MEROPENEM THERAPY OPTIMIZATION BY TDM: OUR EXPERIENCE

Dott.ssa ALESSANDRA BATTEZZI (1), Dott.ssa LAURA PARISELLA (1), Dott. ERMAL RICA (1), Dott. DANIELE ORSO (1), Dott.ssa MANUELA LUGANO (1), Dott.ssa SERENA TOMASINO (1), Dott. FEDERICO PEA (2), Prof.ssa TIZIANA BOVE (1)

(1) Clinica di Anestesia e Rianimazione, Azienda Sanitaria Universitaria Integrata di Udine, Udine, Italia.
(2) Istituto di Farmacologia Clinica, Azienda Sanitaria Universitaria Integrata di Udine, Udine, Italia.

Argomento: Funzione renale e metabolica in terapia intensiva

BACKGROUND
Meropenem is a time-dependent bactericidal carbapenem antibiotic, widespread in intensive care units (ICUs) for the treatment of severe gram-negative infections. Several studies demonstrated that continuous infusion administration could be the best way to prolong the T>MIC and improve antibacterial activity.[1-4] Therapeutic drug monitoring (TDM) is a useful strategy to minimize toxicity and maximize efficacy of this type of antibiotic.[5]
Aim of this study was to evaluate the optimization of meropenem continuous infusion dosage by TDM use.

METHODS
We retrospectively analyzed data of septic patients admitted to our ICU from July to December 2017 treated with meropenem. We collected microbiological data, serum creatinine levels, calculated creatinine clearance (CLcr), meropenem therapy duration, empiric or microbiological-targeted indication, variation on TDM, 30-day outcome.
According to the antimicrobial stewardship protocol of our institution, meropenem is given with a 2 grams loading dose followed by 4grams/24h by continuous infusion, despite clinical indication.

RESULTS
We enrolled 20 patients, whose main features are displayed in Table1. During ICU stay, 25 samples were collected for TDM. 52% of them showed a correct meropenem dosage, 40% showed overdosage (no toxicity recorded), 8% showed underdosage. In 85% of cases meropenem was started empirically and in 70% of cases it was prescribed by infectious disease physician. In 50% of patients no micro-organisms were isolated from cultures.
We evaluated the relationship between CLcr and Css (blood meropenem concentration) and found a moderate correlation ($R=0.753$; $R^2=0.567$) with an inverse linear regression ($p<0.001$).

CONCLUSIONS
Meropenem continuous infusion, according to antimicrobial stewardship of our institution, guarantees drug blood levels above MIC in almost every case. Even if overdosage was found, no patient experienced toxicity symptoms.

Age (years)	62.5 ± 14.4
SAPS II	37.3 ± 18.9
LOS ICU (days)	10.2 ± 9.9
Duration of therapy (days)	9.0 ± 5.2
N° of TDM*	1.35 ± 0.8
Css	
in range	52% (13/25)
high	40% (10/25)
low	8% (2/25)
Site of infection	
lung	55% (11/25)
abdomen	35% (7/20)
unknown	10% (2/20)
Start by infectious disease physician	70% (14/20)
Empiric start	85% (17/20)
Start on microbiologic data	15% (3/20)
Survivors	
ICU	75% (15/20)
hospital	60% (12/20)
30 days	50% (10/20)

Table 1: Main characteristics of the population.

LOS Length Of Stay
ICU Intensive Care Unit
TDM Therapeutic Drug Monitoring
Css meropenem blood concentration
*number of samples sent to determine TDM during ICU stay