



## A CASE REPORT ON CUTIBACTERIUM ACNES- FROM COMMENSAL TO PATHOGEN

### Microbiology

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### ABSTRACT

*Propionibacterium acnes* (*Cutibacterium acnes*) is an anaerobic, gram-positive, slow growing bacteria. It can produce various virulence factors like bioactive exocellular products and metabolites. *P.acnes* blood isolates were considered significant if two or more separate blood culture sets were positive on the same day and if systemic inflammatory response syndrome (SIRS) was present without any alternate explanation. *C.acnes* if found in the blood of patients with implantable cardiac devices it should be considered as more than just a skin contaminant. These patients should be treated with appropriate therapies to prevent annihilatory consequences.

### KEYWORDS

Biofilm, endocarditis, bacteremia, blood culture

### INTRODUCTION:

*Propionibacterium acnes* (*Cutibacterium acnes*) is an anaerobic, gram-positive, slow growing bacteria. It has complex structure and a fibrillar layer. It is found as a normal flora on the oral cavity, skin, gastrointestinal tract, conjunctiva and external ear canal. It owns many elements of a disease causing pathogen (1,2). It is found as a potential agent in implant-associated infections because of virulence factors like biofilm produced by it. It can also cause opportunistic infections by seeding into other organs to cause invasive infections (3). It can cause produce various virulence factors like bioactive exocellular products and metabolites. It also has inflammatory, immunomodulatory and chemoattractant properties (4).

### Case Report:

A 64 yrs male, known case of coronary artery disease (Ischaemic cardiomyopathy), undergone CABG 3 years back, Type II diabetes mellitus on oral hypoglycemic drugs, came with complaints of fever that was mild intermittent not associated with chills and rigor, no diurnal variation, breathlessness Grade III, associated with orthopnoea, chest discomfort and tightness, relieved on sitting down, not radiating, not associated with sweating and palpitations, no complaints of chest pain, complaints of cough with mucopurulent expectoration, not blood stained since 10 days.

On Examination- Pulse rate -116/min, Temperature-100°F, BP-120/80, JVP-elevated, Respiratory system examination showed occasional crepitations, left infrascapular bilateral wheeze plus, respiratory rate was 24/min. Other systemic examination were normal. Not a known case of hypertension, bronchial asthma, seizure disorder. ECG showed T wave inversion in lead Av1, v5, v6 and ST depression in V5, V6. 2D ECHO showed dilated LA/LV, global hypokinesia of LV, severe LV systolic dysfunction, moderate MR, trivial AR, mild TR (SIRS).

Aerobic sputum culture was sterile. Two blood samples collected on the same day was sent for aerobic and anaerobic culture. Aerobic blood culture was sterile. Both the anaerobic blood cultures showed small white opaque non-hemolytic colonies on anaerobic blood agar. Anaerobic blood agar showed small white opaque non-hemolytic colonies.

Gram stained smear of the corresponding colonies showed pleomorphic gram positive bacilli. Catalase, indole and nitrate test were positive, the organism was sensitive to Vancomycin, kanamycin, metronidazole and resistant to colistin. Based on the presumptive identification tests, the bacilli was identified as *Propionibacterium acnes* (*C.acnes*). The patient was treated with iv.ceftriaxone twice daily for 7 days and prescribed with oral Azithromycin once a day for 5 days. The patient's condition improved.

### DISCUSSION:

*P. acnes* is normally regarded as a contaminant in blood cultures as it is present as a normal flora on human skin and is often not diligently treated. *P.acnes* can rarely cause invasive infections like endocarditis, osteomyelitis, mediastinitis, discitis, prosthetic joints and heart valves, postoperative and device-related infections. It is associated with conditions like sarcoidosis, synovitis, acne, pustulosis, hyperostosis and osteitis (SAPHO) (5).

*P. acnes* blood isolates were considered significant if two or more separate blood culture sets were positive on the same day and if systemic inflammatory response syndrome (SIRS) patients should have at least two of the following four criteria: (i) body temperature of >38.0 or <36°C, (ii) heart rate of >90 beats per minute, (iii) respiratory rate of >20 breaths per minute, and (iv) peripheral white blood cell counts of >12,000/mm<sup>3</sup> or >10% (6). In our study also two culture sets taken on the same day were positive. The patient had three components of SIRS.

In a case series by Sohail et al., 7 of 8 patients diagnosed with *C. acnes* endocarditis from 1967–2005 were men who ranged from 46 to 80 years of age which is similar to our study (7). Implant-associated infections are an enormous medical and economic problem because of the increased use of implants and an aging population. Invasive infections with *P.acnes* most often manifest as infections of indwelling medical devices (8,9). In our study also the patient had undergone CABG 3 years back. One study by Park et al. examined 522 patients with *P. acnes* bacteremia, only 18 (3.5%) patients had clinically significant bacteremia. The mortality rate is relatively high (15 to 27%) due to major valvular and perivalvular destruction associated with a delayed diagnosis of disease (10).

### CONCLUSION:

To summarize, our results adds to the point that when *C. acnes* is found in the blood of patients with implantable cardiac devices it should be considered as more than just a skin contaminant. *C. acnes* can rarely cause bacteremia as it has pathogenic potential and may be associated with mortality and hence should not be disregarded in patients who have undergone invasive procedures, or with underlying malignancy or hospital-acquired infections in those with implanted devices. These patients should be treated with appropriate therapies to prevent annihilatory consequences.

### CONFLICTS OF INTEREST:

The authors declare no conflicts of interest.

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