

Antimicrobial susceptibility of invasive *Haemophilus influenzae*, 2012

The antimicrobial susceptibility of all 60 viable invasive isolates of *H. influenzae* referred to ESR in 2012 was tested (see table). Ampicillin, co-amoxiclav, cefuroxime and cefaclor minimum inhibitory concentrations (MICs) were determined by Etest on *Haemophilus* test medium. Cefotaxime, ciprofloxacin, clarithromycin, co-trimoxazole, rifampicin and tetracycline susceptibilities were determined by disc diffusion on *Haemophilus* test medium. MICs and disc diffusion zone diameters were interpreted according to the Clinical and Laboratory Standards Institute's criteria.¹

Four (6.7%) of the 60 isolates were serotype b. Six (10.0%) isolates produced β -lactamase. Eleven isolates were ampicillin resistant, but not β -lactamase producing – so-called BLNAR (β -lactamase-negative, ampicillin-resistant) *H. influenzae*. One of the β -lactamase producing isolates appeared to also have the BLNAR mechanism of resistance, that is, an altered penicillin-binding protein (PBP).

Antimicrobial resistance among Haemophilus influenzae isolates from invasive disease, 2012

| Antibiotic ¹ | Number tested | Number resistant ² | Percent resistant |
|-------------------------|---------------|-------------------------------|-------------------|
| Ampicillin | 60 | 17 | 28.3 |
| Co-amoxiclav | 60 | 12 | 20.0 |
| Cefaclor | 60 | 12 | 20.0 |
| Cefuroxime | 60 | 12 | 20.0 |
| Cefotaxime | 60 | 0 | 0 |
| Ciprofloxacin | 60 | 0 | 0 |
| Clarithromycin | 60 | 2 | 3.3 |
| Co-trimoxazole | 60 | 18 | 30.0 |
| Rifampicin | 60 | 0 | 0 |
| Tetracycline | 60 | 0 | 0 |

¹ Results for the full range of antibiotics tested are presented. Many are not appropriate for the treatment of invasive *H. influenzae* disease or the chemoprophylaxis of contacts.

² All β -lactamase-negative, ampicillin-resistant (BLNAR) *H. influenzae* have been considered resistant to ampicillin, co-amoxiclav, cefaclor and cefuroxime, in line with the Clinical and Laboratory Standards Institute's recommendations, although they often test as susceptible to these antibiotics in standard susceptibility tests.

Trends in ampicillin resistance and β -lactamase production among invasive *H. influenzae* over the last 10 years are shown in the figure below. Until 2005, most of the ampicillin resistance was due to β -lactamase production. However, since that time, only about half the ampicillin-resistant isolates have been producers of β -lactamase, with the other half being BLNAR *H. influenzae*.

¹ Clinical and Laboratory Standards Institute. Performance standards for antimicrobial susceptibility testing; twenty-second informational supplement. Wayne, PA, USA: CLSI; 2012. CLSI document M100-S22

Ampicillin resistance and β -lactamase production among invasive Haemophilus influenzae, 2003-2012

