Author affiliations: National Consiliary Laboratory for Diphtheria, Oberschleißheim, Germany (A. Berger, R. Konrad, A. Sing); Bavarian Health and Food Safety Authority, Oberschleißheim (A. Berger, I. Huber, R. Konrad, S. Hörmansdorfer, M. Hogardt, A. Sing); and Public Health Laboratory of Saxony, Germany (S.-S. Merbeck, I. Ehrhard)

DOI: http://dx.doi.org/10.3201/eid1709.110391

References

1. Bonmarin I, Guiso N, Le Flèche-Matéos A, Patey O, Patrick AD, Levy-Bruhl D. Diphtheria: a zoonotic disease in France? Vaccine. 2009;27:4196–200. doi:10.1016/j.vaccine.2009.04.048

2. Wagner KS, White JM, Crowcroft NS, De Martin S, Mann G, Efstratiou A. Diphtheria in the United Kingdom, 1986–2008: the increasing role of Corynebacterium ulcerans. Epidemiol Infect. 2010;138:1519–30. doi:10.1017/S0950268810001895

3. Lartigue MF, Monnet X, Le Flèche A, Grimont PA, Benet JJ, Durrbach A, et al. Corynebacterium ulcerans in an immunocompromised patient with diphtheria and her dog. J Clin Microbiol. 2005;43:999–1001. doi:10.1128/JCM.43.2.999-1001.2005

4. Hogg RA, Wessels J, Hart J, Efstratiou A, De Zoysa A, Mann G, et al. Possible zoonotic transmission of toxigenic Corynebacterium ulcerans from companion animals in a human case of fatal diphtheria. Vet Rec. 2009;165:691–2.

5. De Zoysa A, Hawkey PM, Engler K, George R, Mann G, Reilly W, et al. Characterization of toxigenic Corynebacterium ulcerans strains isolated from humans and domestic cats in the United Kingdom. J Clin Microbiol. 2005;43:4377–81. doi:10.1128/JCM.43.9.4377-4381.2005

6. Schuhreger R, Schoener C, Dlugaczcyk J, Lichtenfeld I, Trouillier A, Zeller-Peronnitz V, et al. Pigs as source for toxigenic Corynebacterium ulcerans. Emerg Infect Dis. 2009;15:1314–5. doi:10.3201/cid.1508.081568

7. Konrad R, Berger A, Huber I, Boschert V, Hörmandorfer S, Busch U, et al. Matrix-assisted laser desorption/ionisation time-of-flight (MALDI-TOF) mass spectrometry as a tool for rapid diagnosis of potentially toxigenic Corynebacterium species in the laboratory management of diphtheria-associated bacteria. Euro Surveill. 2010;15 pii:pii:19699.

8. Schuhreger R, Lindermayer M, Kugler R, Heesemann J, Busch U, Sing A. Detection of toxigenic Corynebacterium diphtheriae and Corynebacterium ulcerans strains by a novel real-time PCR. J Clin Microbiol. 2008;46:2822–3. doi:10.1128/JCM.01010-08

9. Clinical Laboratory Standards Institute. Methods for antimicrobial dilution and disk susceptibility testing of infrequently isolated or fastidious bacteria; approved guideline. 2nd ed. Wayne (PA): The Institute; 2006. p. M45–A2

10. Bolt F, Cassidy P, Tondella ML, Decoysa A, Efstratiou A, Sing A, et al. Multilocus sequence typing identifies evidence for recombination and two distinct lineages of Corynebacterium diphtheriae. J Clin Microbiol. 2010;48:4177–85. doi:10.1128/JCM.00274-10

Address for correspondence: Andreas Sing, Bavarian Health and Food Safety Authority, Veterinäranstraße 2, 85764 Oberschleißheim, Germany; email: andreas.sing@lgl.bayern.de

Isoniazid-Resistant Tuberculosis, Taiwan, 2000–2010

To the Editor: Vinnard et al. (1) reported that the risk factors associated with initial isoniazid resistance among patients with tuberculous meningitis in the United States during 1993–2005 included young age (25–34 years) and foreign birth (1). In a previous survey, conducted in Taiwan during 2000–2008, we found the rate of antituberculosis drug resistance to be lower for older patients than for younger patients (2); however, current information about the patient characteristics associated with isoniazid-resistant tuberculosis (TB) in Taiwan is lacking. Therefore, to determine the risk factors associated with initial isoniazid resistance among patients with TB in Taiwan, we conducted a retrospective study.

The study was conducted at the National Taiwan University Hospital, a 2,500-bed tertiary care center in northern Taiwan. We analyzed culture-confirmed Mycobacterium tuberculosis isolates obtained from hospitalized patients during January 2000–December 2010. A nonduplicate isolate was defined as 1 isolate collected for evaluation from 1 patient who visited the hospital (as inpatient or outpatient). If multiple isolates were available from a patient, only the one first isolated was analyzed. All specimens were processed and pretreated as described elsewhere (3). Patients with multidrug-resistant TB were excluded on the basis of evidence for differences in the epidemiology of isoniazid-resistant (rifampin-resistant) TB and multidrug-resistant TB (4). Immigrant populations in Taiwan are limited; therefore, we did not analyze the origin of the patients.

After excluding patients with multidrug-resistant TB, we analyzed 4,289 nonduplicate isolates, of which 3,842 (89.6%) were susceptible to isoniazid and the other 447 (10.4%) were resistant to isoniazid. In terms of demographic associations, patients 34–<44 years of age were more likely than those ≥74 years of age to have an isoniazid-resistant strain (Table). In addition, patients with extrapulmonary TB were less likely than patients with pulmonary TB to be infected with isoniazid-resistant TB. We also identified 34 patients with TB meningitis. After excluding 2 patients with multidrug-resistant TB, we found that 31 patients (mean age 56.6 years) had isoniazid-susceptible TB meningitis and a 50-year-old man had meningitis caused by isoniazid-resistant TB.

Our results are in agreement with those reported in a previous study in the United States, which found that the rate of isoniazid resistance was lower for isolates from elderly patients (1,4). This phenomenon may be attributable to the reactivation of a dormant infection. Because isoniazid was introduced to Taiwan for the treatment of TB in 1952, elderly persons in Taiwan probably did not
receive isoniazid if their TB developed when they were young. In the present study, the resistant rate was lower for M. tuberculosis strains isolated from elderly persons than from younger adults. These findings suggest that first-line anti-TB medications still have good in vitro activity against M. tuberculosis strains in elderly patients.

In contrast to the study by Vinnard et al. (1), our results showed that isoniazid-resistant M. tuberculosis was significantly less likely to be isolated from nonrespiratory than from respiratory specimens. The reasons for this finding are unclear. Continuous monitoring of antimicrobial drug resistance among M. tuberculosis isolates isolated from various body sites needs to be incorporated into any TB surveillance program.

Gathering data on drug resistance rates is a major aspect of the global TB control program. Clinicians must have knowledge of local epidemiology, and mycobacteriology laboratories should maintain up-to-date information on drug susceptibility test profiles of local M. tuberculosis isolates.

**Chih-Cheng Lai, Che-Kim Tan, Yu-Tsong Huang, Chun-Hsing Liao, and Po-Ren Hsueh**

Author affiliations: Chi-Mei Medical Center, Liouying, Tainan, Taiwan (C.-C. Lai); Chi-Mei Medical Center, Yong-Kang, Tainan (C.-K. Tan); National Taiwan University Hospital, Taipei, Taiwan (Y.-T. Huang, P.-R. Hsueh); National Taiwan College of Medicine, Taipei (Y.-T. Huang, P.-R. Hsueh); and Far Eastern Memorial Hospital, New Taipei City, Taiwan (C.-H. Liao)

To the Editor: Seahorses (Hippocampus guttulatus and H. hippocampus) with signs of tail rot disease (lethargy, lack of appetite, white spots on the skin, and necrotic tail lesions) were collected from aquaria at the Institute of Marine Research, Spain, during March 2007 through May 2009 (online Appendix Figure, www.cdc.gov/EID/content/17/9/101289-appF.htm). Microscopic examination of cutaneous lesions after Ziehl-Neelsen staining disclosed acid-fast bacilli. Microbiologic analysis showed unidentified *Mycobacterium* strains. Subsequently, we used PCR amplification of repetitive bacterial DNA elements to group the strains (1). The results showed an identical PCR pattern for the strains; thus, we selected strain BFLP-61 for analysis. On the basis of phenotypic and genotypic data, we consider the unknown acid-fast bacillus to represent a novel species of the genus *Mycobacterium*, for which the name *M. hippocampi* sp. nov. is proposed.

**Novel Mycobacterium Species in Seahorses with Tail Rot**

**References**

1. Vinnard C, Winston CA, Wileyto EP, Macgregor RR, Bissop GP. Isoniazid-resistant tuberculous meningitis, United States, 1993–2005. Emerg Infect Dis. 2011;17:539–42.
2. Liu WL, Lai CC, Tan CK, Lin SH, Huang YT, Liao CH, et al. Declining drug resistance of *Mycobacterium tuberculosis* isolates from elderly patients in Taiwan, 2000–2008. Eur J Clin Microbiol Infect Dis. 2010;29:1413–6. doi:10.1007/s10096-010-1019-7
3. Lai CC, Tan CK, Huang YT, Chou CH, Hung CC, Yang PC, et al. Extensively drug-resistant *Mycobacterium tuberculosis* during a trend of declining drug resistance between 2000 and 2006 at a medical center in Taiwan. Clin Infect Dis. 2008;47:657–63. doi:10.1086/591702
4. Hoopes AJ, Kammerer JS, Harrington TA, Ijaz K, Armstrong LR. Isoniazid-monoresistant tuberculosis in the United States, 1993 to 2003. Arch Intern Med. 2008;168:1984–92. doi:10.1001/archinte.168.18.1984

Address for correspondence: Po-Ren Hsueh, Departments of Laboratory Medicine and Internal Medicine, National Taiwan University Hospital, No. 7, Chung-Shan South Rd, Taipei, 100, Taiwan; email: hspsoren@ntu.edu.tw