

Multiple Resistance is Rare in Community-Acquired Lower Respiratory Tract Infection in the UK and Ireland

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Introduction

Multiple resistance is a focus for concern over levels of antimicrobial resistance in common pathogens since treatment options are particularly limited if organisms develop resistance to multiple agents.

Methods

1328 *S. pneumoniae*, 1894 *H. influenzae* and 845 *M. catarrhalis* from lower respiratory specimens were collected by 20 laboratories in the UK and Eire in the winters of 1999-2000 and 2000-2001. Duplicate isolates (collected within 2 weeks of a previous isolate) and isolates from patients with cystic fibrosis or in hospital more than 48 hours were excluded. Isolates were centrally tested by the BSAC agar dilution MIC method and categorised by BSAC breakpoints. The agents considered and breakpoints are shown in the table

Results

Fewer than 10%, 3% and 1% of *S. pneumoniae*, *H. influenzae*, and *M. catarrhalis* were resistant to 2 or more unrelated antimicrobials. Fewer than 5% of *S. pneumoniae* and 0.1% of *H. influenzae* and *M. catarrhalis* were resistant to 3 or more unrelated agents. In *S. pneumoniae*, there was no association between resistance to ciprofloxacin and any other agent, but in all possible pairings of the other four antibiotics, resistance to one was positively associated with resistance to the other ($p < 0.0001$).

Conclusion

Multiple resistance is rare in community-acquired lower respiratory tract infection in the UK and Eire, although continued surveillance is warranted particularly for *S. pneumoniae*, 4% of which show reduced susceptibility to three unrelated antimicrobials.

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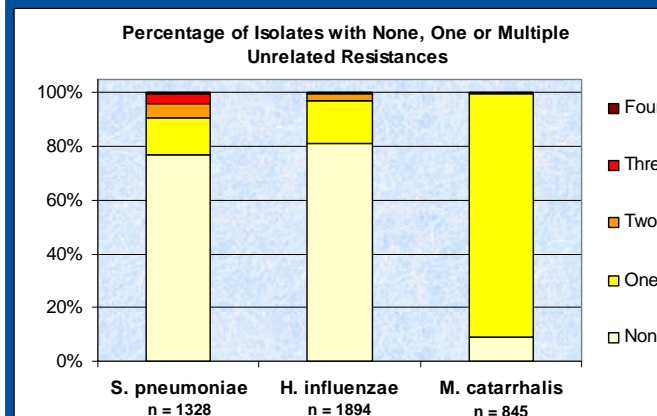
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Antimicrobials and Breakpoints mg/L			
<i>S. pneumoniae</i>	<i>H. influenzae</i>	<i>M. catarrhalis</i>	
penicillin NS ≥ 0.12	ampicillin R ≥ 2	ampicillin	R ≥ 2
amoxicillin R ≥ 2	tetracycline R ≥ 2	tetracycline	R ≥ 2
tetracycline R ≥ 2	erythromycin R ≥ 16	erythromycin	R ≥ 1
erythromycin R ≥ 1	ciprofloxacin R ≥ 2	ciprofloxacin	R ≥ 2
ciprofloxacin R ≥ 4			

Prevalence of Individual resistances			
% above breakpoint	<i>S. pneumoniae</i>	<i>H. influenzae</i>	<i>M. catarrhalis</i>
penicillin	10.5	n/a	n/a
amoxicillin/ampicillin	1.3	15.6	91.0
tetracycline	8.4	3.1	0.2
erythromycin	12.3	3.3	0
ciprofloxacin	5.3	0.1	0



<i>M. catarrhalis</i>	
76	769

769 of 845 *M. catarrhalis* (91%) were ampicillin-resistant due to β -lactamase production, but only one isolate had any additional resistance (to tetracycline).

<i>H. influenzae</i>	
1533	361
1533 of 1894 <i>H. influenzae</i> (81%) were susceptible to all four unrelated agents.	
307	54
Of the remaining 361 isolates, 307 were resistant to only one agent, most commonly ampicillin (242) or erythromycin (55).	
53	1
53 isolates (3%) were resistant to two unrelated agents, 47 of them to erythromycin and ciprofloxacin. One isolate was resistant to ampicillin, tetracycline and erythromycin. None was resistant to all four classes of agent.	

<i>S. pneumoniae</i>	
1024	304
1024 of 1328 <i>S. pneumoniae</i> (77%) were susceptible to all the agents.	
181	128
181 isolates were non-susceptible only to one class (60 ery, 59 cip, 50 pen, 12 tet).	
68	53
68 isolates (5%) were non-susceptible to just two unrelated agents (29 tet+ery, 19 tet+pen, 15 pen+ery, 5 others). 53 isolates (4%) were non-susceptible to three classes, 49 of these being NS to pen+tet+ery. A further two had reduced susceptibility to all four classes - pen+tet+ery+cip - but remained S to amoxicillin.	

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