Patient and Public Involvement in Infectious Diseases Research

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Deaths from hospital superbug C.diff soar by a THIRD in just one year

"It is absolutely outrageous that year on year older people are dying as a result of failure to ensure high levels of hygiene in our hospitals.

'People go into hospital expecting to be looked after, not to run the risk of secondary infections as a result of poor hygiene.'
Role of symptomatic patients in *C. difficile* transmission

- We sequenced 1223 of all 1251 hospital and community CDI cases (98%) in Oxfordshire, September 2007 – March 2011
- Hospital admission and ward movement data, and home postcode district and GP location available for each case

- 3 Hospitals
  - Typical CDI incidence
  - Infection control in line with published guidelines

Findings

- Only 20% of C diff infections are caught in the hospital from another case and incidence is decreasing

- < 3% caught from a “dirty room”

- Most cases caught from a very large reservoir

- Where is it coming from?
### Risk factors in Oxfordshire infant study

<table>
<thead>
<tr>
<th>Significant</th>
<th><em>C. difficile</em> positivity (n=58)</th>
<th>Presence of toxigenic <em>C. difficile</em> (n=34)</th>
<th>Not significant</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>Older age ↑</td>
<td>Older age ↑</td>
<td>• Gender</td>
</tr>
<tr>
<td>Feeding</td>
<td>Breastfeeding ↓</td>
<td>Breastfeeding ↓</td>
<td>• Delivery mode</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Formula feeding only ↑</td>
<td>• Hospital vs home birth (low numbers)</td>
</tr>
<tr>
<td>Childcare</td>
<td>Grandparent or nursery involved in childcare ↑</td>
<td>Grandparent or nursery involved in childcare ↑</td>
<td>• Birthweight</td>
</tr>
<tr>
<td>Any pet</td>
<td>↑: dogs</td>
<td>↑: dogs</td>
<td>• Gestational age</td>
</tr>
<tr>
<td>Hospital admission</td>
<td>In last month, three months or year ↑</td>
<td>In last three months or year ↑</td>
<td>• Parental/extended family hospital/ward employment</td>
</tr>
<tr>
<td>Antibiotics</td>
<td>Any previous systemic antibiotic ↑</td>
<td>Any previous systemic antibiotic ↑</td>
<td>• Childcare by childminder</td>
</tr>
<tr>
<td>Diarrhoea</td>
<td>Presence ↑</td>
<td>Presence ↑</td>
<td>• Number of siblings</td>
</tr>
</tbody>
</table>

- 13 clusters contain isolates from adults with CDI and paediatric isolates
- 8 of these in association with toxigenic isolates
- Supports transmission of both toxigenic and non-toxigenic strains amongst adults and children ≤2 years in Oxfordshire

**ALL CLUSTERS**

Isolates ≤2 SNVs apart

- 13 clusters contain isolates from adults with CDI and paediatric isolates
- 8 of these in association with toxigenic isolates
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**LEGEND**

- Adult isolate sequenced as part of Oxfordshire CDI database
- Child in study
- Sequence type for cluster; underlined + bold = toxigenic

**Cluster Types**

- ST-x
- ST-2
- ST-6
- ST-15
- ST-26
- ST-37
- ST-54
- ST-58
- ST-26
Subdividing the possible secondary cases into those with and without hospital contact:

No evidence that genetically distinct cases, introductions to the symptomatic population declined differently to genetically related cases (possible secondary cases)

Suggests that interventions not targeting only transmission, such as antimicrobial stewardship, have played a major role in declines in CDI incidence over the last 5 years

Challenges

- Identify important questions from a patient’s perspective
- Develop a better understanding of how the public perceives our research
- Find ways of better presenting our research