Gardnerella vaginalis Bacteremia from Pulmonary Abscess in a Male Alcohol Abuser

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A case of Gardnerella vaginalis bacteremia is reported. This bacteremia occurred in a male alcohol abuser who developed definite signs of pulmonary abscess and empyema. Streptococcus milleri grew from another blood culture, but Gardnerella vaginalis was also isolated from a bronchoscopic aspirate and pleural drainage sample as part of mixed flora containing anaerobes, Streptococcus species, Neisseria sicca, and a Haemophilus sp. We discuss the possible pathogenic character of G. vaginalis outside the genital tract from a review of the literature.

Gardnerella vaginalis is considered an usual pathogen in vaginosis (4, 5) and has been described in infections related to the genital tract, such as postpartum fever (3) and perinatal infections (13). Only few cases of bacteremia were reported, and only one case occurred in a man, after a prostatectomy (12). We report a case in which Gardnerella vaginalis has been isolated from the blood and a pulmonary abscess of a male alcohol abuser.

Bacteriological methods. Blood samples were plated on BACTEC tryptic soy broth (Johnston Laboratories, Towson, Md.) and incubated in a automated incubator; the same specimens were also cultured on Hemoline Diphasic medium and Hemoline anaerobic medium (both from BioMerieux, Marcy l’Etoile, Charbonnières les Bains, France). Material obtained from the respiratory tract was classified by the system of Murray and Washington (10), and class 5 specimens were inoculated on blood agar (CO2), Columbia agar (CO2 and anaerobic), and modified Casman agar (Columbia agar with peptone, naldixic acid, and colimycin) (anaerobic). Specimens from pleural spaces were cultured on the same media.

The different strains were identified by published procedures (7).

The pleomorphic rods seen on the Gram stain of the positive blood cultures and the respiratory tract and pleural specimens were identified as Gardnerella vaginalis according to the following test results: oxidase negative (Pathotec; Organon Teknika, Durham, N.C.), catalase negative, and beta-hemolysis on human blood agar (no hemolysis on sheep blood agar or on horse blood agar). Subsequent tests were done with the API system (Api System, La Balme les Grottes, Montalieu Vercieu, France), and the results were: indole negative, urease negative, Voges-Proskauer test negative, phenylalanine deaminase negative, H2S production negative, hippurate hydrolysis strongly positive, starch hydrolysis positive, esculin hydrolysis negative, gelatin hydrolysis negative, and acid production from dextrose, maltose, starch positive.

Antimicrobial susceptibility was tested by the disk diffusion method approved by the National Committee for Clinical Laboratory Standards (11). The following disks were used: ampicillin (10 μg), penicillin (10 μg), minocycline (30 μg), clindamycin (2 μg) (BioMerieux), and metronidazole (10 μg) (Rosco, Taastrup, Denmark). All the anaerobic strains isolated were susceptible to penicillin, metronidazole, and clindamycin; all streptococci isolated were susceptible to penicillin, minocycline, and clindamycin; Haemophilus parainfluenzae and Neisseria sicca were susceptible to ampicillin.

Case report. A 41-year-old man was admitted to our hospital suffering from clouding of consciousness following a brawl in a bar. He was a chronic alcohol abuser but had no history of medical problems. For several days after admission, he became increasingly stuporous and presented false deglutitions. Subsequently, he became febrile and developed clinical and radiological signs of right-side pneumonia. A pleural tap yielded purulent discharge, but cultures of this fluid and blood cultures remained sterile (Table 1, fluid 1). The patient received cefazidime (2 g intravenously twice a day).

Over the following days, the patient required several bronchoscopic aspirations. Gram stains of all these specimens showed a polymicrobial aspect without predominant strain and mixed strains which were not fully identified but corresponded principally to nonhemolytic streptococci and Corynebacterium-like organisms, reported as “contaminating oral flora.” After 12 days of treatment, cefazidime therapy was stopped, but the following morning, the patient again experienced fever. A second lot of blood samples were drawn, and bronchoaspirates were collected through a fibroscopic device; these specimens showed the same aspect of contaminating oral flora. Penicillin (20 × 106 U/day) therapy was started. Two days later, a thin gram-positive rod grew from one of three blood cultures from this second lot. It is noteworthy that this strain grew in the Hemolene subsulture and not in the automated BACTEC culture. This strain was subsequently identified as Gardnerella vaginalis.

After a slight improvement, the patient had to be intubated and ventilated while a third lot of blood samples and a bronchoscopic aspiration were drawn. The Gram stain of the latter disclosed gram-positive and gram-negative cocci, gram-negative rods, and pleomorphic rods resembling the one isolated in the second lot of blood samples. Penicillin was replaced with minocycline (200 mg twice a day) and metronidazole (500 mg three times a day).

One blood culture from the third lot grew Streptococcus
milleri. The pleomorphic rods from the bronchoscopic aspirates were also identified as Gardnerella vaginalis. The other associated organisms isolated from the bronchoaspirate were Bacteroides orallis, Peptostreptococcus sp., Peptococcus sp., Veillonella sp., Haemophilus parainfluenzae, Streptococcus milleri, and Neisseria sicca.

In view of the development of a radiological cavity in the right lower pulmonary lobe with empyema and of the isolates found in the bronchial aspirate, metronidazole therapy was stopped, clindamycin and ampicillin were added to the minocycline therapy, and a pleural drainage tube was inserted. The discharge was purulent and revealed on culture S. milleri, Bacteroides orallis, N. sicca, and G. vaginalis (Table 1, fluid 2).

Two days later, clindamycin and minocycline therapy was stopped and chloramphenicol was injected in the pleural space. Three days after insertion of the pleural drain, the patient collapsed. An emergency bronchoscopy showed inundation of the bronchial tree arising from a major fistula- tion between the abscess and the pleural space. No material was collected in this procedure, during which the patient died.

Discussion. Our patient presented definite signs of lung abscess and empyema following inhalation pneumonia, and Gardnerella vaginalis was isolated from the bronchoaspirate, the pleural fluid, and one blood culture. The antibiotic regimen was changed often, not always with good rationale, and chest tube insertion was probably delayed too long.

Concerning the microbiological data, we were impressed with the isolation of G. vaginalis from the specimens collected. Obviously, there was a late recognition of this strain in the two earlier lots of specimens collected.

Gardnerella vaginalis, previously classified as Corynebacterium and subsequently as Haemophilus, is a pleomorphic, gram-negative to gram-variable, nonencapsulated, and nonmotile rod which does not produce filaments. It is catalase and oxidase negative, produces acid from maltose and starch, hydrolyzes hippurate, and hemolyzes human but not sheep blood. It grows as fastidious organisms (6, 7). These characteristics can hinder the recognition of it as a possible pathogen in fluids, where it is not expected, and can explain why it was not identified even if present in the first specimens obtained from the respiratory tract from our patient. We identified the pathogen only because we were impressed by the same pleomorphic rod aspect on Gram stain in both the blood culture and bronchoaspirate fluid culture.

We were also surprised to retrieve it in the Hemolin bottle and not in the BACTEC bottle. Yet, La Scola et al. (8) point out the possible difficulties in subculturing Gardnerella vaginalis from blood in automated devices such as the BACTEC. In one case of septicemia, the BACTEC did not reveal the presence of Gardnerella, while a blood sample taken simultaneously, cultured by direct inoculation on a chocolate- and blood-enriched plate, and incubated for 60 h at 37°C in a 5% CO2-enriched atmosphere showed the growth of 6 and 12 CFU in 6 h (8).

Nevertheless, this could be the first reported case of lung abscess and empyema in which Gardnerella vaginalis is associated with pathogens typically present in the oral cavity and classically present in inhalation pneumonia. Furthermore, these collections of flora resulted in two bacteremic episodes, of which one was due to G. vaginalis.

In view of the absence of previous reports of isolation of Gardnerella vaginalis from respiratory tract fluids, we first investigated the possibility that samples were contaminated during collection or isolation and identification. The positive blood sample was drawn in the pulmonary unit, and the bronchoscopic sample and pleural fluid were collected by the intensive care unit staff on another floor of the hospital. The units in which the blood samples and the pleural fluid and sputum samples were analyzed are in two different sections of the microbiological laboratory, and the work was performed by different teams. The identification as Gardnerella vaginalis was confirmed by another microbiological team in a reference hospital. The organism thus seems not to be a contaminant but part of the infecting flora of the patient; furthermore, it was isolated from three different sites within a period of 12 days.

First described by Gardner in “nonspecific vaginitis,” Gardnerella vaginalis (previously known as Corynebacterium vaginalis and then as Haemophilus vaginalis) is a well-known bacterial species implicated in vaginosis (4, 5). It has also been described in postpartum fever by Edmund (3); it was isolated from vaginal secretion samples taken from 71% of women with puerperal fever (from 92% if the fever was higher than 38.7°C), while it was isolated in only 30% of vaginal secretion samples taken from women with a normal postpartum period (3).

Later on, this species was recovered from extravaginal sites: Platt (13) reported two personal cases and collected in the literature eight cases of postpartum, fetal, or neonatal sepsis. Fetal infection resulted in fetal death or abortion, neonatal sepsis caused pneumonia and a suppurative scalp lesion, and maternal sepsis consisted of endometritis and puerperal fever. None of these cases were stated to be bacteremic (13).

Six other reports relate a total of 64 cases of bacteremia or septicemia, of which 5 occurred in newborns. All 64 septicemic episodes except 1 were related to obstetrical or gynecological disease (Table 2). The exception occurred in a diabetic old woman with cellulitis in an amputated limb (1, 2, 9, 14–16). Most of the bacteremia cases were polymicrobial, and (except for the case of cellulitis) G. vaginalis was regularly isolated from the site of genital infection, among other pathogens.

The only record of Gardnerella vaginalis bacteremia in a
TABLE 2. Published cases of bacteremia with *G. vaginalis* in women and newborns

<table>
<thead>
<tr>
<th>Reference</th>
<th>Yr</th>
<th>Parturient mothers</th>
<th>Newborns</th>
<th>Women with gynecological pathology</th>
<th>Women without gynecological or obstetrical pathology</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regamey et al. (14)</td>
<td>1973</td>
<td>1</td>
<td></td>
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<tr>
<td>Carney (2)</td>
<td>1973</td>
<td>3</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Monif and Baer (9)</td>
<td>1974</td>
<td>13</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Venkataramani and Rathburn (16)</td>
<td>1976</td>
<td>23</td>
<td>4</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Adeniyi-Jones et al. (1)</td>
<td>1980</td>
<td>7</td>
<td></td>
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<tr>
<td>Reimer and Reller (15)</td>
<td>1984</td>
<td>25</td>
<td>5</td>
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* Samples of cord blood were also positive.  
* Two babies died.

man that we could find was reported by Patrick and Garnett and came from a urinary tract infection 3 days after a prostatectomy. The urine revealed 20 leukocytes per field and <$10^3$ CFU of an unidentified microbe per ml, and on the seventh day, all four blood samples taken before treatment showed growth of *G. vaginalis* (12). Obviously, isolation of *Gardnerella vaginalis* is rare for blood samples drawn from febrile women with gynecological or obstetrical infection and has not yet been described for men suffering from infection outside the genital area.

In conclusion, our patient presented definite signs of inhalation bronchopneumonia with abscess and septicemia, due in part to *Gardnerella vaginalis*. To our knowledge it is the first report of such a case. Because our patient died, we were unable to investigate the possibility of a previous colonization of the oral cavity of this sexually active 41-year-old man. This possibility deserves further exploration.

**LITERATURE CITED**