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Reducing the Risk for Waterborne Nosocomial Neonatal Legionellosis

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is of paramount importance and might provide valued insights into host–microbe interactions.

Our report confirms a novel *Borrelia* IGS sequence type detected in situ from 2 relapsing fever patients. This species showed greatest homology with the relapsing fever borreliae from Africa, *B. recurrentis* and *B. duttonii*, but not with *B. microti*, which is transmitted by *O. erraticus* ticks, previously believed to be the only soft tick species in this region. These findings challenge the assumption that TBRF in Iran is attributed to only *B. persica* or *B. microti*.

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To the Editor: I read with interest the report by Wei et al. (*1*) regarding 2 cases of neonatal legionellosis associated with infant formula prepared with hospital tap water. Two hospitals were involved, and water samples from both were positive for *Legionella pneumophila* bacteria that had molecular profiles indistinguishable from those for bacteria from the infected neonates. As Wei et al. (*1*) and others have established, control of waterborne pathogens, such as *Legionella* spp., in health care institutions remains a work in progress.

Recently, leading medical centers have recognized the efficacy and cost-effectiveness of performing certain measures to ensure the safety of hospital water. These measures include routine microbial analyses of tap water and use of waterborne pathogen prevention and control measures such as hot water flushing of plumbing; use of chlorination, chlorine dioxide, monochloramine, copper–silver ionization, or ultraviolet light; ozonation; and point-of-use water filtration. Each method has advantages and disadvantages related to ease of implementation, cost, maintenance issues, and short- and long-term effectiveness. Randomized controlled trials comparing the efficacy of these strategies are lacking, but the availability of guidance for using waterborne pathogen prevention and control strategies has resulted in substantial declines in health care–associated legionellosis (*2*). Efforts at waterborne pathogen detection and control are complicated by the role of biofilm, comprising microbes embedded in the polymeric matrix attached to internal plumbing surfaces, which protects waterborne pathogens from adverse environmental conditions, including antimicrobial agents and systemic controls (e.g., ultraviolet light, metals, acid pH) (*2*,*3*).

Prevention of legionnellosis in health care settings offers a clinically beneficial and cost-effective alternative to intermittent case detection and outbreak control. For example, it has been demonstrated that, even in the absence of a recognized outbreak, hospital units caring

for immunosuppressed patients can reduce infection rates by using water filtration at the point of use (*4*). Although further efforts are needed to systematically evaluate *Legionella* spp. control measures, a progressive approach to prevent health care–associated legionellosis includes routine microbial analysis of tap water in units for patients at high risk for infection, use of systemic water disinfection technology, and use of point-of-use water filtration in units where care is rendered for patients most vulnerable to infection with *Legionella* spp.

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Carnobacterium divergens Bacteremia in Woman

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To the Editor: *Carnobacterium* spp. are ubiquitous lactic acid bacteria isolated from cold and temperate environments (*1*). They are present in food including fish, meat, and dairy products. Only *C. divergens* and *C. maltaromaticum* (formerly *C. piscicola*) are found in dairy products (*2*). Carnobacteria are well known for their ability to produce bacteriocins that inhibit *Listeria monocytogenes* (*1*). Because *Carnobacterium* and *Listeria* bacteria are psychrotrophic and share the same ecologic niche, many studies have highlighted the potential use of carnobacteria as a biopreservative (*1*). These bacteria were previously believed to be nonpathogenic for humans. We report a case of *C. divergens* bacteremia in a woman.

In January 2013, a 57-year-old woman with a history of diabetes mellitus, severe undernutrition, and chronic alcoholism was admitted to the intensive care unit of the Avicenne Hospital, Bobigny, France, for diabetic ketoacidosis with altered level of consciousness. Physical examination revealed a low body temperature (30.1°C) and epigastric tenderness. At admission, a computed tomographic scan of the abdomen showed pneumoperitoneum with low-abundance ascites. Antimicrobial therapy with piperacillin/tazobactam and amikacin was empirically started. Exploratory laparotomy findings were within normal limits.

Three days after admission, acute necrotizing esophagitis ("black esophagus") with multiple gastroduodenal ulcerations was diagnosed by gastrointestinal endoscopy. By then, septic shock had developed. Antimicrobial drug therapy was empirically changed to imipenem/cilastatin and amikacin. A total esophagectomy with gastrostomy and esophagostomy was performed. No etiology for black esophagus could be established. Parenteral nutrition was begun 24 hours after surgery and relieved with enteral nutrition 72 hours after surgery. On hospitalization day 13, after having clinically improved, the patient consecutively experienced 2 episodes of hypoxemic cardiac arrest and resuscitation. Fever began 2.5 hours later and septic shock again developed. Exploratory laparotomy findings ruled out ischemic colitis.

Four sets of blood cultures collected on 3 days over a period of 5 days showed bacterial growth after 2 days of incubation in the BACTEC 9240 System (Becton Dickinson, Franklin Lakes, NJ, USA). Gram-positive *Listeria*-like rods were seen. Within 24 hours, the isolate grew on trypticase soy agar with 5% horse blood and chocolate PolyViteX agar (bioMérieux, Marcy l'Étoile, France). The colonies were gray, 1–2 mm in diameter, and nonhemolytic. The strain was facultative anaerobic. The catalase reaction was negative, and the esculin hydrolysis reaction was quickly positive. Results of testing with the API Coryne and API Listeria systems (bioMérieux) were unclear. The isolate seemed to be susceptible to penicillins, carbapenems, macrolides, and gentamicin and resistant to cephalosporins. MICs were as follows: penicillin 0.19 mg/L, amoxicillin 0.125 mg/L, amoxicillin/clavulanic acid 0.094 mg/L, cefotaxime >32 mg/L, ofloxacin 1 mg/L, ciprofloxacin 0.38 mg/L, imipenem 0.064 mg/L, vancomycin 2 mg/L, teicoplanin 1 mg/L, linezolid 0.50 mg/L, amikacin 16 mg/L, and rifampin 0.006 mg/L.

Because blood cultures were positive for gram-positive rods susceptible to amoxicillin, our initial diagnosis

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