IMPACT OF REAL-TIME THERAPEUTIC DRUG MONITORING INTRODUCTION ON THE CARBEPENEM PRESCRIPTION AMONGST SEVERELY BURNED PATIENTS REQUIRING ICU ADMISSION

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Introduction
Antibiotic prescription is difficult in severely burned patients due to the extreme variability of drugs pharmacokinetics. Therapeutic Drug Monitoring (TDM) could be one way towards its optimization.

Methods
Retrospective analysis of imipenem/cilastin (IMIP) and meropenem (MERO) consumption (cumulative dose / number of burned patients / year) and daily dosage at an ICU burn center. All patients having received IMIP or MERO over the study period were included. Data were extracted from the computerized information system (Metavision®, IMD Soft) on all burned patients admitted from 2001 to 2011 to our burn center.

Results
Amongst the 366 burned patients admitted, 236 patients (63%) received antibiotics and 110 were prescribed carbapenems. Administration of IMIP increased from 1.6 g daily dose (period 1) to 1.8 g (period 2) (p = 0.01). In contrast, the steadily increase in MERO daily dose that peaked at 5.0 g/day in 2006 was followed by a decrease to 2.7 g in 2011 (Figure 1). A correlation between the number of TDM requests and the daily dose was found (R = 0.7) (Figure 2).

In parallel, we observed a reduction in the IMIP consumption at the Burn ICU from 10.3 cures/year (period 1) to 4.2 cures/year (period 2) (p = 0.04) and a sharp increase of the MERO consumption (from 4.4 cures/year (period 1) to 10.8 cures/year (period 2) (p = 0.02)).

Discussion - Conclusion
Our retrospective analysis of antibiotic use in severely burned patients suggests that real-time availability of TDM resulted in major alterations in carbapenem prescription.

The high daily doses of MERO empirically introduced since 2001 in symmetry with the doses administered to cystic fibrosis patients receiving lung transplant were not justified in severely burned patients. In contrast, the low daily doses of IMIP historically linked to the potential risk of seizures (Figure 3 and Figure 4) at high dosage, were also inappropriate. This may have contributed to the progressive replacement of IMIP by MERO.

Further prospective studies are now required to determine if these changes will impact on treatment efficacy and safety.

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