

Procalcitonin-Guided Antibiotic Therapy in Severely Critically Ill Patients



The controversy surrounding the efficacy of the blood infection biomarker, procalcitonin (PCT), for guidance in acute infections and sepsis treatment remains. PCT is a calcitonin precursor produced by epithelial cells when infected with bacteria and has been identified as a marker due to the protein levels' variation upon infection initiation and cessation.

To resolve debates over its use, a new study has assessed meta-analysis results where antibiotic use has been guided by PCTs. Researchers used relevant literature and randomised controlled trials (RCTs), to assess the primary outcome: short-term mortality as a result of PCT use. The secondary outcomes of the study included the length of antibiotic treatment, ICU stay duration and hospital stay duration.

16 RCTs covering 6452 ICU patients were used during the study. The results showed similar short-term mortalities and hospital/ICU stay durations for both PCT-guided and standard antibiotic therapies. However, the antibiotic length was found to be reduced by 0.99 days for PCT-guided therapy, this was found to be the same for PCT-guided initiation of antibiotic therapies and also for mixed strategies.

Short-term mortality was found to be reduced in the PCT-guided cessation of antibiotics for patients with a Sequential Organ Failure Assessment (SOFA) score of less than 8 when compared to the standard care subgroup. Whereas the short-term mortality was found to be similar in the subgroup of patients with a SOFA score of greater than 8 and the sepsis subgroup. It was, therefore, suggested that PCT-guided antibiotic therapies could suit patients without multiple organ failure in the general ward population or the emergency department. Concerns were raised on the accuracy of the SOFA subgroups as there may have been overlapping scores due to the average score being used.

Researchers also found that systemic inflammatory response syndrome (SIRS) or other types of organ dysfunction may increase PCT levels. Therefore, there is a need to assess PCT-testing combined with strategies to manage sepsis.

Overall the results showed that the PCT-guided cessation of antibiotics was successful in improving short-term mortality results for sepsis patients, however, there was no significant effect on short-term mortalities for PCT-guided initiation or mixed cessation. Also, although there was a reduction in antibiotic course duration when it was guided by PCT, researchers emphasised that this result is based on the comparison with the mixed strategies subgroup and the subgroup with a SOFA score of greater than 8. Additionally, there was no impact on the duration of stay in either the ICU or the hospital. It was concluded that these results are a result of PCT-based prescribing guidelines not allowing for much change when it comes to making decisions about antibiotic treatment.

Source: [International Journal of Infectious Diseases](#)

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