EP038

ePoster Session

Improving molecular diagnosis of blood-borne infections

Broad-range PCR compared to GenoType BaclDent for the detection of pathogens directly from clinical specimens

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Objectives: To compare the usefulness of GenoType BacIdent to detect pathogenic bacteria directly in samples from primarily sterile sites

Methods: The GenoType Bac Ident system uses a DNA-strip technique to detect 14 bacteria with simultaneous detection of mecA, vanA and vanB genes designed primarily to detect blood culture pathogens. We were interested to see if the method was sensitive enough to detect bacteria directly from clinical specimens from sterile sites. All suitable bacteriology specimens were subjected to routine culture, broad- range PCR (targeting 16s/18s sequences) and GenoType. The persons performing each test were blinded to the results of the other tests. The specimens included were: aspirate 133 (65 %), tissue biopsy 52 (25 %) and CSF 21 (10 %).

Results: A total of 206 specimens were investigated between November 2013 and June 2014. GenoType detected a pathogen in 72 (35 %) specimens; culture was positive in 64 (31 %); and the PCR was positive in 39 (19 %) specimens. A total of 33 (16 %) specimens were positive in both GenoType and PCR and 122 (59 %) negative in both. Five specimens (2 %) were positive in the PCR and negative in the GenoType and 38 (18 %) positive in GenoType and negative in the PCR. The sensitivity and specificity for GenoType was 86 % and 76 % respectively. The GenoType results corresponded to culture in 48 positive specimens and 115 negative specimens. Culture was positive in 11 specimens negative in Genotype and in 24 specimens the GenoType was positive with a negative culture result. The sensitivity and specificity of GenoType compared to culture was 81 % and 83 % respectively. Of the discrepant results; in 33 specimens GenoType detected a single pathogen not detected by PCR and in a further 12 specimens more than one pathogen, of which only one (7) or none (5) was detected by PCR. In 3 specimens PCR detected a pathogen not detected by GenoType and in 8 specimens the amplification in GenoType was inhibited. In 6 specimens a pathogen was detected by PCR, which was not included in the GenoType panel. Of 7 culture negative and GenoType positive specimens, 4 were also negative in the PCR.

Conclusion: The GenoType method is both more sensitive in comparison to a broad-range PCR in detecting the 14 bacteria targeted and more sensitive than culture. A limitation of the method is certainly the small range of bacteria targeted, however considering that the technique is designed to identify cultured pathogens, the sensitivity is surprisingly high. A larger multi-centre study may help identify specific pathogens missed by GenoType. The study also demonstrates the relative lack of sensitivity of broad-range PCR using universal 16s and 18s sequences compared to targeted PCR.