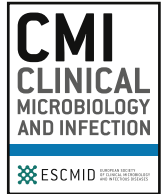




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Letter to the Editor

Re: 'Critical factors in the recovery of pathogenic microorganisms in blood' by Wilson et al.

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To the Editor,

We read with interest the recent narrative review by Wilson [1] on the critical factors in the recovery of pathogenic microorganisms from the blood. Although we agree with many points mentioned in this review, we want to provide some remarks.

First, we agree that most pathogens in blood cultures are recovered within 5 days of incubation. Yet, prolonged duration of incubation might be useful, including for the detection of *Cutibacterium acnes* and *Candida albicans* cases of endocarditis. If blood cultures are terminated after 5 days of incubation, positive follow-up blood cultures under antibiotic therapy may be missed. In our centre, an endocarditis referral centre, BD BACTEC® Plus Aerobic and Anaerobic bottles (BD Diagnostics, Heidelberg, Germany) are incubated for 14 days where there is clinical suspicion of infective endocarditis. Analysing data from 2015 to 2019 shows that if these blood cultures had been terminated after 5 days of incubation, 74 of 1861 (4%) blood-culture bottles positive for one pathogen would have been missed (0.4% of total). Of these, ten were positive for *Staphylococcus aureus*, nine for *Enterococcus* spp. and five for Gram-negative bacteria. The end of *S. aureus* bacteraemia, which is important for the duration of antibiotic therapy, would not have been established at the accurate day in five individuals while they were on antibiotic therapy.

Second, in the narrative review no suggestion was made regarding the incubation duration for optimal detection of *C. acnes* in blood-culture bottles. The groups of Banzon, Liesman and Fida suggest an incubation duration of 14 days to detect *C. acnes*

endocarditis [2–4]. In our centre, between 2015 and 2019, six individuals (four male, two female) with *Cutibacterium* spp. endocarditis were detected on the basis of blood cultures, with times to detection between 4 and 14 days (median 7 days). In four of them, *C. acnes* was detected for the first time at days 6, 8, 11 and 14, respectively. So, the cause of endocarditis would have been missed if blood cultures had been terminated after 5 days, and indeed 14 days were needed to detect all cases.

Last, related to the second issue, the specific blood-culture bottle and type of medium must be taken into account. Rentenaar et al. [5] showed that Plus Anaerobic medium had suboptimal performance for the detection of *C. acnes* isolates in comparison to Lytic Anaerobic vials (both from BD Diagnostics) and that use of Plus Anaerobic vials may require terminal subculture of negative vials for recovery of *C. acnes* [5].

In conclusion, we support the suggestion of others to prolong incubation duration of blood-culture bottles to 14 days in order to detect *C. acnes* when there is clinical suspicion of endocarditis [2–4] and, in addition, to detect positive blood cultures while individuals suspected for endocarditis are receiving antibiotic therapy. This might not be feasible or cost-effective in all laboratories, but in our opinion is important in endocarditis referral centres. In addition, the specific type of blood culture bottle used should be well considered.

Transparency declaration

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References

- [1] Wilson ML. Critical factors in the recovery of pathogenic microorganisms in blood. *Clin Microbiol Infect* 2020;26:174–9.
- [2] Banzon JM, Rehm SJ, Gordon SM, Hussain ST, Petterson GB, Shrestha NK. *Propionibacterium acnes* endocarditis: a case series. *Clin Microbiol Infect* 2017;23:396–9.
- [3] Liesman RM, Pritt BS, Maleszewski JJ, Patel R. Laboratory diagnosis of infective endocarditis. *J Clin Microbiol* 2017;55:2599–608.
- [4] Fida M, Dylla BL, Sohail MR, Pritt BS, Schuetz AN, Patel R. Role of prolonged blood culture incubation in infective endocarditis diagnosis. *Eur J Clin Microbiol Inf Dis* 2019;38:197–8.
- [5] Rentenaar RJ, Kusen SM, Riemens-van Zetten GMA, van Mourik MSM. Detection of clinical *Cutibacterium acnes* isolates in different Becton Dickinson blood culture vials. *J Clin Microbiol* 2018;56:e01486-17.

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