Commentary

Procalcitonin: seeking a niche

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Abstract

For over a decade there has been intense interest given to the role of procalcitonin in the diagnosis and management of sepsis in critically ill patients. Early opinions strongly supported the diagnostic role but data accumulating from numerous subsequent studies are less supportive, even when used in very selective settings. Although there remains sufficient reason to support the use of procalcitonin in guiding antibiotic therapy or perhaps providing prognostic information, it may be time to focus our efforts on the early diagnosis of sepsis in the critically care setting on alternative, more promising methods.

Procalcitonin (PCT) has a fascination for many critical care physicians. There exists the desire for reliable biomarkers of sepsis; however, physicians are divided in opinion as to the usefulness of this particular candidate. The study by Brodska and colleagues published in the previous issue of *Critical Care* is small, yet illuminating, searching to advance the debate by evaluation of the behaviour and diagnostic role of PCT in patients undergoing allogenic haematopoietic stem cell transplantation, and who receive antithymocyte globulin as part of the conditioning regimen [1]. Lacking indices such as a white cell count to assist in determining whether sepsis has occurred, the authors undertook a prospective trial to ascertain the diagnostic values of PCT and C-reactive protein in this very specialised situation. Marked and rapid elevations of both C-reactive protein and PCT blood levels followed antithymocyte globulin administration and performed inadequately as markers for subsequent sepsis. It is probable that the PCT was released from nonendocrine parenchymal tissues throughout the body [2].

The story of PCT as a diagnostic marker in sepsis is an unfinished story. Multiple studies undertaken over the past decade have resulted in conflicting results, and the heterogeneity of studies pose major challenges in arriving at a consensus. This heterogeneity is expressed at several levels; including experimental animal models that may vary from endotoxin infusion to caecal ligation and puncture, methods by which the diagnosis of sepsis and the nonseptic state in humans are made, incomparable control groups, location of septic foci and organism type, analytical methods used for serum PCT levels, and the uncertainty of blood sampling in regard to onset of infection. Such study complexity led to the question of whether meta-analysis and systematic review would help. Even here, the heterogeneity, as described above, limits the power of any meta-analysis. There is value, however, in reviewing multiple studies in this manner in an attempt to elucidate appropriate use of PCT in everyday clinical settings, even if the results do not provide support for its use as an unequivocal marker of sepsis [3].

It could be argued that the strongest data available defy a clear and accurate diagnostic role for PCT, but there is good evidence to support a role in guiding the duration of antibiotic therapy in patients with confirmed sepsis. Perhaps further studies using more recently developed PCT assays, which are more sensitive, may change this situation [4]. It is also possible that large trials currently underway will resolve much of the debate but, once again, the matter of heterogeneity will need to be closely examined [5]. The lack of diagnostic efficacy PCT demonstrated in the very selective group of patients by Brodska and colleagues does not resolve the major question: does PCT accurately diagnose the presence of infection? More provocatively, there is another question that should be asked – whether the time, money, and effort put into defining the role of PCT may be better spent on more promising areas of biomarker research such as genomics.

Competing interests

The author declares that he has no competing interests.

PCT = procalcitonin.

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