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Pharmacy department: 1/Nice University Hospital 2/Grasse Hospital 3/Cannes Hospital 4/Antibes Hospital 5/Toulon La Seyne s/ Mer Hospital 6/ Draguignan Hospital 7/Menton Hospital 8/ Infectious diseases unit, Nice University Hospital 9/ Laboratory of microbiology, Nice University Hospital

## Background

Carbapenems (CP) are a class of broad spectrum beta-lactam antibiotics effective against multidrug resistant bacteria (MDR) like extended spectrum β-lactamase producing enterobacteria (ESBLE). The consumption of CP has increased these last years in Europe and in France (+145 % since 2000). The frequent use of CP and their misuse contributes to increase the emergence of carbapenemase producing bacteria. In Europe the mean rate of CP resistance for *Klebsiella pneumoniae* is 8,3% with a maximum of 59,4% in Greece. Therefore, CP must be used as the last resort antibiotics. **Our aim was to assess the appropriateness of CP prescriptions in their indications and in the reassessments at 48-72 hours or at the bacteriological results.**

## Material / methods

- **7 health institutions** : 6 Hospital centers (HC) and 1 University Hospital Center (UHC)
- **Prospective inclusions** : CP prescriptions initiated during one given month (July 2015) recorded by the respective hospital pharmacy.
- **Observational study** : Data collected at the end of the treatment in the clinical units from the patient's medical file, and completed if needed through discussion with the physicians
- Method proposed in 2014 by the **French Society of Infectious Diseases**:

### Conformity of the prescription : assessment criteria

- Type of prescription : empirical or targeted
- Risk factor for MDR bacteria (listed)
- Severe sepsis / septic shock,
- Febrile neutropenia, endophthalmitis
- The possibility of an alternative therapy

### Other data collected

- Demographic
- Infectious site
- Bacteria implicated, susceptibility
- Treatment duration
- Patient outcome

## Results 1/2

- **118 CP prescriptions (116 patients):** 87 imipenem, 16 ertapenem, 15 meropenem

Hospitals	Beds	CP prescriptions
Antibes Hospital	622	7 (6%)
Cannes Hospital	864	13 (11%)
Draguignan Hospital	391	6 (5%)
Grasse Hospital	453	7 (6%)
Menton Hospital	242	1 (1%)
Nice University Hospital	1692	58 (49%)
Toulon/ La Seyne sur Mer Hospital	1189	26 (22%)

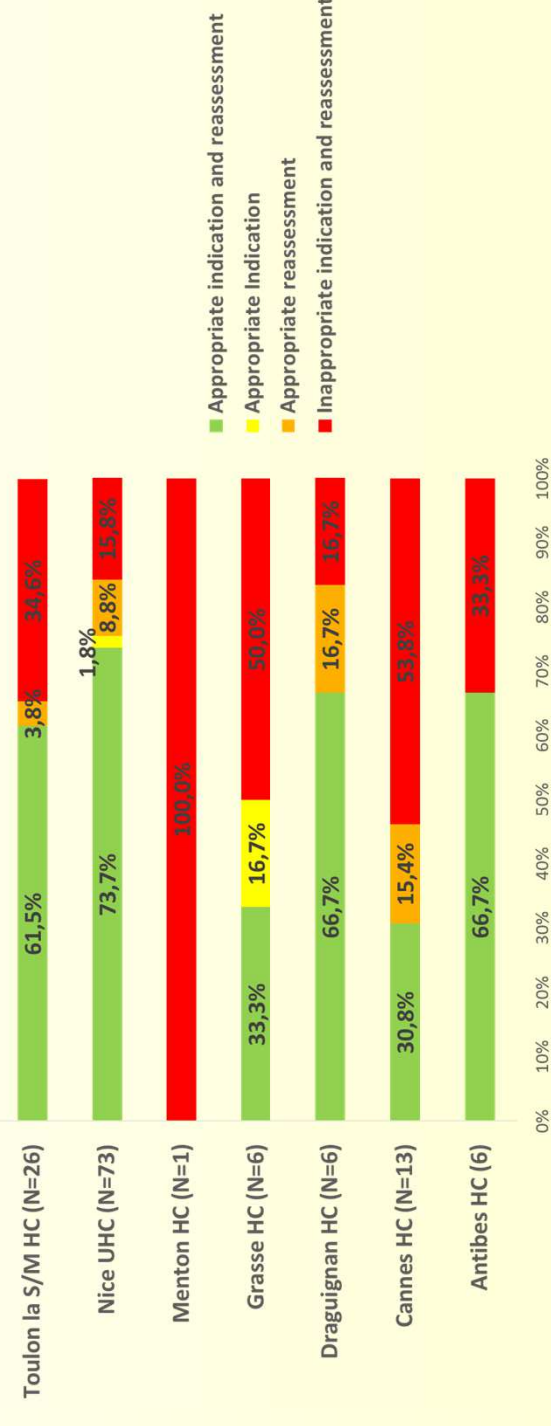
### Microbiological data

- Antibiotic courses: 70 empirical and 48 targeted
- Samples realised before treatment for 110 (93,2%) cases
- A bacteria implicated was documented for 78 cases:
  - 62 enterobacteria among which 43 ESBLE
  - 9 *P. aeruginosa* ; 2 *S. maltophilia*
  - 1 *S. aureus* ; 1 *B. cereus* ; 1 *S. constellatus*.

## Results 2/2

- ✓ **Conformity of the indication : 75/118 prescriptions (63,6%)**
  - Empirical prescriptions : 61,4%; targeted treatments : 66,7% (p = 0,56)
  - Concerning the 4 main infection types (73% of the prescriptions):
    - Prostatitis / pyelonephritis : 48,6% (18/37)
    - Pulmonary infection : 52,6% (10/19)
    - Intra-abdominal infection : 55,6% (10/18)
    - Febril neutropenia : 92,9% (13/14)
  - Severe sepsis / septic shock associated : 88,2% (30/34)
- ✓ **Conformity of the reassessment : 81/115 prescriptions (70,4%)**
  - Non assessable criteria for 3 cases (2 deaths < 48 hours and 1 prophylaxy for 24h)
  - 34 non appropriate reassessments:
    - Possibility of an alternative therapy: 15
    - Absence of reassessment: 10
    - Inappropriate indication and absence of microbial results: 9

### Global appropriateness : 72/115 CP prescriptions (62,6%)



- Conformity rate for HCs (51,7%) versus HCU (%), p=0,015

## Conclusion

More than 1/3 of the CP prescription were not appropriate. Differences observed in the conformity rate between hospitals or between HC versus HCU might be related to various internal organizations and inequal human resources. Several suggestions for improvement were proposed to the regional network :

- to study the organization of each hospital and their impact on the conformity of CP prescriptions
  - to work on regional recommendations for the management of CP prescriptions
  - to implement targeted actions in each hospital and units according to their respective results.
- The regional network will allow us to pool our resources and share our ideas, in order to harmonize our clinical practices and organizations.