P31
Procalcitonin-guided antibiotic therapy in patients with congestive heart failure and suspicion of lower respiratory tract infection: results from a randomized trial
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Introduction Differentiation of acute heart failure from infection in patients with respiratory symptoms and a history of congestive heart failure (CHF) is challenging due to overlap of clinical symptoms and X-ray findings. The BACH study found higher mortality rates if patients presenting with dyspnea were treated with antibiotics and their procalcitonin (PCT) levels were low indicating absence of bacterial infection. Yet the BACH study was observational and causal inference cannot be drawn. Herein, we analyzed the effects of PCT-guided antibiotic stewardship in CHF patients from a previous trial (PROHEP).

Methods This is a secondary analysis of a previous randomized trial of adult ED patients with respiratory symptoms and a history of CHF. Patients were randomized to administration of antibiotics based on a PCT algorithm (PCT group) or standard guidelines without knowledge of PCT levels (control group). The primary endpoint of this analysis is the risk of adverse outcome defined as death or ICU admission within 38 days after ED admission.

Results A total of 213 patients met the inclusion criteria, with 116 in the PCT-guided group and 117 in the control group. In the subgroup of patients with low initial PCT levels (<0.25 ng/l) (n = 110), PCT-guided patients had a significant reduction in antibiotic exposure (mean 3.7 vs. 6.5 days, difference -2.8, 95% CI -4.4, -1.2, P < 0.001). Furthermore, PCT-guided patients had a significant lower risk for death and ICU admission (HR 0.6, 95% CI 0.2-0.6, P = 0.02). See Figure 1. Conclusion In CHF patients with suspicion of respiratory infection, use of a PCT protocol resulted in a significant decrease of antibiotic exposure and significantly improved outcomes in patients with low PCT levels indicating absence of bacterial infection. Whether inadequate antibiotic therapy in these CHF patients requiring diuretic treatment explains this difference in clinical outcomes needs verification.

Figure 1 (abstract P31). Time to a adverse outcome according to group allocation.

Methods In this prospective cohort study, 39 patients undergoing cardiac surgery using CPB were included. Blood was collected before surgery (T0), after induction of anesthesia (T1), after termination of CPB (T2), at ICU arrival (T3) and 3 hours (T4), 6 hours (T5) and 18 hours (T6) after arrival. Pro-ADM was measured with a sandwich immunoassay.

Primary endpoints were length of ICU and hospital stay (ICU-LOS, hospital-LOS).

Results An increase of arterial and venous pro-ADM plasma concentrations was observed after surgery. Immediately after termination of CPB the venous concentration was significantly lower than arterial pro-ADM concentration, but at T5 the venous concentration was significantly higher, indicating a switch from a negative to positive transpulmonary gradient (Figure 1). The pre-ADM versus-arterial difference at T5 was a significant predictor of ICU-LOS (p = 0.032) and the difference at T3 was a significant predictor of hospital-LOS (p = 0.001).

Conclusion We found that the transpulmonary gradient of pro-ADM was a predictor for ICU-LOS and hospital-LOS at T3 and T5, respectively. Pro-ADM might be a promising marker for prediction of outcome of patients undergoing cardiac surgery on CPB. The transpulmonary shift of pro-ADM might be caused by an inflammatory response.

References

P32
Pro-adrenomedullin as prognostic biomarker in the sepsis
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Introduction Pulmonary complications after cardiac surgery like ARDS are frequent and linked to mortality [1]. Pro-adrenomedullin (pro-ADM) has a possible role in the development of ARDS [2] and a positive correlation between levels of pro-ADM and inflammation was found [3]. In this study, we investigated whether preoperative and postoperative pro-ADM transpulmonary gradient could predict postoperative morbidity.

Figure 1 (abstract P32). Pro-ADM transpulmonary gradient at different time points.

Methods In this prospective cohort study, 117 patients > 18 years with severe sepsis according to the Surviving Sepsis Campaign, in an ICU of a university hospital. Demographic, clinical parameters and proADM, C-reactive protein and procalcitonin were studied during 1 year. Descriptive and comparative statistical analysis was performed using the statistical software package Stata 11.2 and MedCalc 9.21.6.

Results We analyzed 117 consecutive episodes of severe sepsis (15%) or septic shock (85%) in the ICU. The median age of the patients was 57 years (IQR 44–66) with an APACHE II score of 18 (IQR 13–22).

Conclusion The highest levels of pro-ADM were observed in the first 24 hours after surgery, significantly higher in patients with complications (547.5 ± 637 vs. 167.6 ± 84 ng/ml, P = 0.02) and a positive association with the transpulmonary gradient of pro-ADM was found (r = 0.24, P = 0.03).
64 (interquartile range, 53 to 72) years; the main sources of infection were respiratory tract (46%) and intra-abdominal (21%). The 28-day mortality was 33.2%. The profile of death patients had a significantly higher average age (64.7 vs. 57.6 years; P = 0.024), as well as poorer clinical variables: APACHE II (29.6 vs. 23.3; P = 0.006) and SOFA (11.6 vs. 8.9; P < 0.001). Kaplan-Meier survival analysis was also conducted; the probability of survival for patients with PaO2/FiO2 < 120 mmHg at 7 days was 57%, 44%, and 38% at 14, 21, and 28 days, respectively. Cox regression analysis also showed statistical significance (P = 0.003) and a likelihood ratio of 1.18 per each 1 mmol increase in PaO2.

Conclusion: N-cresyl-protein in pADM is an important prognostic biomarker of survival when measured on admission of septic patients to the ICU.

References:

PS4
Early IL-6 response in sepsis is correlated with mortality and severity score
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Introduction: IL-6, a proinflammatory cytokine, is synthesized from fibroblasts, T lymphocytes, endothelial cells and monocytes. It serves as an important mediator during the acute phase response to inflammation in sepsis. We hypothesized that the plasma IL-6 correlates with mortality and severity scores in critically ill patients with sepsis.

Methods: Plasma IL-6 levels were measured at the initial phase of sepsis and the risk of mortality. A total of 293 patients with sepsis, who were admitted to the medical ICU at Phramongkutklao Hospital, Bangkok during January to December 2011, were analyzed. Serum IL-6, C-reactive protein (CRP), and lactate were measured within the first 24 hours of ICU admission. Severity scores (APACHE II, SAP II, and SOFA scores) were measured. The primary outcome variable was 28-day all-cause mortality.

Results: We found that overall the 28-day mortality was 56% (93 out of 203 patients). There was a significantly positive correlation between mortality rate and plasma IL-6 (survivors vs nonsurvivors, 74 (4.4) vs 1,718) (P = 0.001). Lactate (survivors vs nonsurvivors, 3.65 (0.7) to 11.63) vs 2.47 (0.94 to 19.13) mmol/L (P < 0.05), but not CRP levels (P = 0.24). Compared with the patients with plasma IL-6 < 100 pg/ml, septic patients with IL-6 levels > 100 were associated with an increased 28-day mortality with an odds ratio of 2.94 (CI 1.42 to 6.29; P < 0.05). We also found that plasma IL-6 levels were well correlated with APACHE II (P < 0.05), SAPS II (P < 0.05), and SOFA (P < 0.05) scores.

Conclusion: The initial phase plasma IL-6 levels were correlated with severity and mortality in critically ill patients with sepsis.

References:

PS5
Compared values of presepsin (cD14-ST) and procalcitonin as early markers of outcome in severe sepsis and septic shock: a preliminary report from the Albanian Italian Outcome Sepsis (ALIBIOS) study
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Introduction: The level of presepsin is useful for differentiating sepsis from noninfectious systemic inflammatory response syndrome. It has been previously reported that the presepsin levels in patients with chronic renal failure are abnormally high. However, there are no studies investigating the usefulness of presepsin for diagnosis of sepsis in patients with acute kidney injury (AKI). Our purpose of this study is to clarify the diagnostic accuracy of presepsin in patients with sepsis and AKI.

Methods: This study was conducted as a single-center retrospective study. Blood samples were collected from patients admitted to the emergency room at Fukuda University Hospital between June 2011 and October 2012. We enrolled 254 patients with suspected sepsis and other disease patients. We classified the patients into an AKI group according to the RIFLE criteria: (Risk n = 25, Injury n = 29, Failure n = 41, Loss of kidney function and End-stage kidney disease n = 7) and a non-AKI group (n = 115). The AKI patient group was further classified into a sepsis group and a nonsepsis group in each AKI stage.

Results: For the non-AKI patients, the median of presepsin in patients with nonsepsis (n = 78) and the sepsis group (n = 37) were 406 pg/ml (range: 86 to 4,734) and 1,065 pg/ml (range 86 to 9,950), respectively (P < 0.0001). For the patients with AKI, the median of presepsin in patients with nonsepsis (n = 25) and the sepsis group (n = 27) were 299 pg/ml (range: 71.2 to 3,361) and 831 pg/ml (range: 233 to 6,759), respectively (P < 0.001). For the Injury group, median of presepsin in patients with nonsepsis (n = 12) and the sepsis group (n = 27) were 463 pg/ml (range: 122 to 1,197) and 1,451 pg/ml (range: 237 to 4,200), respectively (P < 0.001). For the Failure group, median of presepsin in patients with nonsepsis (n = 12) and the sepsis group (n = 27) were 463 pg/ml (range: 122 to 1,197) and 1,451 pg/ml (range: 237 to 4,200), respectively (P < 0.001).