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Diagnostic Accuracy of Procalcitonin in Differentiating Sepsis from Noninfectious SIRS in Adult Patients with Subarachnoid Hemorrhage

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CTR Abstract

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Background: Subarachnoid hemorrhage (SAH) is a frequent diagnosis in the neuro-intensive care unit (NICU) that can result in the development of systemic inflammatory response syndrome (SIRS) and fever. The differentiation between central fever and infectious fever is paramount in order to prevent superfluous diagnostic testing and overuse of empiric antibiotics.

Methods: A prospective chart review study conducted in the NICU between December 2012 and September 2015. Patients with SAH, fever (≥101.0°F) and/or who were SIRS positive and had PCT levels measured were included. The primary outcome was clinical infection defined as any positive culture or infiltrate on chest X-ray within three days of onset of fever.

Results: Out of 129 patients, 54 were positive for any culture: 14 with PCT ≤0.2, 12 with PCT >0.2 and ≤0.5, and 28 with PCT >0.5. Using multiple logistic regression, PCT between 0.2-0.5 had an odds ratio of 2.99 (95% CI 1.12-8.00) while PCT >0.5 had an odds ratio of 29.11 (CI 8.49-99.83) and p-value of <0.001. All other predictors were not statistically significant. For procalcitonin >0.5, specificity is 94.7%, sensitivity 51.9%, positive predictive value 87.5%, and negative predictive value 73.2%. ROC Curve area: 79.3%.

Conclusion: PCT of 0.5 ng/mL or greater was useful for distinguishing infectious from central fever in SAH patients, with PCT values between 0.2-0.5 as somewhat predictive of infection. The test has high specificity and a reasonably high negative predictive value, so it can be a valuable tool to rule out infectious fever in patients with SAH.