Procalcitonin (PCT) is a peptide precursor of calcitonin that is released by parenchymal cells in response to bacterial toxins, leading to elevated serum levels in patients with bacterial infections; in contrast, procalcitonin is down-regulated in patients with viral infections. The dual function of PCT as a precursor peptide from the hormone calcitonin and a cytokine mediator, which is elevated upon systemic bacterial infections in line with other cytokines, has led to the term "hormokine" mediator.

PCT shows an earlier increase upon infection and a more rapid decrease when the infection is controlled by the immune system supported by antibiotic therapy. PCT correlates with the extent and severity of infection and has prognostic implications, as the course of PCT predicts the risk for mortality in critically ill patients with infections and in patients with ventilator-associated pneumonia (VAP). Furthermore, the production of PCT, in contrast to other biomarkers including C-reactive protein (CRP), seems not to be significantly attenuated by non-steroidal and steroidal anti-inflammatory drugs.

The efficacy and safety of PCT-guided decision-making regarding antibiotics has been demonstrated in 14 randomized controlled trials in different clinical settings and including infections of varying severity. A diagnostic algorithm has been proposed by Schuetz et al, regarding the guidance of antibiotic therapy in different clinical settings and with different cut-off points of procalcitonin. In this algorithm, the patients are categorized in 3 groups of risk: A: Low risk, non pneumonic respiratory infections, B: Moderate risk, pneumonic infections in the emergency department and inpatients, C: High risk, sepsis in need of intensive care unit admission. For group A patients, initiation or continuation of antibiotics is strongly discouraged or discouraged respectively, for cut-off points <0.1 μg/l and <0.25 μg/l respectively. For cut-off points ≥0.25 μg/l and >0.5 μg/l, antibiotics are encouraged and strongly encouraged respectively. For group B patients, the recommendations of the algorithm are the same as for group A patients. For group C patients, empirical antibiotics are recommended for all patients irrespectively of the PCT value (Table 1).

Levels of serum procalcitonin, using the same algorithm, were also used to determine follow-up decisions. In group A patients, follow-up procalcitonin measurements within 1-2 days are recommended only in case of non-resolving or worsening symptoms. An increase of ≥0.25 μg/l
In a recent meta-analysis of four studies with a total of 760 patients, aged 65 years and older, Lee et al. evaluated the diagnostic accuracy of procalcitonin for the identification of systemic bacterial infections in elderly patients.

The results showed that, procalcitonin test is both specific and sensitive in the diagnosis of severe bacterial infection in elderly patients while leukocytosis is a specific

favor the use of antibiotics. In group B patients already on antibiotics, discontinuation of antibiotic treatment is strongly encouraged for procalcitonin levels of <0.1 μg/l and encouraged for levels <0.25 μg/l, at follow-up. For cut off-points ≥0.25 μg/l and >0.5 μg/l, discontinuation of antibiotics is discouraged and strongly discouraged respectively. In group C patients, discontinuation of antibiotic treatment is strongly encouraged if procalcitonin levels drop to <0.25 μg/l or in case of a >90% drop of the initial value at follow-up; encouraged for a cut-off point of <0.5 μg/l or a >80% drop, discouraged when procalcitonin levels are ≥0.5 μg/l and strongly discouraged for a cut-off point of ≥1.0 μg/l. Importantly, the algorithm can be over-ruled in case of clinical instability or patients at risk of adverse outcome (immunocompromised or high PSI score).

The decline in immune function often observed in elderly patients results in atypical and frequently subtle (e.g. mild fever or even apyrexia) clinical presentations of bacterial infection in older people. J Am Geriatr Soc 1996;44:927-933.

**REFERENCES**


