

The Application of Molecular Assays in Neonatal Infection

Dr. Hugh Simon Hung-san LAM
Associate Professor
Department of Paediatrics
Faculty of Medicine
The Chinese University of Hong Kong

Bacterial infection remains a major cause of morbidity and mortality amongst neonates. Delayed and/or inappropriate antibiotic treatment could have fatal consequences. The search for biomarkers to accurately diagnose bacterial infection early has therefore been an important area of research. Conventional biomarkers such as C-reactive protein, although widely used, have several limitations, e.g., upregulation several hours after clinical presentation, inability to distinguish between non-infective inflammatory conditions and genuine systemic bacterial infections and inability to derive information that could help rationalise therapy. Newer biomarkers based on inflammatory mediators involved earlier in the inflammatory cascade can achieve earlier detection of bacterial infections. However, despite the possibility of earlier detection of systemic inflammatory conditions which include bacterial infection, it is still challenging to determine specific information regarding the pathogen, e.g., bacterial identity and antibiotic resistance patterns. With molecular assays, e.g., polymerase chain reaction-based tests, it has become possible to detect Gram-negative bacteria and their antibiotic resistance patterns within hours of clinical presentation. These novel biomarkers and molecular assays can potentially improve outcomes of these infected neonates.