Microorganisms that commonly cause infective endocarditis- what about Aerococcus in the Duke-ISCVID criteria?

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CORRESPONDENCE

Microorganisms That Commonly Cause Infective Endocarditis: What About *Aerococcus* in the Duke–International Society for Cardiovascular Infectious Diseases Criteria?

To the Editor—International Society for Cardiovascular Infectious Diseases (ISCVID) criteria, recently published in *Clinical Infectious Diseases*, include important revisions to the microbiological aspects of the diagnostic criteria for infective endocarditis (IE) [1]. The revised criteria provide useful simplifications for the interpretation of blood culture results in relation to whether a bacteremia constitutes a major or a minor Duke–ISCVID criterion [1–3]. The most significant change, however, is that a number of pathogens have been added to the list of "microorganisms that commonly cause IE." For such pathogens, 2 positive blood cultures are sufficient to be regarded as a major Duke–ISCVID criterion. The inclusion of an increased number of microorganisms that commonly cause IE is claimed to increase the sensitivity of the criteria [4], but this remains to be proven for most pathogens. Moreover, the reclassification will likely decrease the specificity of the Duke–ISCVID criteria, resulting in an increased number of possible IE cases.

Whereas several bacterial species that can cause IE, such as *Staphylococcus lugdunensis*, *Streptococcus dysgalactiae*, *Streptococcus agalactiae*, *Abiotrophia*, *Granulicatella*, and *Gemella*, have been "upgraded" to microorganisms that commonly cause IE, *Aerococcus* spp. are not regarded as common causes of IE. Thus, 3 positive blood cultures for *Aerococcus* spp. are needed to fulfill the major microbiology criterion [1].

IE caused by *Aerococcus* was described in 1991 [5]. However, it was only after the introduction of matrix-assisted laser desorption/ionization time-of-flight mass spectrometry for species determination of bacteria that *Aerococcus urinae* was found to be a relatively common IE-causing organism [6, 7]. Most reports on *A. urinae* IE have been case reports, but some larger case studies have also been published [5, 8]. From published cases, it is clear that *A. urinae* IE affects older men with underlying urinary tract pathology [9].

Aerococcus urinae can evidently cause IE, but does that make it a microorganism that commonly causes IE? In Table 1, the percentage of patients with bacteremia that have IE is shown, comparing the new common IE pathogens in the Duke-ISCVID criteria and *A. urinae*. Many studies were performed in different settings and with different methodologies, hampering direct comparisons. However, some studies evaluated the risk for IE with several pathogens, making comparisons more accurate; these are presented in the 4 right-hand columns of Table 1.

We believe that the available evidence suggests that *A. urinae* has a similar propensity to cause IE compared with most bacterial species regarded as microorganisms that commonly cause IE according to the Duke–ISCVID criteria [1]. The same article quoted in the Duke–ISCVID criteria [1] to justify the inclusion of *Abitrophia*, *Granulicatella*, and *Gemella* as common IE pathogen shows that *A. urinae* should be placed in the same category of pathogens [11]. The risk for IE in bacteremia with *A. urinae* is likely significantly higher than the risk for IE in *S. dysgalactiae* bacteremia (Table 1). We suggest that *A. urinae* be given the same status as the other microorganisms that commonly cause IE in the next revision of the Duke–ISCVID criteria.

Table 1. Proportion of Patients With Infective Endocarditis (IE) Among Patients With Bacteremia With *Aerococcus urinae* and Typical IE Pathogens According to Duke–International Society for Cardiovascular Infectious Diseases

	Studies On Single Species		Studies Comparing Different Species			
Pathogen	IE (%)	Reference	IE (%) [10]	IE (%) [11]	IE (%) [12][a]	IE (%) [13]
Aerococcus urinae	2.6, 10, 18, 19; 35%	[5, 7, 14–16]	…	5.4%	…	…
Abiotrophia defectiva	…	…	45%	21%	…	…
Gemella	…	…	4.0%	6.4%	…	…
Granulicatella	…	…	17%	6.7%	12%	…
Staphylococcus lugdunensis	6.3, 6.8; 46%	[17–19]	…	…	…	…
Streptococcus agalactiae	5.0%	[20]	…	…	9.1%	6.0%
Streptococcus dysgalactiae	0.9, 1.0; 1.4%	[21–23]	…	…	6.4%	0%

Abbreviation: IE, infective endocarditis.

[a]This is the only study in which an IE diagnosis was determined using *International Classification of Diseases, Tenth Revision, Clinical Modification*, codes only. It is referred to in the 2023 Duke–International Society for Cardiovascular Infectious Diseases criteria [1].

Note

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