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P0080 Broad-range 16S rDNA PCR followed by sequencing: a meaningful method for microbiological investigation of heart valves

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Background: Detection of an aetiological agent from excised heart valves or vegetations is a definite proof of diagnosis of infective endocarditis (IE). However, culture is known to be frequently false negative due to the presence of fastidious bacteria or ongoing antibiotic treatment at the time of surgery. More sensitive PCR is expected to overcome these pitfalls, but positive findings can represent mere persistence of free bacterial DNA and/or bacterial contamination. The aim of the study was to assess the role of PCR in microbiological examination of heart tissues.

Materials/methods: Between April 2014 and October 2017 we investigated 68 heart valve samples from 61 patients with IE. Each sample was examined by culture as well as by broad-range 16S rDNA panbacterial/18S rDNA panfungal PCR kit (Molzym, Germany). The protocol included enzymatic degradation of extracellular DNA prior to the extraction of DNA from lysed bacterial cells to ensure that only viable microorganisms were detected.

Results: Both culture and PCR positive results were evident in eight samples; additional 43 samples were found positive by broad-range PCR only (see Table below). Sensitivity of culture was 16.7% (8/48), while sensitivity of PCR was 100%. Specificity of culture and PCR were 100% and 85% (3 false PCR positives detected), respectively.

Organism	Culture	PCR	Total
Staphylococcus aureus	2	15	15
Coagulase-negative staphylococci	2	5*	4
Enterococcus sp.	1	7	7
Streptococcus pneumoniae	0	1	1
Viridans *streptococci*	0	7	7
Abiotrophia defectiva	1	4	4
Bartonella quintana	0	4	4
Other organisms	2	8*	6
Total	8	51	48

***** Three PCR detections (1x coagulase negative *Staphylococcus*, 2x other organisms) were concluded possible contaminants.

Conclusions: 16S rDNA PCR enabled detection of a broad range of microorganisms including the fastidious ones (*B. quintana, A. defectiva)*. Whereas low recovery rate of culture questions the need and usefulness of culture, a 100% sensitivity of the PCR method advocates its implementation and routine use in the examination algorithm of heart valves.

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