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Septicemia Caused by *Propionibacterium granulosum* in a Compromised Patient

CATHERINE BRANGER, BÉATRICE BRUNEAU, AND PHILIPPE GOULLET*

Service de Microbiologie, Hôpital Beaujon (Université Paris VII), 92110 Clichy, France

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A case of septicemia caused by *Propionibacterium granulosum* in a compromised patient is described. The patient responded to ampicillin therapy. Detailed antibiotic susceptibility data are presented.

Cutaneous propionibacteria are among the most numerous organisms residing on human skin (6). These organisms are common contaminants of blood cultures and have traditionally been considered nonpathogenic for man. However, *Propionibacterium acnes* has been increasingly recognized as a pathogen, being implicated in endocarditis, meningitis, and arthritis (5, 8, 9). Isolated from sebum-rich areas of the skin but in smaller numbers than *P. acnes* (6), *P. granulosum* may play a part, along with *P. acnes*, in the pathogenesis of acne (2). Documented serious infections by *P. granulosum* are uncommon. In 1960, Prevot, reviewing the literature and concepts concerning anaerobic corynebacterial infections, mentioned 16 cases of infections in which "*Corynebacterium granulosum*" was isolated (7).

We describe a case of septicemia caused by *P. granulosum* and present detailed antimicrobial susceptibility data for this isolate.

A 38-year-old woman with a paucity of interlobular bile ducts was hospitalized in September 1986 for evaluation of a hepatocellular carcinoma. She had a congenital cardiopathy (atrial septal defect and stricture of the pulmonary artery) and had received treatment with penicillin and streptomycin for endocarditis caused by *Streptococcus sanguis* in 1975. On 21 September 1986, the patient had a hepatic arteriography and a hepatic puncture for biopsy. By 22 September 1986, she had developed generalized weakness, fever (39°C), and chills. Her polynuclear leukocyte count went from 5,000 to 12,300/mm^3. Although an echocardiogram disclosed no evidence of valvular vegetation, endocarditis was suspected. A total of 18 sets of blood cultures (Hemoline performance; Biomerieux, Marcy l'Etoile, France) were taken over a period of 5 days between 23 and 28 September 1986, and treatment of the patient was begun with intravenous ampicillin, 12 g/day. Body temperature decreased to normal 6 days after the commencement of the treatment. A total of 13 sets of blood cultures became positive after 10 days of incubation and showed gram-positive coccoid anaerobic organisms. After 48 h of incubation at 37°C, the chocolate agar and Columbia agar subculture plates, incubated anaerobically, yielded growth. Colonies on chocolate agar were gray, creamy, and larger than those on Columbia agar plates. Subcultures were negative when incubated aerobically or with CO_2, even after several transfers. Gram strain of subcultures showed a pleomorphic, rod-shaped, branched, gram-positive organism. We identified the organism as *P. granulosum* on the basis of an API 20A system (API System S.A., La Balme les Grottes, France). The identification of the strain was subsequently confirmed by the anaerobe laboratory (M. Sebald) of the Institut Pasteur, Paris, France.

In most cases, the problem of identifying strains of propionibacteria is one of distinguishing them from morphologically similar organisms (e.g., members of the genera *Actinomyces*, *Arachnia*, and *Corynebacterium*). In our case, the microorganism grew strictly anaerobically (*Corynebacterium* spp. generally grow very much better aerobically than anaerobically) and was catalase positive (*Arachnia propionica* and most of the *Actinomyces* spp. are catalase negative) (2). *P. granulosum* was differentiated from *P. acnes* by the ability to ferment maltose and sucrose and by lack of production of indole. Since little information about the antibiotic susceptibility of *P. granulosum* was found in previous publications, we determined the MICs of 25 antibiotics by the agar dilution technique, on Wilkins-Chalgren medium supplemented by the addition of Tween 80 (0.02%). Strains were grown for 48 h in Wilkins-Chalgren broth, and plates were inoculated with 10^5 organisms by using a Steers replicator. Antimicrobial activity controls with *P. acnes* 936B, 303C, and H101, obtained from the anaerobe laboratory of the Institut Pasteur, were included with each assay. The results are shown in Table 1. The MIC results indicate that the isolate was susceptible to all the antimicrobial agents tested except metronidazole, sulfonamide, fosfomycin, and tobramycin. Gentamicin, streptomycin, amikacin, pefloxacin, and chloramphenicol were able to attack *P. granulosum*, but their activity range was poor. These findings agree with those of other published studies (4). Imipenem was the most active drug tested among the penicillins, and cefotaxime was the most active among the cephalosporins. Our results are similar to those obtained for *P. acnes* (3).

The activities of penicillin G (1 μg/ml) and vancomycin (10 μg/ml) combined with streptomycin (10 μg/ml) or gentamicin (2.5 μg/ml) were evaluated by determining the killing curve with an inoculum of 10^6 CFU/ml (1) using Wilkins-Chalgren broth. Samples were removed for colony counts after 1, 3, 6, and 18 h and incubated on chocolate agar plates anaerobically. All combinations were found to be synergistic.

Our observation suggests that *P. granulosum* cannot be routinely dismissed as a contaminant of clinical specimens and must be considered potentially significant. It requires prolonged incubation for isolation: in our case, the organism was not recovered from blood culture before 10 days. *P. granulosum* should be added to the list of opportunistic pathogens that may cause systemic infection in patient with underlying disorders.

Routine hepatic arteriography and hepatic puncture for biopsy usually do not require prophylaxis. Because this

* Corresponding author.

TABLE 1. Susceptibility of *P. granulosum* to 25 antimicrobial agents

Antibiotic	MIC (μg/ml)
Penicillin G	0.06
Ampicillin	0.03
Cephalothin	0.12
Cefamandole	0.25
Cefotaxime	0.06
Moxalactam	1
Mezlocillin	0.12
Piperacillin	0.12
Imipenem	0.015
Tetracycline	0.12
Minocycline	0.12
Chloramphenicol	16
Erythromycin	0.015
Clindamycin	0.03
Rifampin	0.003
Sulfonamide	1,024
Trimethoprim	4
Pefloxacin	4
Fosfomycin	512
Streptomycin	16
Gentamicin	2
Tobramycin	32
Amikacin	16
Vancomycin	0.5
Metronidazole	1,024

patient had no clinical or bacteriological proof of endocarditis before these investigations and no evidence of valvular vegetation, only hepatic arteriography or hepatic puncture could be implicated in the bacteremia. This demonstrates that antibiotic prophylaxis is needed during exploration with a risk of bacterial contamination in patients with cardiopathy.

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