Antibiotic resistance in bacteria from outpatients in France

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ONERBA : non profit organization supported by AFSSAPS (French drug agency)
Antibiotic consumption in the community winter months, per age classes France 2001-2006

- 23% overall
- 34% 0-5 years
- 35% 6-15 years
- 18% >15 years

Courtesy D. Guillemot
Antibiotic consumption in the community winter months, per ATB classes France 2001-2006

- 25% penicillins
- 26% cephalosp
- 32% macrolides
+ 14% quinolones

- 23% overall
What about resistance rates?

Good news... and Bad news!
Good news
Streptococcus pneumoniae and penicillin, erythromycin
% Penicillin non susceptible *S. pneumoniae* in France 1984 - 2006

**National plan for rational use of antibiotics**

50 300 strains


Vincent Jarlier November 2008

CNRP, Annual report 2007

Courtesy E. Varon
S. pneumoniae: evolution of antibiotic resistance in France 2001-2006

Children ≤ 15 years

Adults > 15 years

Courtesy E. Varon

Courtesy ORP - E. Varon, L. Gutmann; CNRPreport 2007
Streptococcus pyogenes
(StrepA)
and erythromycin
Decrease of erythromycin susceptibility in *Streptococcus pyogenes* France 1993-2003

Networks: Aforcopi-Bio, Armées, Col-BVH, Ile de France, Réussir, Azay
% of erythromycin susceptibility in *Streptococcus pyogenes*

12 years survey in France 1996 - 2007

Network REUSSIR

Courtesy H. Chardon

500 to 700 strains / year

- 88% in 1996
- 87% in 2007
- 74% in 2002-03
Staphylococcus aureus in community acquired bacteremias
Susceptibility to non β-lactams in MSSA isolated from CA bacteremias (standard definition)
Network Ile -de-France 2001-2006 (~ 100 cases /year)

- Erythromycin: 96%
- Rifampicin: 92%
- Fusidic acid: 85%
- Quinolones: 70%
- Gentamicin: 60%

Courtesy Y. Péan
Staphylococcus aureus in community acquired Skin –soft tissue infections
% susceptibility in MSSA causing CA SSTIs
Network Col-BVH
2006 prospective study (285 cases)

<table>
<thead>
<tr>
<th>Antibiotic</th>
<th>Susceptibility</th>
</tr>
</thead>
<tbody>
<tr>
<td>Erythromycin</td>
<td>90</td>
</tr>
<tr>
<td>Rifampicine</td>
<td>100</td>
</tr>
<tr>
<td>Fusidic acid</td>
<td>97</td>
</tr>
<tr>
<td>Tetracyclines</td>
<td>97</td>
</tr>
<tr>
<td>Gentamicin</td>
<td>99</td>
</tr>
<tr>
<td>F.quinolones</td>
<td>97</td>
</tr>
</tbody>
</table>

Courtesy JW Decousser
CA MRSA
producing PVL toxin
in the community
# MRSA PVL: retrospective study

ONERBA 2000-2003

<table>
<thead>
<tr>
<th></th>
<th>2001</th>
<th>2002</th>
<th>2003</th>
</tr>
</thead>
<tbody>
<tr>
<td>MRSA</td>
<td>2.647</td>
<td>2.568</td>
<td>1.333</td>
</tr>
<tr>
<td>PVL pattern</td>
<td>21 (0.8%)</td>
<td>17 (0.8%)</td>
<td>9 (0.7%)</td>
</tr>
<tr>
<td>Available strains</td>
<td>11</td>
<td>10</td>
<td>6</td>
</tr>
<tr>
<td>PVL strains</td>
<td>11</td>
<td>10</td>
<td>6</td>
</tr>
</tbody>
</table>
## MRSA PVL: prospective study

**ONERBA 2004**

<table>
<thead>
<tr>
<th></th>
<th>Total</th>
<th>Inpatients</th>
<th>Outpatients</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>N</strong></td>
<td>3901</td>
<td>3249</td>
<td>652</td>
</tr>
<tr>
<td><strong>%</strong></td>
<td>100</td>
<td>98.8</td>
<td>9.5</td>
</tr>
</tbody>
</table>

### MRSA PVL pattern

<table>
<thead>
<tr>
<th>Pattern</th>
<th>Total</th>
<th>Inpatients</th>
<th>Outpatients</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>N</strong></td>
<td>56</td>
<td>55</td>
<td>1</td>
</tr>
<tr>
<td><strong>%</strong></td>
<td>(1.4)</td>
<td>(1.7)*</td>
<td>(0.1)</td>
</tr>
</tbody>
</table>

### MRSA PVL strains

<table>
<thead>
<tr>
<th>Strains</th>
<th>Total</th>
<th>Inpatients</th>
<th>Outpatients</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>N</strong></td>
<td>48*</td>
<td>47</td>
<td>1</td>
</tr>
</tbody>
</table>

* 6 strains not tested

* National extrapolation: 1.7% x 60 000 MRSA cases /year
  >> ~ 1000 cases MRSA PVL cases/year
Resistant tuberculosis
Cases of MDR and XDR tuberculosis in France 1998-2007

MDR: 40 to 70 / year (1% of TBs)

XDR: 1 to 2 / year (0.02% of TBs)
Curbing MRSA in French hospitals: decreasing the risk of H-MRSA spread into the community

1993 - 2007
MRSA control
Programme
Univ. hospitals
Paris area (AP-HP)
1993

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Alcohol-based hand rub solutions campaign at AP-HP 2001-02
Alcool based hand rub solutions
Paris area hospitals (AP-HP)

<2 ml/DH

21 ml/DH

campaign

Liters per 1,000 days of hospitalisation


Years

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% MRSA in *S. aureus* and MRSA incidence (per 100 admissions or 1,000 DHs)
Univ. hospitals of Paris area (n=39) 1993-2007

50% decrease in 15 years
Maîtrise de la diffusion des bactéries multirésistantes aux antibiotiques

Récemment pour les établissements de santé

MINISTÈRE DE L'EMPLOI ET DE LA SOLIDARITÉ

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% MRSA in *S. aureus* from bacteremias in 3 French networks participating in EARSS (19 Univ Hosp, 9 GH Paris area, 25 GH all country) 2001-2007

Global decrease 21 %

Networks: Azay, Ile de France, REUSSIR
MRSA rates per 1,000 DHs
227 French hospitals
Networks C-CLIN - RAISIN
2003-2007, Geographic areas

Global decrease 25 %

National extrapolation: still 50,000 MRSA cases/year!!
VRE control in univ.hospitals of Paris area: decreasing the risk of H-VRE spread into the community
VRE cases per month university hospitals, Paris area (AP-HP) 2004-2007

Classical MDR measure (2004-06)

Reinforced measures (2006-07)
Bad news
Escherichia coli and fluoroquinolones in bacteremias
Susceptibility of *E. coli* to major drugs in CA bacteremias (standard definition)
Network Ile-de-France
2001 – 2006 (~ 500 cases /year)

- **Cefotaxime**: ~95%
- **Gentamicin**: ~87%
- **Ciprofloxacin**: ~87%

*Courtesy Y. Péan*
ESBL enterobacteria
ESBL incidence rates per 1,000 DHs
227 French hospitals
Networks C.CLIN - RAISIN
2003-2007 Medical activities

Rate x 2 to 3 in 4 years
ESBL incidence rates per 1,000 DHs
227 French hospitals
Networks C.CLIN - RAISIN
2003-2007 Geographic areas

Rate x 2 to 8 in 4 years

Now: 1 case of ESBL for 2 cases of MRSA
ESBL Escherichia coli
Proportion of *E. coli* among ESBL enterobacteria

227 French hospitals

Networks C.CLIN - RAISIN

2003-2007 Geographic areas

% *E. coli*
Incidence rate of ESBL *E. coli* per 1,000 DHs

227 French hospitals

Networks C.CLIN - RAISIN

2003–2007 Geographic areas

Incidence rate x 2 to 10 in 4 years

Now: 1 case of ESBL *E. coli* for 4 cases of MRSA
Rate of incidence (per 1,000 DHs) of different species of ESBL enterobacteria Univ. hospitals of Paris area 1996-2007

- Incidence E. coli BLSE
- Incidence K. pneumoniae BLSE
- Incidence E. cloacae BLSE
- Incidence autres entérobact. BLSE

Univ. hospitals of Paris area 1996-2007

Rate of incidence (per 1,000 DHs) of different species of ESBL enterobacteria Univ. hospitals of Paris area 1996-2007
% susceptibility to cefotaxime in *E. coli* bacteremias in France 2002-2007 (EARSS)

% susceptible

National extrapolation: 1,500 ESBL *E. coli* bacteremias /year

Networks:
- Azay
- Ile de France
- Réussir
- TOTAL

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Susceptibility of *E. coli* to cefotaxime in CA and HA bacteremias (standard def.)
Network Ile-de-France 2001 – 2006 (~ 600 cases /year)

National extrapolation:
1,000 HA and 500 CA ESBL *E. coli* bacteremias /year

Courtesy Y. Péan
ESBL enterobacteria in outpatients
Prospective study ONERBA 2006

- 22 labs for GPs
- 2 months
- 6,771 strains included
- 72 ESBL

ESBL global proportion 1%

- 10/72 patients: no previous hospitalisation nor medical care at home

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Controlling antibiotic resistance in the community

- Decrease ATB consumption
- Vaccinations

ATB resistance community
Controlling antibiotic resistance in the community

- Decrease ATB consumption
- Vaccinations

ATB resistance community

MRSA, VRE, ESBL

Prevent cross transmission

ATB resistance hospital

Vincent Jarlier November 2008
Controlling antibiotic resistance in the community

Decrease ATB consumption

Vaccinations

ATB resistance community

Vaccinations

MRSA, VRE, ESBL

Prevent cross transmission

ATB resistance hospital

La Friction Hydro-Alcoolique des mains c’est simple!
Controlling antibiotic resistance in the community

- Decrease ATB consumption
- Vaccinations
- ATB resistance community
- Prevent cross transmission in schools, families…(ABHRSs)
- MRSA, VRE, ESBL
- ATB resistance hospital
- Prevent cross transmission
- Vaccinations

La Friction Hydro-Alcoolique des mains c’est simple!
Antibiotic policy campaign at AP-HP 2006-08

Thank you.....

Vincent Jarlier November 2008