Poster

[P25-2] P25-2: Anti-infective drugs (2): Beta-lactams

Chair: Veronique Stove, Belgium

Mon. Sep 25, 2017 12:30 PM - 1:30 PM Annex Hall (1F)

(Mon. Sep 25, 2017 12:30 PM - 1:30 PM Annex Hall)

[P25-2-8] Broad spectrum beta-lactam antibiotic levels in critically ill Asian patients

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Keywords: Meropenem, Piperacillin, Intensive Care Unit, Therapeutic Drug Monitoring

Background

Achieving pharmacodynamic (PD) targets of free antibiotic concentrations above minimum inhibitory concentration (f T>MIC) of 50% and 100% of the dosing interval is important in critically ill patients. However, high levels increase risk of neurotoxicity. We investigated the likely PD exposures in our patients.

Methods

Two blood samples were obtained (at 50% and 75-100% of dosing interval) from intensive care unit patients who were started on piperacillin-tazobactam and meropenem. CLSI breakpoints against *P. aeruginosa* were used. Doses were determined by the ICU team according to patient’ s renal function and no extended infusions were used. Patents with meropenem levels 50 mg/L and piperacillin-tazobcatam 100 mg/L at 75-100% of dosing interval were considered at risk of neurotoxicity.

Results

Twenty-one patients were included in the study. 57% were Chinese, 24% were Malay and 14% were Indians. 17 (81%) patients received meropenem while 4 (19%) received piperacillin-tazobactam. Median age (inter-quartile range) and weight were 72 (65-77) years and 56 (50-62) kg respectively. 52% of the patients had respiratory source of infection and the median APACHE II score was 20 (14-25). 14-day mortality was 9.5%. 76% (16/21) and 33% (7/21) were on mechanical ventilation and inotropes respectively. 2 patients were on continuous renal replacement therapy (CRRT). Among those not on CRRT, 8/18 (44%) had creatinine clearance of <30 ml/min with a mean of 46 ±45 ml/min.

Mean meropenem levels were 28 ±24 mg/L and 21 ±24 mg/L at 50% and 75-100% of dosing interval and mean levels of piperacillin-tazobactam were 67 ±60 mg/L and 60 ±61 mg/L respectively. 90% (17/19) and 71% (12/18) achieved fT>MIC of 50% and fT>MIC of 75-100% respectively. All patients who received meropenem (15/15) achieved PD targets, compared to 50% of patients receiving piperacillin-tazobactam (2/4). 77% (10/13) who received meropenem achieved PD targets compared to 50% (2/4) of patients receiving piperacillin-tazobactam. One patient on meropenem and 1 patient on piperacilin-tazobactam had levels that were at risk of neurotoxicity at 75-100% of dosing interval.

Conclusions

Therapeutic drug monitoring may be needed to achieve optimal antibiotic levels and reduce risk of neurotoxicity.