et al. Clinical profile and outcome of patients with Crimean Congo haemorrhagic fever: a hospital based observational study from Rajasthan, India. Trans R Soc Trop Med Hyg. 2020;114:643–9. https://doi.org/10.1093/trstmh/traa014

7. Maltezou HC, Papa A, Ventouri S, Tseki C, Pervanidou D, Pavli A, et al. A case of Crimean-Congo haemorrhagic fever imported in Greece: contact tracing and management of exposed healthcare workers. J Infect Prev. 2019;20:171–8. https://doi.org/10.1177/1757177419852666

8. Leblebicioglu H, Sunbul M, Guner R, Bodur H, Bulut C, Duygu F, et al. Healthcare-associated Crimean-Congo haemorrhagic fever in Turkey, 2002–2014: a multicentre retrospective cross-sectional study. Clin Microbiol Infect. 2016;22:387.e1–4. https://doi.org/10.1016/j.cmi.2015.11.024

9. World Health Organization. International health regulations (2005), 3rd edition [cited 2023 Aug 24]. https://www.who.int/publications/i/item/9789241580496

Address for correspondence: Jerlie Loko Roka, Centers for Disease Control and Prevention, Senegal office, B.P. 49, Rte des Almadies, Dakar, Senegal; email: myu3@cdc.gov

Potential Sexual Transmission of Antifungal-Resistant *Trichophyton indotineae*

Stephanie Spivack, Jeremy A.W. Gold, Shawn R. Lockhart, Priyanka Anand, Laura A.S. Quilter, Dallas J. Smith, Briana Bowen, Jane M. Gould, Ahmed Eltokhy, Ahmed Gamal, Mauricio Retuerto, Thomas S. McCormick, Mahmoud A. Ghannoum

Author affiliations: Temple University Hospital Section of Infectious Diseases, Philadelphia, Pennsylvania, USA (S. Spivack); Centers for Disease Control and Prevention, Atlanta, Georgia, USA (J.A.W. Gold, S.R. Lockhart, P. Anand, L.A.S. Quilter, D.J. Smith); Department of Public Health, Philadelphia (B. Bowen, J.M. Gould); Center for Medical Mycology, Case Western Reserve University and University Hospitals Cleveland Medical Center, Cleveland, Ohio, USA (A. Eltokhy, A. Gamal, M. Retuerto, T.S. McCormick, M.A. Ghannoum)

We describe a case of tinea genitalis in an immunocompetent woman in Pennsylvania, USA. Infection was caused by *Trichophyton indotineae* potentially acquired through sexual contact. The fungus was resistant to terbinafine (first-line antifungal) but improved with itraconazole. Clinicians should be aware of *T. indotineae* as a potential cause of antifungal-resistant genital lesions.

Dermatophytosis, also called ringworm or tinea, is a common superficial fungal skin infection most often caused by *Trichophyton*, *Microsporum*, or *Epidermophyton* fungi and often treated using over-the-counter topical antifungal agents (*1*). Oral terbinafine is a first-line antifungal treatment for extensive skin infections, which typically occur in immunocompromised or older persons (*1*). Outbreaks of extensive, recalcitrant, and frequently terbinafine-resistant dermatophytosis in immunocompetent persons are ongoing in southern Asia because of the recently emerged dermatophyte *Trichophyton indotineae* (formerly *Trichophyton mentagrophytes* genotype VIII). *T. indotineae* typically causes tinea faciei, corporis, or cruris; easily spreads person-to-person; and has been reported globally, including in multiple US states (*2*–*4*). Laboratory identification requires advanced molecular techniques because culture-based methods cannot distinguish *T. indotineae* from other *Trichophyton* species (*2*).

Previous reports describe sexual transmission of genital dermatophytosis (*5*,*6*), including cases caused by *T. mentagrophytes* genotype VII, a dermatophyte closely related to *T. indotineae* but not associated with terbinafine resistance (*7*,*8*). We report a case of tinea genitalis in an immunocompetent woman in Pennsylvania, USA, that was caused by an antifungal-resistant *T. indotineae* strain potentially acquired through sexual contact. Our study was reviewed by the Centers for Disease Control and Prevention (CDC) and conducted consistent with applicable federal laws and CDC policy.

During winter 2022, a healthy young cisgender woman traveled to South Asia. While there, she had vaginal intercourse with a man who had purple genital and buttocks lesions. Subsequently, she experienced similar lesions, beginning on her inner thigh, then spreading to her genitals and buttocks. In spring 2022, she returned to the United States and sought care from a primary care provider and dermatologist. She received mometasone 0.1% ointment (topical medium-potency corticosteroid) for suspected contact dermatitis, econazole 1% (topical antifungal) cream, a prednisone taper pack, and diphenhydramine. The reported lesions did not resolve, and corticosteroids worsened the condition. The result of a thigh skin-punch biopsy was positive for hyphae by periodic acid-Schiff stain, consistent with dermatophytosis. The patient subsequently received multiple antifungal courses including topical ketoconazole, oral terbinafine (250 mg/d for 2 weeks), and fluconazole (150 mg/wk to 200 mg/d for >20 cumulative weeks), all without lesion resolution.