

Higher IL-6 in saliva predicts bacterial infection in premature infants

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Background:

Bacterial infection can lead high morbidity and mortality in neonates. It has been ascribed to the immaturity of their immune system. The clinical symptoms and signs of bacterial infection in neonates were subtle and nonspecific. Thus, to early detect severe bacterial infection in neonates remains a significant clinical challenge for health care providers. As so far, the definite diagnosis of bacterial infection in neonates is positive culture result which might need 5-7 days. Procalcitonin and inflammatory cytokines in blood has been reported to be associated with bacterial infection in neonates. However, series blood exam are limited in neonates especially in premature babies due to their small blood volume.

Objectives

Our aim in this study was to investigate salivary cytokines in premature babies with bacterial infection and to find out a method in the purpose to reduce frequent blood test in them.

Methods

In this prospective study, 150 premature infants in neonatal intensive care unit at Kaohsiung Chang Gung Memorial Hospital from Aug. 2012 to Dec. 2013 were enrolled. Cases such as congenital anomalies, bronchopulmonary dysplasia, necrotizing enterocolitis, TORCH (Toxoplasmosis, Others, Rubella, Cytomegalovirus, and Herpes) infection or any surgical indicated diseases were excluded. Saliva samples were collected since the seventh day after birth, then once a week and whenever clinically suspected sepsis. The time of each salivary collection was scheduled regularly at 7:00 AM before oral feeding. The levels of TNF- α , IL-6, IL-8, MIP-1 α , MIP-1 β , and IFN- γ in saliva were measured by Luminex bead array.

Results

Within these 150 patients, twelve cases had 16 episodes of bacterial infection which were defined as growing of bacteria either in blood, sputum or urine culture. IL-6, MIP-1 α and MIP-1 β in saliva were significantly higher in culture-positive group than culture-negative group as calculated by Mann-Whitney U-test. Furthermore, IL-6 had greater area under the receiver operating characteristic curve than MIP-1 α and MIP-1 β to differentiate culture-positive from culture-negative group.

Conclusions

Our study unraveled the presence of higher IL-6, MIP-1 α and MIP-1 β in saliva that was associated with bacterial infection in premature babies. And IL-6 might be a useful biomarker to predict bacterial infection in premature neonates. Salivary cytokine exam is a non-invasive and novel method to detect the occurrence of bacterial infection in premature infants. Thereby, frequent blood exam could be reduced and thus lowering the occurrence of anemia in them.