

Abiotrophia defectiva: briefs comments of an etiological agent to consider in infections with conventional microbiological culture-negative

Background

Abiotrophia is a separate genus of Gram-positive cocci formerly classified as nutritionally variant streptococci (NVS). These microorganisms' forms part of the human oropharyngeal, gastrointestinal & urogenital habitual microbiota, and cause 1% - 2% of all infective endocarditis (IE), with the particular characteristic than these bacteria do not usually grow on conventional blood agar plates (culture-negative IE). Therefore, *Abiotrophia* endocarditis is classified into the category of culture-negative endocarditis, and their suspected implication should be informed to the microbiology laboratory to implement the recovery and isolation techniques to obtain the final identification of it, because the NVS are fastidious Gram-positive bacteria, requiring either L-cysteine- or pyridoxal-supplemented medium to support growth. We advised the physicians in culture-negative pathologies (besides IE) to think outside the box, and consider *Abiotrophia* participation in some infections without an etiological agent able to be identified, as we demonstrated in 2 of the 5 patients that we described. Is important to keep in mind this agent because their specific antimicrobial therapy could be failed in some cases, and the continued surveillance is needed to prevent the significant morbidity and mortality associated with this infection.

Goal

To briefly describe 5 isolates of *A. defectiva* in clinical samples of 5 patients with previous negative cultures (3 with infective endocarditis -IE-, 1 with pulmonary granulomatous disease & 1 with chronic pungent vaginal discharge), received at the Medical Microbiology Unit Laboratory in the year 2010.

Material & methods

In 2010, five patients' samples were received and processed for culture and isolations of aerobic & anaerobic bacteria, fungus and mycobacterial agents (slow and fast-growing) according to the physicians' request. The stains of them were performed too. All the primary cultures were negative. After the suggestion to perform the investigation of unfrequently & fastidious microorganisms', new samples arrive to our medical microbiology unit facility as follow:

- I. 6 blood cultures (by duplicate) of 3 patients with clinical, echocardiographic and microbiological diagnosis of culture-negative IE.
- II. 4 pleural fluid samples from a patient with suspected infectious granulomatosis, with fungal and mycobacterial culture negatives.
- III. 2 samples of cervix-vaginal swab of patient with pungent vaginal discharge, negative for demonstration of specific vaginitis agents and bacterial vaginosis.

Results

All samples were processing following CLSI recommendations. Blood cultures and the rest of the samples were incubated and shows growth in liquid media (turbidity at 24-36 hours) with a Gram stain

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that reports "Gram-positive cocci in short chains", but with a negative subculture in the blood agar plates, a positive subculture in the enriched media (Chocolate agar incubated at 35°C in a humidified atmosphere with 5% CO₂) and the blood agar plate with a *S. aureus* stria (Satellite growth at the sides of the stria, at hemolysis zone). The growth of satellites bright white microcolonies, with alpha hemolysis and a Gram stain that shows Gram-positive cocci, in short chains & pairs. The biochemical tests results were: Catalase negative, PYR (L-Pyrrolidonyl-arilamidase) positive, Bilis-Esculin negative, and lactose & trehalose fermentation positive; all of it leading to the identification of *A. defectiva* as the causative agent of the diseases in the five patients.

Discussion

Lack of isolation in all previous cultures could be addressed to the no consideration of "fastidious" or demanding agents, and it was a primary diagnostic failure from the physician and the microbiology laboratory has the obligation to advise the need to expand the search to this kind of agents. So, if necessary, the two-ways communication between the clinic setting and the laboratory setting to improve the response time and perform accurate diagnosis that improves patients' treatment and recovery. The susceptibility test for Broth Micro dilution following recommendations of the Document M45-A2 CLSI (2010) demonstrating susceptibility to all tested antimicrobials (penicillin, oxacillin, ceftriaxone, vancomycin, clindamycin, linezolid, levofloxacin and gentamycin), and all patients have received at least 2 of this antimicrobial agents for the treatment of their diseases, but without any improvement signs, so, is time to consider the biofilm-producing strains as a factor to therapeutic failure?, but, all the isolated strains were negative for biofilm-production! So, a deep review of the antibiotic treatment record reveals that maybe the treatment times were responsible for the lack of improvement, because the recommended treatment duration for the *Abiotrophia* isolates is prolonged and the antimicrobial agents' combination is a great advice not only for IE.

All the patients show improvement of its conditions with clinical and microbiological cure demonstrated at the end of a prolonged (3–6 weeks) and combined antimicrobial therapy. Is necessary the adequate determination of gender and species in order to optimize therapeutic regimens, and follow the antimicrobial susceptibility tests results, including new and powerful antimicrobials like daptomycin.

Conclusion

In cases where there is clinical suspicion of infection by species of *Abiotrophia* sp. and with conventional negative cultures, it is necessary to use supplemented liquid media or solids media enriched with pyridoxine and / or chocolate agar or use the technique of detection by satellite growth with a *S. aureus* strain to achieve the approximation to the microbiological diagnosis of this fastidious bacteria.^{1–5}

Acknowledgments

None.

Conflicts of interest

Authors declare that there are no conflicts of interest.

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