Procalcitonin - a valuable diagnostic marker in meningococcal disease

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Background: Some patients with meningococcal disease (MCD) seeking medical attention create a diagnostic dilemma for clinicians due to the non-specific nature of their presentation. We have assessed the diagnostic accuracy of procalcitonin within the emergency department (ED), to clarify its role in the evaluation of MCD.
Methods: Two overlapping cohorts have been studied. Procalcitonin levels were measured in a cohort of patients with confirmed MCD diagnosed within the current New Zealand serogroup B epidemic, to assess the sensitivity of procalcitonin. In the second cohort, a large consecutively recruited ED population of febrile patients, enabled specificity and likelihood ratios of procalcitonin to be evaluated.
Results: There were 193 patients in the MCD cohort (92 children, 101 adults). The procalcitonin geometric mean was 10.9ng/ml with higher childhood than adult values (22.9ng/ml vs 5.5ng/mL, p=0.01). The overall sensitivity of procalcitonin, using a 2.0ng/ml cut-off in children and 0.5ng/ml for adults, was 94% (95% CI 89-97%). Despite the higher paediatric cut-off, a trend towards greater procalcitonin sensitivity existed in children (96% vs 92%, p=0.30). Procalcitonin was correlated with whole blood meningococcal load (r=0.50) and Glasgow Meningococcal Septicaemia Prognostic Score (r=0.40). Within the cohort of 1521 febrile ED presentations, 28 patients were confirmed to have MCD. We showed a procalcitonin specificity in MCD of 85% (95% CI 83-87%), positive and negative likelihood ratios of 6.1 and 0.08, and corroborated the sensitivity of procalcitonin (93%; 95% CI 76-99%).
Conclusions: Procalcitonin can provide an important tool in the diagnosis of patients with MCD who present with non-specific febrile illnesses. The diagnostic accuracy surpasses current early laboratory markers and can be used to guide patient management decisions.