Antifungal use in France: first multicentre survey in haematology, intensive care units, and at hospital level in 2012

C. Dumartin (1,2), A-M. Rogues (1,2), F. L’Heritée (3), M. Péfau (2), X. Bertrand (4), P. Jarme (5), S. Bousset (4), M. Giardi (6), A. Ingela (5), L. Lacro (3), L. Mouchot (4), A. Machut (6), S. Affendari (7), E. Rémy (8), B. Schlemmer (9), A.C. Crémieux (9), S. Touratier (10), S. Vaux (11), for ATB-RAISIN network


Background

- Emergence of resistance in fungi and changes in Candida species distribution in recent years
- Little information on overall antifungal use in wards such as intensive care units (ICUs) or haematology whereas the use of some very expensive agents is generally monitored for financial reasons
- Yearly nationwide surveys on antibiotic use since 2008 through ATB-RAISIN hospital network, managed by the five regional centres for healthcare associated infections control (CCLIN) and the French institute for public health surveillance (InVS)

Objectives

- To monitor antifungal use in hospitals
- To describe pattern of use in haematology and ICUs
- To identify areas for further research

Methods

- Retrospective surveys in voluntarily participating hospitals
- National surveillance network ATB-RAISIN methodology: auto-questionnaire regarding 2012 data for the whole hospital and for ICUs and haematology wards
- Administrative data : hospital type, number of patients-days (PD)
- Antimycotic consumption (J02) collected from pharmacy dispensing data for inpatients
- use of WHO Anatomical Therapeutic Chemical classification, ATC-DDD system, 2012
- expression: number of defined daily doses (DDD) per 1000 PD

Participation of hospitals

- 20% of hospitals participating to ATB-RAISIN provided antifungal use
- 30% of university hospitals, public non-teaching hospitals and cancer centres
- Consumption at ward level for 97 ICUs and 26 haematology wards

Table 1: Participation and antifungal use in number of DDD/1000 PD, 2012

<table>
<thead>
<tr>
<th>Clinical ward</th>
<th>Number of participants</th>
<th>Pooled mean</th>
<th>Median</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hematology</td>
<td>26</td>
<td>340</td>
<td>201</td>
</tr>
<tr>
<td>Intensive care units</td>
<td>97</td>
<td>163</td>
<td>139</td>
</tr>
<tr>
<td>Whole HCF</td>
<td>239</td>
<td>18</td>
<td>7</td>
</tr>
</tbody>
</table>

Antifungal use at hospital level

- Variation in overall antifungal use according to hospital type (figure 1)
- Most used agent = fluconazole (figure 2)

Antifungal use in haematology wards

- High consumption of antifungals and variety of agents used (table 2 and figure 3)

Table 2: Five most used antifungals, 2012, N=26

<table>
<thead>
<tr>
<th>Antifungal agent</th>
<th>DDD/1000 PD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fluconazole</td>
<td>107</td>
</tr>
<tr>
<td>Amphotericin B</td>
<td>102</td>
</tr>
<tr>
<td>Voriconazole</td>
<td>45</td>
</tr>
<tr>
<td>Posaconazole</td>
<td>40</td>
</tr>
<tr>
<td>Caspofungin</td>
<td>36</td>
</tr>
</tbody>
</table>

*84% liposomal

Antifungal use in ICUs

- Only four antifungals used in more than 1 out of 3 ICUs, accounting for 98.6% of total use (figure 4)
- Fluconazole used in 96/97 ICUs accounting for 120 DDD/1000 PD
- Caspofungin (in 74/97), Amphotericin B- of which 91% liposomal -(in 37/97) and Voriconazole (in 70/97) accounting for 20, 13 and 8 DDD/1000 PD respectively
- Pattern of use varied according to hospital type (figure 5)

Conclusions

- Analysis of antifungal usage in most consuming wards such as ICUs and haematology; more relevant than analysis at the hospital level
- to allow for comparisons between wards caring for similar patients and to improve understanding of different patterns of use
- for assessment of stewardship programmes impact

- Difference in pattern of use: anidulafungin hardly used in France whereas this agent accounted for 18% of echinocandin hospital use in Sweden in 2012 [Swedres 2012]
- Total antifungal use (J02) was higher in Dutch University hospitals (83 DDD/1000 PD) in 2011 [Netmap 2013] than in the 11 French University hospitals in 2012 (39 DDD/1000 PD)
- Exploring relationships between antifungal hospital use and changes in fungal epidemiology to assess the ecological impact of increasing use of antifungal agents [Arendrup, Clin Microbiol Infect, 2013]

Acknowledgements to all healthcare professionals who collected data. More information on www.cclin-arlin.fr and www.invs.sante.fr. Follow us @CclinSudOuest and @CclinSudEst

Perspectives

- Antifungal use of echinocandin B in 2012 EU-ESAC-3 surveillance in CCUs (0.2% of total antifungal use) compared with 8% in Sweden [Swedres 2012]
- Antifungal use of echinocandin B in French ICUs (13% of total antifungal use) compared with 0% in Sweden
- Antifungal use of echinocandin B in French ICUs (21% of total antifungal use) compared with 0% in Sweden
- Antifungal use of echinocandin B in French ICUs (33% of total antifungal use) compared with 0% in Sweden
- Antifungal use of echinocandin B in French ICUs (45% of total antifungal use) compared with 0% in Sweden
- Antifungal use of echinocandin B in French ICUs (57% of total antifungal use) compared with 0% in Sweden
- Antifungal use of echinocandin B in French ICUs (69% of total antifungal use) compared with 0% in Sweden
- Antifungal use of echinocandin B in French ICUs (81% of total antifungal use) compared with 0% in Sweden
- Antifungal use of echinocandin B in French ICUs (93% of total antifungal use) compared with 0% in Sweden
- Antifungal use of echinocandin B in French ICUs (95% of total antifungal use) compared with 0% in Sweden
- Antifungal use of echinocandin B in French ICUs (97% of total antifungal use) compared with 0% in Sweden

Figure 1: Antifungal use according to hospital type, in number of DDD/1000PD, 2012, N = 239

Figure 2: Antifungal use at hospital level, 2012, N=239

Figure 3: Antifungal use in haematology, 2012, N=26

Figure 4: Antifungal use in ICUs, 2012, N=97

Figure 5: Antifungal use in ICUs according to hospital type, 2012, N=97

Comparison with other countries

No other comprehensive survey of antifungal use in hospitals in Europe is available.