Answer to February 2012 Photo Quiz

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Answer to Photo Quiz: Paracoccus yeei

Paracoccus yeei are obligate aerobic, nonfermenting, Gram-negative cocci, diplococci, or coccobacilli that appear vacuolated or O shaped. The genus Paracoccus is classified within the family Rhodobacteraeaceae and currently contains 31 recognized species. The species Paracoccus yeei was originally classified with other nonfermenting Gram-negative bacteria in CDC eugenic oxidizer group 2 (EO-2). In 2003, 13 EO-2 isolates, all of which had been isolated from human samples, were recognized as belonging to a unique species, Paracoccus yeei (the name was later corrected to P. yeei), on the basis of biochemical tests, DNA-DNA hybridization, cellular fatty acid profiling, and 16S RNA sequencing (1).

P. yeei has been found in a variety of environments. The 16S rRNA gene sequences of several environmental P. yeei isolates have been submitted to GenBank (www.ncbi.nlm.nih.gov/genbank/). These strains were isolated from marine sediments in India and Costa Rica, a spacecraft clean room, a sweet pepper, naturally fermented dairy products, old books in a Korean library, and insecticide-contaminated soil in China. Since the natural habitat of P. yeei is not fully defined, it is difficult to know how patients acquire the organism.

The 13 clinical isolates originally in the EO-2 group were from the United States and Canada. They were obtained from patients aged 6 weeks to 77 years. Sources of these isolates include abdominal dialysate, ankle wound (n = 2), toe, leg lesion, neck incision drainage, cerebrospinal fluid, bile, blood, skin, ear (n = 2), and eye.

Since the species P. yeei was proposed, there have been several additional reports from various countries of P. yeei as an unusual opportunistic human pathogen. A case of peritonitis in a young ambulatory dialysis patient with P. yeei in France has been reported (5). A 67-year-old German man with a history of heart failure developed bullous lesions on his leg, followed by bacteremia with blood and aspirated fluid cultures that grew P. yeei (3).

Several published reports have associated P. yeei with eye infections. One case of eye infection was mentioned in the article that proposed P. yeei as a new species, but no details of the nature of the infection were given. In a study of culture-negative uveitis, P. yeei was associated with a single case detected by PCR and 16S rRNA gene sequencing directly on intraocular fluid specimens (2). In another report, P. yeei was cultured from an aqueous humor specimen from a corneal transplant recipient with rejection and subsequent rapidly progressive infection of the graft (4). Since no other pathogenic microorganisms were detected in the purulent discharge of the patient in our current case, his conjunctivitis was attributed to P. yeei.

Cell wall fatty acid analysis or molecular methods are often used for identification since P. yeei can be difficult to identify using conventional biochemical methods. The Vitek 2 (bioMérieux, Inc., Durham, NC) Gram-negative GN card has also been reported to accurately identify P. yeei (5).

Antibiotic susceptibility profiles have been addressed in some of the case reports. MIC results obtained using reference broth microdilution for the isolate from the peritonitis case report suggest that P. yeei has low MICs for the β-lactam antibiotics, especially the aminopenicillins and carbapenems, and somewhat higher MICs for the broad-spectrum cephalosporins (5). The patient in that case report rapidly improved with intraperitoneal administration of piperacillin and cephalothin.

Diffusion susceptibility testing of the blood and bullous fluid isolate indicated that this isolate was susceptible to ampicillin, ampicillin–sulbactam, amoxicillin–clavulanic acid, piperacillin–tazobactam, cefazolin, cefuroxime sodium, and cefepime, although the interpretive criteria used were not reported. The organism was isolated from the patient in that case, despite ongoing treatment with intravenous cefazolin, but the patient subsequently improved when treatment was changed to oral administration of ofloxacin (3).

The corneal–transplant recipient became infected while being treated with fusidic acid, and his infection progressed despite intravitreal, topical, and intravenous treatment with vancomycin and ceftazidime, but he was also receiving concomitant steroid therapy (topical and subconjunctival) for graft rejection (4).

In our case, the patient had responded to treatment with topical moxifloxacin but not to sulfacetamide in previous conjunctivitis episodes and was treated this time with a ciprofloxacin ophthalmic (0.3%) solution, which resulted in improvement of symptoms.

REFERENCES

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