

## Ocular Infection Caused by *Psychrobacter immobilis* Acquired in the Hospital

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**The name *Psychrobacter immobilis* recently has been proposed for a group of chiefly psychrotrophic, aerobic, gram-negative, nonmotile, oxidase-positive coccobacilli commonly found associated with fish, processed meat, and poultry products. This article reports an ocular infection in a 12-day-old newborn who acquired the infection in the hospital, probably because of frequent manipulations in a closed aerated incubator. Also, this report intends to alert microbiologists to opportunistic infections that might be confused with infections caused by unusual oxidase-positive, gram-negative diplococci and to the isolation of *P. immobilis* from a human infection.**

A new genus, *Psychrobacter*, recently has been proposed for coccobacillary rods that grow at low temperatures and that are aerobic, gram negative, nonmotile, nonpigmented, nonsporulating, catalase positive, oxidase positive, penicillin susceptible, 0.9 to 1.3  $\mu\text{m}$  in diameter, and 1.5 to 3.8  $\mu\text{m}$  long (7) (Table 1). Previously, this group of microorganisms was reported as *Moraxella*-like psychrotrophic bacteria. The *Moraxella*-like group originally classified as *Achromobacter* strains was composed of gram-negative, nonpigmented, saprophytic coccobacilli; both motile and nonmotile strains were included (7, 14). The *Moraxella*, *Acinetobacter*, CDC group EO-2, M-5, and M-6, and *Psychrobacter* bacteria are very closely related. The use of biochemical procedures and a small number of conventional tests permits rapid identification and differentiation of these bacteria (12). *Psychrobacter immobilis* has been associated with fish, processed meat, and poultry in various parts of the world (1, 7, 13, 17). Certain groups of gram-negative, nonmotile, and nonfermentative bacteria isolated from protein-containing food display similar cultural and biochemical characteristics. A simple identification scheme based on five tests has been proposed for the differentiation of *Acinetobacter*, *Pseudomonas*, and *Psychrobacter* spp. (13). Microorganisms previously classified in CDC group EO-2 (EO, eugonic oxidizer) have been studied to determine their relationship to *P. immobilis*. Transformation studies have been suggested to identify the *Psychrobacter* genus definitively (5).

Many infections caused by opportunistic microorganisms, including some *Neisseria* spp., have been reported, especially those that could be confused morphologically with *Neisseria gonorrhoeae* infections of the eye (11, 16), urethra, ear, and other sites (2-4, 6, 8, 9, 15).

**Case report.** A newborn was delivered after premature rupture of membranes 12 h prior to delivery. The child had an APGAR score of 5 to 8, and indirect oxygen was required. The medical examination revealed a Silverman respiratory distress score of 3 and splenomegaly. X-ray examination suggested a grade 2 hyaline membrane syndrome. Congenital syphilis was found and confirmed with laboratory tests. The parents also had syphilis. The child was admitted to the intensive care unit and spent 15 days in an oxygen chamber. For antimicrobial therapy he received 90,000 IU of intravenous penicillin every 12 h for 12 days.

On day 12 of hospitalization, bilateral purulent conjunctivitis was observed. Cultures and smears were submitted for microbiological analysis.

The initial Gram stain showed no microorganisms but a large number of polymorphonuclear leukocytes. A swab containing the pus in Amies transport medium was submitted for culturing. The swab was inoculated on chocolate agar, 5% sheep blood agar, Thayer-Martin agar, and MacConkey agar. The plates were incubated in a  $\text{CO}_2$  atmosphere by the candle jar method at 36°C and observed after 24 to 48 h of incubation. Small grayish colonies were observed on chocolate and Thayer Martin agars; they were positive for oxidase (Kovacs reaction) (10). A Gram stain of the colonies showed gram-negative diplococci of atypical morphology. Acid was not produced from glucose, maltose, lactose, or sucrose on cystine tryptic agar. DNase was not produced. The bacterium did not reduce nitrates to nitrites. In oxidation-fermentation medium glucose did not yield acid aerobically or anaerobically, in contrast to findings in the reference laboratory. Susceptibility was tested on chocolate Mueller-Hinton agar; the microorganism was susceptible to cephalothin, chloramphenicol, gentamicin, and erythromycin. Resistance to penicillin was observed.

A *Neisseria* sp. infection was suspected on the basis of the morphological, cultural, and biochemical characteristics observed for the bacterium. The Gram-stained smear revealed atypical diplococci with morphology suggestive of various gram-negative coccobacilli. Confluent growth was obtained on chocolate and Thayer-Martin media, consistent with the characteristics of *Neisseria* spp. *Branhamella* spp. also were considered, but the DNase test was negative. The bacterium was identified as *P. immobilis* by the Reference Bacteriology Laboratory, Public Health Laboratories, Toronto, Ontario, Canada.

*P. immobilis* is a pleomorphic organism and, when observed in Gram-stained smears, may appear coccoidal and resemble *Branhamella* or *Neisseria* spp.

In the patient discussed here, the infection was acquired nosocomially and the source could have been water or any of the accessories of the humidified chamber. As mentioned above, *P. immobilis* has been associated with water and aquatic organisms.

It is suggested that when exotic infections are caused by

TABLE 1. Summary of the main characteristics of *P. immobilis*

Characteristic	Result
Morphology	Coccobacillary
Motility	-
Catalase	+
Oxidase	+
Spore production	-
Growth at:	
5 to 25°C	+
35 to 37°C	-
Growth on:	
Salmonella-shigella agar	-
Cetrimide agar	-
Oxidative or fermentative carbohydrate base	Oxidative
Acid from:	
Glucose	+
Fructose	+
Mannose	+
Xylose	+
Fructose	-
Maltose	-
Sucrose	-
Nitrate reduction	+
Indole	-
H <sub>2</sub> S in triple sugar iron agar	-
Urea	V+
Phenylalanine	+
Starch hydrolysis	-
Gelatin hydrolysis (7 to 14 days)	-
Lysine decarboxylase	-
Ornithine decarboxylase	-

very rare bacteria, confirmation should be carried out in a competent reference laboratory.

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