Answer to December 2011 Photo Quiz

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The Gram-negative rods isolated from the blood cultures at the outside hospital and from the blood and cerebrospinal fluid cultures at our hospital were identified as *Elizabethkingia meningoseptica* using MicroScan WalkAwayplus (Siemens Healthcare Diagnostics, Deerfield, IL). *Elizabethkingia meningoseptica* is a Gram-negative, obligate aerobic, non-spor-forming, non-glucose-fermenting bacillus that is catalase, oxidase, and indole positive and grows on chocolate and blood agars but poorly or not at all on MacConkey agar. It is often described as having a “dumbbell” shape. The thin, filamentous appearance on the Gram stain from the aerobic blood culture bottle in this case (see the figure in the Photo Quiz) is likely caused by the presence of subminimum inhibitory concentrations of antibiotic in the blood. This effect has most often been described for beta-lactam antibiotics, such as piperacillin and cephalaxin, that inhibit cell wall synthesis by binding predominantly to penicillin binding protein 3 (5). Subminimum inhibitory concentrations are not lethal to the organism but prevent cross-wall formation during the process of cell division so that elongated bacteria result.

*E. meningoseptica* is widely distributed in fresh and salt waters, in the soil, and in some animals but is not considered a normal human microflora. The organism was first described in 1959 by Elizabeth O. King, who was studying bacteria associated with infant meningitis at the Centers for Disease Control and Prevention in Atlanta, GA, and described an organism (originally named CDC group Iia) that she subsequently named *Flavobacterium* (“the yellow bacillus”) *meningosepticum* (associated with meningitis and sepsis) (3). In 1994, the organism was reclassified in the genus *Chryseobacterium* (“chryseos” meaning “golden”) (2). In 2005, a 16S rRNA phylogenetic analysis of chryseobacteria showed that *C. meningosepticum* fell outside the *Chryseobacterium* generic tree and it was placed in the new genus *Elizabethkingia* as *Elizabethkingia meningoseptica* (2).

*E. meningoseptica* has been reported as a cause of neonatal meningitis, predominantly in premature newborns and infants in intensive care units and in underdeveloped countries. It is also a rare cause of nosocomial pneumonia, endocarditis, post-operative bacteremia, and meningitis in immunocompromised adults and has recently also been reported to cause soft tissue infection and sepsis in immunocompetent patients and fatal necrotizing fasciitis in a diabetic patient (1, 4, 5). There are limited published antimicrobial susceptibility data. This organism is usually resistant to multiple antibiotics, including extended-spectrum beta-lactam agents, aminoglycosides, carbapenems, aztreonam, and vancomycin (4). The quinolones rifampin and trimethoprim-sulfamethoxazole appear to be most active *in vitro* (4). Of note is that the MICs for piperacillin-tazobactam were 3 μg/ml by Etest and <3 μg/ml by MicroScan for the isolate tested at our hospital. After reviews of the literature and the susceptibility results for the blood and cerebrospinal fluid isolates, the patient was treated with rifampin (MIC ≤ 1 μg/ml), moxifloxacin (levofloxacin MIC = 4 μg/ml), and trimethoprim-sulfamethoxazole (MIC > 2/38 μg/ml). The patient gradually improved, was successfully discharged to an acute rehabilitation unit after 19 days of hospitalization, and was ultimately able to return home.

**REFERENCES**


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