APPENDIX: Comparison of the use of 16S rDNA polymerase chain reaction (PCR) and gene sequencing with microbiological techniques to diagnose infectious endocarditis (IE)

Reference	Number of patients/valves/blood cultures	16S PCR sensitivity/specificity
1	Valve material: 18 IE patients (n=10 IE of aortic valve, n=3 IE of mitral valve and n=2 prosthetic valve IE)	Valve material: 15/18 positive
2	Valve material: 30 IE patients (n=9 definite IE†, n=21 controls*) Blood cultures: 47 patients (≥3 sets) (n=18 definite IE, n=3 possible IE, n=26 rejected†) (n=5 controls*)	Valve material: 9/29 positive Blood culture: 10/25 positive
3	Valve material/blood culture: n=4 patients definite IE, n=4 patients possible IE† (B/Cs from 7, valve extract from 1)	All 16S rDNA positive (*Staphylococci*), MRSA n=1, MSSA n=3, CoNS n=4
4	Valve material: 2 IE patients (culture negative) plus B/C's	16S PCR V3 primer 100%
5	Whole blood: 51 patients with suspected bacteraemia	Sensitivity 86.7%, specificity 86.9%, PPV 76.5%, NPV 94.1%
6	Valve material: 49 IE patients (n=22 definite IE, n=13 possible IE, n=14 rejected†)	Sensitivity 82.6%, specificity 100%, PPV 100%, NPV 76.5%
7	Valve material: 52 patients (n=38 suspected IE†, n=14 controls*)	21/28 PCR matched blood culture result
8	Valve material: 15 IE patients (n=12 possible IE, n=3 definite IE†, total n=17 samples); n=13 controls*	14/15 positive (93%) 13/13 controls negative (100%)
9	Valve material: 46 IE patients (n=36 definite IE, n=10 possible IE†); n=25 controls*	24/30 positive
10	Valve material: 8 patients	2/8 positive for organism identified by culture from previous IE
11	Valve material: 98 patients (n=28 definite IE, n=9 possible IE†, n=61 controls*)	PCR: Active group: 12/19 positive, Resolved group: 3/9 positive
12	Valve material: 51 patients suspected IE† (n=52 samples); n=16 controls*	Sensitivity 41.2%, specificity 100%, PPV 100%, NPV 34.8%
13	Valve material: 238 patients (total n=245 samples; n=127 from IE patients – n=98 definite IE, n=29 possible IE†, n=118 controls*) plus B/Cs	Sensitivity 61%, specificity 100%, PPV 100%, NPV 74%
14	Valve material: 147 IE patients† (n=156 valves), B/Cs 3 sets/patient	Group 1: 76/126 positive (60%) Group 2: 11/30 positive (37%)
15	Valve material: 56 IE patients (n=36 definite IE, n=2 possible IE, n=18 rejected IE†) plus B/Cs	Sensitivity 65.8%, specificity 100%, PPV 100%, NPV 58%
16	Valve material: 35 definite IE patients† (n=48 samples); 120 controls* (n=129 samples)	Sensitivity 96%, specificity 95.3%, NPV 98.4% and PPV 88.5%
17	Valve material: n=71 valves from IE patients (42 IE episodes†); n=1,030 valves from controls* (total valves n=1,101)	Valve tissue 34/37 positive
18	Valve material: 74 patients (n=57 definite IE, n=7 possible IE, n=10 rejected†); n=16 controls*	Sensitivity 72%, specificity 100%

Key: B/Cs = blood cultures; PPV = positive predictive value; NPV = negative predictive value; MRSA = methicillin resistant *Staph. aureus*; MSSA = methicillin-sensitive *Staph. aureus*; CoNS = coagulase-negative *Staphylococci*

*Valves replaced due to non-infective indication

†Classified according to the Dukes criteria

Two sets of 16S primers were used in this study: one targeting V3 region and one targeting V4-V7 regions;[4]

Eight patients undergoing valve replacements following a previous episode of IE;[10]

Of the 28 definite IE, 19 had surgery before end of antibiotic treatment – active group, 9 had surgery after antibiotics – resolved group;[11]

Group 1: 126 patients receiving antibiotics at the time of surgery; Group 2: 30 patients with a history of IE who had completed antibiotic therapy before surgery;[14]

PCR performed on all excised valves in first 9 months of study, PCR only performed on valves with a positive culture or on clinical suspicion of IE in remaining 27 months of study[17]

Appendix References

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