Application of Viability PCR using Propidium Monoazide to Detect and Differentiate Live/Dead Methicillin-Resistant *Staphylococcus Aureus* in Clinical Samples

Viability PCR 法を用いた患者検体中の MRSA の生菌検出法の開発

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Summary

Methicillin-Resistant *Staphylococcus aureus* (MRSA) has spread around the world and has become the major cause of life-threatening infections. Viability PCR with chemical Propidium Monoazide (PMA) is an alternative tool to differentiate live and dead bacteria especially in food and environmental samples. In this study, we first tried to adapt and optimize the viability PCR to detect and differentiate live and dead methicillin-resistant bacteria in clinical samples. At first, we assessed the viability PCR in culture medium using antibiotics (gentamicin, vancomycin and linezolid) against MRSA for 24 hours and 12 days. As a result, we confirmed that the viability PCR is an effective tool to assess the effect of antibiotics in vitro. We then assessed the viability PCR using 11 clinical samples. The results indicated that it would be difficult to assess the effect of antibiotics precisely in vivo, but at least it could be possible to judge whether all of the methicillin-resistant bacteria in a clinical sample are dead or not, which is very important to know when to stop antibiotic therapy. The viability PCR assay for clinical purposes would be widely useful, and would contribute to antibiotic therapy for patients with infectious diseases.