eahp european association of hospital pharmacists
25, 26 et 27 Mars 2015
20th Congress of the European Association of Hospital Pharmacists
HAMBOURG
CP 120

Comparison of Antibiotic Consumption and Bacterial Resistance in two Teaching Hospitals: Impact of a Multidisciplinary Antibiotic Management Program

S. Pfalzgraf[1], P. Guyot[1], B. Laluque[1], M. Jouannet-Romaszko[1], B. Demoré[2], O. Baud[3], J.P. Romaszko[4], S.Pelegrin[1], V. Sautou[1].
1. CHU Clermont-Ferrand, Pôle Pharmacie, Hôp G Montpied, F63003 Clermont-Ferrand, France . 2. CHU Nancy, Pôle Pharmacie, Hôp Brabois, F54511 Vandoeuvre-les-Nancy, France. 3. CHU Clermont-Ferrand, Antenne Régionale de Lutte Contre les Infections Nosocomiales, Hôp G Montpied, F63003 Clermont-Ferrand, France. 4. CHU Clermont-Ferrand, Laboratoire de bactériologie, Hôp G Montpied, F63003 Clermont-Ferrand, France.

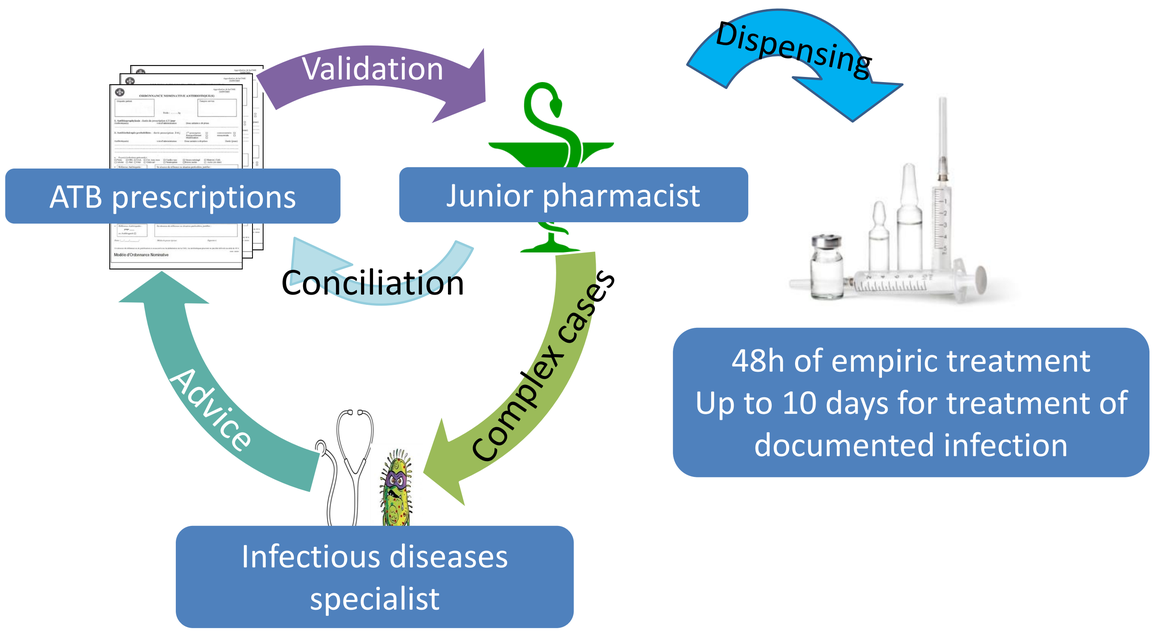
Background

Hospital 1 (H1, 1654 beds) implemented an antibiotic [ATB] management program in 2006. In hospital 2 (H2, 1582 beds), only carbapenems are prescribed in this way.

Purpose

May the program have an impact on H1's antibiotic consumption and bacterial ecology ? Are there differences with H2's ?

H1's ATB management program



Material and Methods

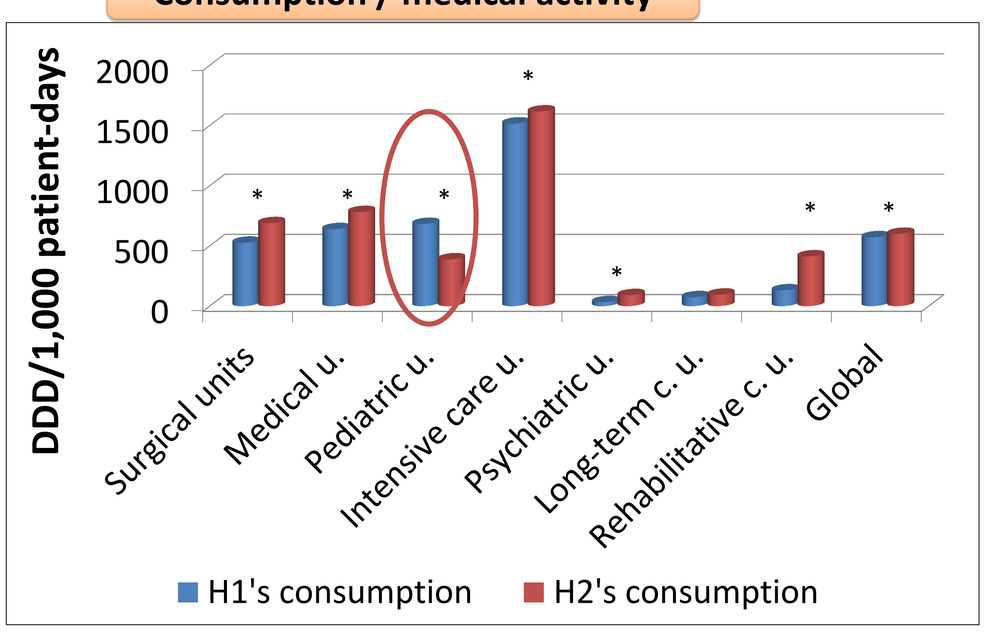
- ✓ H1's and H2's consumption and resistance data from **2011 to 2013** extracted from the pharmacy management and bacteriology laboratory software
- ✓ Data uploaded on the ConsoRes® tool to shape them *(1)*
- ✓ **19 bacteria / antibiotic couples** of clinical interest
- ✓ Resistance rates [RR] were compared using a Fisher's exact test, mean ATB consumption using a Student test.

Couples

- ✓ *E. coli* / cefotaxim, ciprofloxacin (CFX), imipenem, ertapenem
- ✓ *E. cloacae* / cefotaxim, CFX, imipenem, ertapenem
- ✓ *K. pneumoniae* / cefotaxim, CFX, imipenem, ertapenem
- ✓ *A. baumannii* / imipenem
- ✓ *P. aeruginosa* / ceftazidim, CFX, imipenem
- ✓ *S. aureus* / oxacillin, vancomycin, teicoplanin

RESULTS

Consumption / medical activity



Evolution 2011 - 2013

RR pattern	H1	H2
Significant increase (P<0,05)	**NONE**	E. cloacae / cefotaxim (0,002) E. coli / cefotaxim (0,024) K. pneumoniae / cefotaxim (0,001)
Significant decrease (P<0,05)	E. cloacae / ertapenem (0,005) E. coli / ertapenem (0,003) K. pneum. / ertapenem (0,01)	E. coli / CFX (0,004) E. cloacae / CFX (0,049) P. aeruginosa / CFX (1,2e-8) P. aeruginosa / ceftazidim (3,8e-6)
Stability (P=1)	E. cloacae / imipenem S. aureus / vancomycin A. baumannii / imipenem	E. coli / imipenem E. coli / ertapenem K. pneum. / imipenem S. aureus / vancomycin
Non significant (P>0,05)	**9** non significant increases **4** non significant decreases	**4** non significant increases **4** non significant decreases

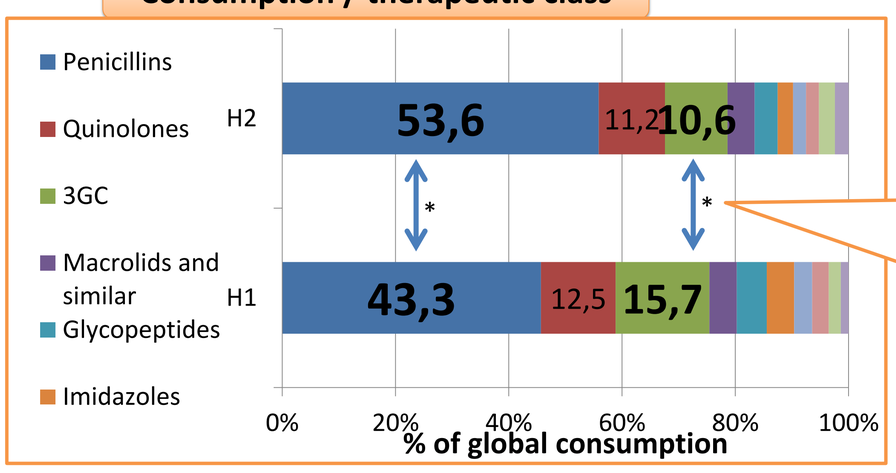
Respectively :
From 29,9% (76 R / 254 P) to 42,2% (157 R / 372 P)
From 9,8% (345 R / 3510 P) to 11,5% (425 R /3705 P)
From 3,5% (13 R / 373 P) to 9,2% (38 R / 412 P)

CFX consumption (DDD/1,000 PD)
H1: 28,1 H2: 11,6
P < 0,01

K. pneumoniae / imipenem
P. aeruginosa / ceftazidim, imipenem,
CFX

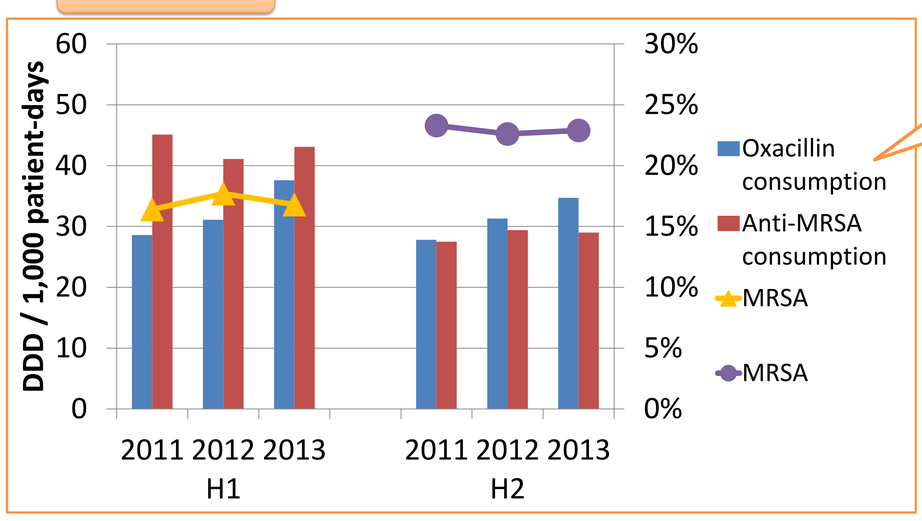
E. cloacae / ertapenem
P. aeruginosa / imipenem
S. aureus / oxacillin, teicoplanin

Consumption / therapeutic class



Penicillins + 3GC = difference no longer significant P=0,08

MRSA



MRSA significantly higher in H2 but lower consumption of anti-MRSA

Vancomycin consumption (DDD/1,000 PD)
H1: 22,3 H2: 14
P=0,175 *(2)*

Fosfomycin consumption (DDD/1,000 PD)
H1: 5,9 H2: 0,4
P<0,05

Discussion

- ✓ Better use of ATB doesn't necessarily mean lower consumption!
- ✓ Differences between both hospitals in terms of RR and consumption have several possible explanations (different bacterial ecologies between the 2 areas, etc.), but H1's program seems to have a positive impact on both criteria.
- ✓ Few studies showed the impact of such a program on a hospital's microbial ecology *(2-4)*
- ✓ Pediatric units: H1's count more beds and different activities associated with more important ATB consumption, like orthopedic surgery, mucoviscidosis...
- ✓ Improvement still to be made in H1: 3GC consumption still increasing, and ciprofloxacin consumption, in constant decrease from 2011 to 2013 but both significantly higher than H2's.
- ✓ Lower consumption of anti-MRSA in H2: difference of prescription habits between both hospitals (most consumed molecule, different usual doses, and difference between DDD and Prescribed Daily Dose [PDD] for each molecule).

Conclusion

- ✓ This comparison showed a trend that has to be confirmed over upcoming years.

(1) More information on the ConsoRes webtool : http://www.consores.net/ and http://www.club-consores.fr/ (French)
(2) Bevilacqua S, Demoré B, Erpedling ML. Effects of an operational multidisciplinary team on hospital antibiotic use and cost in France: a cluster controlled trial. Int J Clin Pharm 2011; 33: 521-528
(3) Carling P, Fung T, Killion A. Favorable impact of a multidisciplinary antibiotic management program conducted during 7 years. Infect Cont Hosp Ep 2003; 24: 699-706.
(4) Saizy-Callaert S, Causse R, Fuhrman C. Impact of a multidisciplinary approach to the control of antibiotic prescription in a general hospital. J Hosp Infect 2003; 53: 177–82.