creased awareness in the healthcare community.

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References

1. Hoogstraal H. The epidemiology of tick-borne Crimean-Congo hemorrhagic fever in Asia, Europe, and Africa. J Med Entomol. 1979;15:307–417.
2. Ergonul O. Crimean-Congo haemorrhagic fever. Lancet Infect Dis. 2006;6:203–14. DOI: 10.1016/S1473-3099(06)70435-2
3. Rodriguez LL, Maupin GO, Ksiazek TG, Rollin PE, Khan AS, Schwarz TF, et al. Molecular investigation of a multisource outbreak of Crimean-Congo hemorrhagic fever in the United Arab Emirates. Am J Trop Med Hyg. 1997;57:512.
4. Burney MI, Ghafoor A, Saleen M, Webb PA, Casals J. Nosocomial outbreak of viral hemorrhagic fever caused by Crimean hemorrhagic fever-Congo virus in Pakistan, January 1976. Am J Trop Med Hyg. 1980;29:941–7.
5. Van Eeden PJ, Joubert JR, van de Wal BW, King JB, de Kock A, Groenewald JH. A nosocomial outbreak of Crimean-Congo haemorrhagic fever at Tygerberg Hospital. I. Clinical features. S Afr Med J. 1985;68:711–7.
6. Goldfarb LG, Chumakov MP, Myskin AA, Kondratenko VF, Reznikov OY. An epidemiological model of Crimean hemorrhagic fever. Am J Trop Med Hyg. 1980;29:260–4.
7. Aradaib IE, Erickson BR, Mustafa ME, Khristova ML, Saeed NS, Elageb RM, et al. Nosocomial outbreak of Crimean-Congo hemorrhagic fever, Sudan. Emerg Infect Dis. 2010;16:837–9.
8. Ergonul O, Celikbas A, Dokuzoguz B, Eren S, Baykam N, Esener H. Characteristics of patients with Crimean-Congo hemorrhagic fever in a recent outbreak in Turkey and the impact of oral ribavirin therapy. Clin Infect Dis. 2004;39:284–7. DOI: 10.1086/422000

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Mycobacterium avium subsp. *hominissuis* Infection in Horses

To the Editor: *Mycobacterium avium* subsp. *hominissuis* infection is often detected in pigs and humans (*1*–*3*). In most cases, the main sources of this agent are environmental (*4*,*5*). During the past few years, 2 hosts infected by this agent, dogs (*6*) and pet parrots (*7*), were identified as a possible source of infection for immunocompromised humans who may have close contact with animals. We report massive *M. avium* subsp. *hominissuis* infection in 2 sibling riding-type Fjord horses from an amateur-run horse-breeding farm.

The first horse, a 2-year-old colt, was admitted to a veterinary clinic in the Czech Republic in February 2009 with diarrhea and progressive weight loss of 3 weeks' duration. Multiple diagnostic procedures produced inconclusive results. Cyathostomosis was suspected, so moxidectin was administered twice, and prednisolone was given for 10 consecutive days. The clinical status of the horse initially improved but worsened after 3 weeks. Ultrasonographic examination of the peritoneal cavity showed a nodular mass and a nonperistaltic, thickened portion of the small intestine wall in the left ventrocranial region. Exploratory celiotomy showed enlargement of the mesenteric and colonic lymph nodes and multiple local thickenings of the small intestine wall, large colon, and cecum. The horse was euthanized. Specimens of enlarged lymph nodes and intestinal content were taken during necropsy for histopathologic and microbiologic examination. Microscopically, acid-fast rods (AFR) after Ziehl-Neelsen staining were observed, and quantitative real-time PCR (qPCR) showed 2.89×10^5 and 1.47×10^4 *M. avium* subsp. *hominissuis* cells per 1 g of intestinal content and mesenteric lymph node, respectively (*8*).

The second case, a 1-year-old full sister to the colt described above, was admitted in July 2009 after 1 month of lethargy, weight loss, diarrhea, and nasal discharge. Ultrasonographic examination of the abdominal cavity showed an increased amount of peritoneal fluid and nonperistaltic, corrugated, and thickened parts of the small intestine in the left caudal region. Local thickening of the jejunum and ileum were found during exploratory celiotomy; no lesions on the cecum or colon were observed macroscopically. Mesenteric lymph nodes were enlarged. Microscopically, AFR were observed, and qPCR showed 3.36×10^6 *M. avium* subsp. *hominissuis* cells per 1 g of mesenteric lymph node (*8*). Treatment with clarithromycin and rifampin was begun, but the condition of the filly improved only temporarily. She was euthanized after 4 months because of progressively worsening condition. Postmortem examination showed enlarged colonic lymph nodes with small nodular lesions, hyperemia of the colon mucosa, and corrugation and thickening of the colonic wall. For further examination, samples

of feces, colonic lymph nodes and wall, liver, mesenteric lymph nodes, kidney, spleen, and diaphragm were taken. Ziehl-Neelsen staining of tissue smears demonstrated AFR in different tissues. Culture examination following the described method (*2*) and qPCR confirmed *M. avium* subsp. *hominissuis* infection; quantities of this agent were 6.31×10^5 and 2.47×10^{11} in 1 g of feces and mesenteric lymph nodes, respectively (Table).

According to a review (*9*), infections caused by *M. avium* subsp. *hominissuis* have been described in only 6 horses until now. We presume that *M. avium* subsp. *hominissuis* infection in both these horses could have been caused by some immunodeficiency related to a genetic predisposition. The shedding of this agent in feces indicates that infected horses can also pose a health risk to humans, particularly immunocompromised persons. *M. avium* subsp. *hominissuis* infection is frequently observed in children, in whom it can cause peripheral lymphadenopathy (*10*). Currently, hippotherapy is a frequently used recreational activity in some countries for various patients, e.g., for children with cerebral palsy. Hippotherapy thus may be associated with a potential risk for humans in contact with clinically ill *M. avium* subsp. *hominissuis*–infected horses.

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References

1. Mijs W, de Haas P, Rossau R, van der Laan T, Rigouts L, Portaels F, et al. Molecular evidence to support a proposal to reserve the designation *Mycobacterium avium* subsp. *avium* to bird-type isolates and *M. avium* subsp. *hominissuis* for the human/porcine type of *M. avium*. Int J Syst Evol Microbiol. 2002;52:1505–18. DOI: 10.1099/ijs.0.02037-0
2. Matlova L, Dvorska L, Ayele WY, Bartos M, Amemori T, Pavlik I. Distribution of *Mycobacterium avium* complex isolates in tissue samples of pigs fed peat naturally contaminated with mycobacteria as a supplement. J Clin Microbiol. 2005;43:1261–8. DOI: 10.1128/JCM.43.3.1261-1268.2005
3. Pavlik I, Matlova L, Dvorska L, Shitaye JE, Parmova I. Mycobacterial infections in cattle and pigs caused by *Mycobacterium avium* complex members and atypical mycobacteria in the Czech Republic during 2000–2004. Vet Med Czech. 2005;50:281–90.
4. Pavlik I, Svastova P, Bartl J, Dvorska L, Rychlik I. Relationship between IS*901* in the *Mycobacterium avium* complex strains isolated from birds, animals, humans and environment and virulence for poultry. Clin Diagn Lab Immunol. 2000;7:212–7.
5. Kazda J, Pavlik I, Falkinham J, Hruska K, eds. The ecology of mycobacteria: impact on animal's and human's health. New York: Springer; 2009.
6. Haist V, Seehusen F, Moser I, Hotzel H, Deschl U, Baumgartner W, et al. *Mycobacterium avium* subsp. *hominissuis* infection in 2 pet dogs, Germany. Emerg Infect Dis. 2008;14:988–90. DOI: 10.3201/eid1406.071463
7. Shitaye EJ, Grymova V, Grym M, Halouzka R, Horvathova A, Moravkova M, et al. *Mycobacterium avium* subsp. *hominissuis* infection in a pet parrot. Emerg Infect Dis. 2009;15:617–9. DOI: 10.3201/eid1504.081003
8. Slana I, Kaevska M, Kralik P, Horvathova A, Pavlik I. Distribution of *Mycobacterium avium* subsp. *avium* and *M. a. hominissuis* in artificially infected pigs studied by culture and IS*901* and IS*1245* quantitative real time PCR. Vet Micro. 2010;20:[Epub ahead of print].
9. Pavlik I, Jahn P, Dvorska L, Bartos M, Novotny L, Halouzka R. Mycobacterial infections in horses: a review of the literature. Vet Med Czech. 2004;49:427–40
10. Bruijnesteijn van Coppenraet LE, de Haas PE, Lindeboom JA, Kuijper EJ, van Soolingen D. Lymphadenitis in children is caused by *Mycobacterium avium hominissuis* and not related to 'bird tuberculosis.' Eur J Clin Microbiol Infect Dis. 2008;27:293–9. DOI: 10.1007/s10096-007-0440-z

Table. Detection of *Mycobacterium avium* subsp. *hominissuis* in tissues of a 1-year-old Fjord filly*

	Mycobacteria detection		qPCR	
Sample source	Microscopy	Culture	IS*1245*†	IS*901*
Feces	–	+	6.31×10^5	–
Lymph node of transversal colon	+	+	1.84×10^9	–
Lymph node of descending colon	+	+	5.89×10^9	–
Transversal colon wall	+	+	3.98×10^7	–
Descending colon wall	+	+	6.33×10^6	–
Liver	–	+	NT	NT
Mesenteric lymph node	+++	+	2.47×10^{11}	–
Kidney	–	+	NT	NT
Spleen	–	+	NT	NT
Diaphragm	–	–	8.22×10^4	–

*qPCR, quantitative real-time PCR; –, negative finding; +, few acid-fast rods; NT, not tested; +++, >100 AFR (per 50 microscopic fields).
†No. IS*1245* copies/g.

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