ABSTRACTS

Combined Critical Care and Thoracic Societies Congress – Critical Care abstracts

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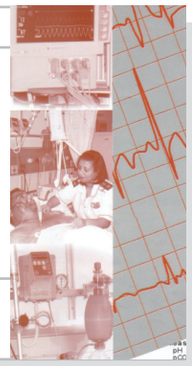

ANTIBIOTIC PRESCRIPTION PRACTICES AND THEIR RELATIONSHIP TO OUTCOME IN INTENSIVE CARE UNITS IN SOUTH AFRICA

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Introduction. Antibiotic prescription practices are extremely variable in both the public and the private sectors in South Africa.

Objective. To review antibiotic prescription practices in the public and private sectors in South Africa.

Design. As part of prospective national 1-day sepsis prevalence study (PISA), a proportional probability sampling technique was applied to a national database to select 43 ICUs. Empiric antibiotic prescription practices were reviewed by two independent intensivists. This included the appropriateness of empiric antibiotic prescription, post-culture antibiotic modification and the impact of appropriate choice and duration of antibiotic use on mortality.

Results. One hundred and eighty patients (N=248) required empiric antibiotic prescription. The choice of antibiotic was appropriate in 39.2%(47/120) and 56.5% (35/62) of patients in the private and public sectors, respectively. Mortality was significantly increased with an inappropriate choice of empiric antibiotic (12.2% v. 28%, N =180, p=0.01). Post culture antibiotic de-escalation was appropriate in 23.9% (21/88) of patients. The duration of therapy was inappropriate in 20.8% (25/120) and 41.9% (26/62) of patients in the private and public sectors, respectively. Inappropriate duration of antibiotic prescription was not associated with an increase in mortality (p=0.42).

Comment. Antibiotic prescription practices in both the public and the private sector are concerning. Inappropriate antibiotic choice impacts on patient outcome.

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THE CLINICAL OUTCOME OF INFECTIONS DUE TO EXTENDED-SPECTRUM BETA-LACTAMASE-PRODUCING (ESBL) ENTEROBACTERIACEAE

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Introduction. β-lactamase production remains the most important mechanism of antibiotic resistance in Gram-negative pathogens as exemplified by the extended-spectrum β-lactamases (ESBLs). The most frequent carbapenemases are the *K. pneumonia* KPC which are increasingly prevalent worldwide.

Objective. To determine the clinical outcome of patients with infections due to ESBL-producing enterobacteriaceae.

Methods. This prospective observational, clinical and laboratory-based study was performed at CMJAH, from July 2006 through 2007. Selected ESBL culture-positive patients were included and the significance of the isolates was confirmed by the presence of features of sepsis. Patients with repeat isolates collected within 2 weeks of the primary infection were excluded. Demographics, clinical, co-morbid disease, laboratory parameters, whether community or hospital-acquired, duration of hospital stay and clinical outcome were recorded. The choice, dose, dosage interval, method of administration and duration of antibiotics were recorded. Carbapenems and fluoroquinolones (if confirmed to be susceptible) were considered to be appropriate therapy for ESBLs.

Microbiology. The ESBL producers were determined by phenotypic analysis using extended-spectrum β-lactamase (ESBL) detection discs, and MICs of imipenem, meropenem and ertapenem were established. Specimens were screened by the modified Hodge test for carbapenemases (KPC-type).

Results. 22 patients with a median age of 59 were included. 13 (59%) died and of these, 9 (69%) received inappropriate treatment. Of the 9 survivors, 7 received ertapenem and 2 meropenem. All had one or more catheters inserted, 14 (63%) were admitted to the ICU and all the ESBLs were hospital acquired. No KPCs were identified. 16 had additional organisms isolated from other sites or the same site but at different times.

Conclusion. Mortality of patients infected with ESBL-producing enterobacteriaceae is high, but in those treated appropriately with a carbapenem, including ertapenem, outcome is good. In those admitted to the ICU, multiple organisms are highly likely and MRSA and *Pseudomonas* cover is recommended.

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SOLUBLE TRIGGERING RECEPTOR EXPRESSED ON MYELOID CELLS (S-TREM-1) FROM ENDOTRACHEAL ASPIRATES IN CRITICALLY ILL PATIENTS: A POTENTIAL MARKER OF THE DYNAMIC INFLAMMATORY BURDEN OF THE LOWER RESPIRATORY TRACT

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The current study was designed to evaluate the role of soluble triggering receptor expressed on myeloid cells (s-TREM-1) measured in samples of endotracheal aspirates from

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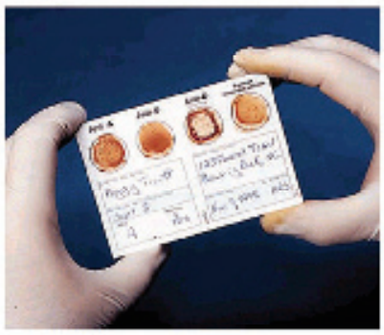

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critically ill, intubated patients as a marker of inflammation or pneumonia. The Clinical Pulmonary Infection Score (CPIS), a commonly utilised clinical predictor of ventilator-associated pneumonia (VAP), was calculated for each patient at the same time that endotracheal aspirates were obtained using sterile techniques, to correlate this with measured s-TREM-1 concentrations. The CPIS is derived from clinical and laboratory variables including temperature, leukocyte count, PaO_2/FiO_2 ratio, radiographic infiltrates and microbiological culture of aspirates, while s-TREM-1 was determined in the laboratory using a validated ELISA procedure.

Thirty patients (2 - 39 days in ICU) were included in the study. Soluble-TREM-1 was detectable in endotracheal aspirates from all patients and a wide range of concentrations from 13 to >4 000 pg/ml was observed. The mean s-TREM-1concentrations for patients with a CPIS <6 (*N* =15) compared with those with a CPIS ≥6 were 592 ± 288 and 382 ± 119 pg/ml, respectively ($p>0.05$).

The results of this pilot study demonstrate that s-TREM-1 is readily detectable and quantifiable in endotracheal aspirates from critically ill patients, but does not correlate with the CPIS. The wide range of measured s-TREM-1 concentrations suggests that this pro-inflammatory marker may reflect the dynamic inflammatory burden of the lower respiratory tract increasing progressively as colonisation by microbial pathogens leads to ventilator-associated tracheobronchitis (VAT) and ultimately VAP. Therefore, serial determinations of s-TREM-1 in this setting may be of greater value than the CPIS in differentiating VAT from VAP and thus provide an alternative threshold for the initiation of empirical antimicrobial therapy.

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RENAL FUNCTION AS PREDICTOR OF 5-YEAR OUTCOME IN ACS PATIENTS – A RETROSPECTIVE ANALYSIS

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Aims. Acute coronary syndrome is a prevalent diagnosis in the population of the secondary-level Karl Bremer Hospital. Risk factors for the development of this disease are well known. Risk factor stratification models have, until recently, omitted presenting renal function to their models. Also, recent models have only looked at outcomes up to 6 months.

Methods and results. We have evaluated a cross sectional group of patients (*N* =199) with the diagnosis of acute coronary syndrome and compared the renal function of the alive versus the deceased group at 5 years. Our deceased population had an older mean age (71.6 v. 56.6) than the alive group. As expected, they also had significantly higher rates of known hypertension (80.3% v. 57.7%) and diabetes mellitus (28.9% vs. 24.4%) than the alive group. The deceased group had a significantly higher rate of heart failure compared with the alive group (53.9% v. 18.7%). We also found that a higher percentage of patients in the deceased group had impaired renal function compared with the alive group (eGFR <90 ml/min 85.5% v. 37.4%; proteinuria 36.9% v. 22.0%; microalbuminuria 22.4% v. 4.9%). In the deceased group the degree of renal impairment was more advanced compared with the alive group (eGFR 58.8 ml/min v. 99.1 ml/min).

Conclusion. Renal dysfunction is a common and important co-morbid condition in patients with acute coronary syndrome in our population and may be an underestimated predictor of adverse 5-year outcome.

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CIRCULATING ACUTE PHASE REACTANTS, PROCALCITONIN AND STREM-1 AS ADJUNCTS TO A CLINICAL SCORING SYSTEM IN THE DETECTION OF INFECTION AND PREDICTION OF OUTCOME IN CANCER PATIENTS WITH FEBRILE NEUTROPENIA

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Introduction. Cancer patients receiving chemotherapy often develop febrile neutropenia and are at high risk for development of bacterial or fungal infections, which are the major cause of morbidity and mortality in these patients. Immediate hospitalisation with rapid administration of broad-spectrum antimicrobial agents is the standard management for these patients. However, in neutropenic patients, fever can be caused not only by infection but also by non-infective causes. In this setting, there is a critical requirement for the development of strategies, such as the Multinational Association of Supportive Care in Cancer (MASCC) risk-index score, which enable early identification of patients at high risk of serious infective complications.

Aim. The aim of the current study was to identify host-derived, systemic markers of inflammation/infection which, either individually or in combination, can be used to distinguish between infective and non-infective causes of pyrexia in cancer patients, as well as to predict outcome in patients with chemotherapy-induced neutropenia.

Methods. 48 patients with a confirmed malignancy, presenting with febrile neutropenia as a result of chemotherapy, were recruited. CRP and SAA were measured by immuno-nephelometrye, procalcitonin was assayed using an immunoluminescence procedure, and s-TREM-1 levels were determined by ELISA.

Results. Categorising the patients into low-risk and high-risk according to the MASCC scores CRP, SAA, PCT and s-TREM-1 were significantly elevated in the high-risk group. CRP, SAA and PCT also inter-correlated with each other, while sTREM-1 correlated significantly with PCT only. Good correlations were also detected between the MASCC scores and PCT as well as s-TREM-1.

Conclusion. Although these results are from a small single-centre study, procalcitonin as well as s-TREM-1 seem to be of value as an adjunct to a clinical scoring system such as the MASCC.

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