Susceptibility of pneumococci causing meningitis in England and Wales to first-line antimicrobial agents, 2001–2004

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Sir,

Historically, penicillin was the drug of choice for treating pneumococcal infections, including meningitis, but strains with reduced susceptibility have been reported worldwide over the last four decades.1 Although pneumococcal pneumonia remains amenable to treatment with high-dose penicillin, even when caused by non-susceptible strains,2 any degree of penicillin non-susceptibility (MIC ≥ 0.12 mg/L) is associated with a likelihood of treatment failure in pneumococcal meningitis due to the poor penetration of penicillin into CSF.3 Cefotaxime and ceftriaxone have better pharmacodynamic profiles than penicillin and are currently recommended for the empirical treatment of pneumococcal meningitis and for the treatment of meningitis known to be caused by penicillin-resistant pneumococci, either alone or in combination with vancomycin and possibly rifampicin.3,4

We investigated resistance to first-line agents among Streptococcus pneumoniae causing meningitis in England and Wales between 2001 and 2004. Cases were identified using two data sources, which were combined and reconciled to identify duplicates.5 The first was the LabBase database maintained by the Health Protection Agency (HPA), which records cases of meningitis and bacteraemia voluntarily reported by hospital microbiology laboratories in England and Wales.6 Each record on the database corresponds to one patient episode and contains clinical and demographic information. Records often also contain information on the antibiotic susceptibility of the pathogen isolated. The second data source was the MOLIS database maintained at the HPA Centre for Infections (CfI), which records information on isolates referred to the Reference Laboratories for serotyping and/or susceptibility testing. Hospital microbiologists reporting cases of pneumococcal meningitis to LabBase may or may not also refer the corresponding isolates to the CfI and vice versa.

Of the 1089 cases of pneumococcal meningitis identified in England and Wales between 2001 and 2004, 237 (21.8%) were identified through reporting to LabBase alone, 666 (61.2%) were identified following both reporting to LabBase and submission of the corresponding isolate and 186 (17.1%) were identified following submission of an isolate without the case having been reported to LabBase. The numbers of cases in each calendar year were broadly similar, varying from 256 to 287.

Information on penicillin susceptibility was available for isolates from 887 (81.5%) of the 1089 cases ascertained. Of these results, 284 (32%) were available from LabBase alone, 277 (31.2%) were from CfI alone and 326 (36.8%) were available from both the sources. Among results both reported to LabBase and available from CfI, 320 (98.2%) were in agreement. Of the six discrepancies noted, four results were for isolates reported to LabBase as susceptible but found to show intermediate resistance when tested in the Reference Laboratory (three required penicillin MICs of 0.125 mg/L and one required an MIC of 1 mg/L) and two were for isolates reported as resistant but found to be susceptible when tested in the Reference Laboratory. By pooling these results and taking the MIC result produced by the Reference Laboratory as the definitive value when there were discrepancies, 41 (4.6%) of the 887 isolates for which susceptibility data were available showed reduced susceptibility to penicillin. The proportions of isolates that showed reduced susceptibility to penicillin in the four calendar years, from 2001 to 2004, were 3.9% (9/231), 4.5% (11/243), 6.8% (16/236) and 2.8% (5/177), respectively.

Information on cefotaxime susceptibility was available for isolates from 743 (68.2%) of the 1089 cases ascertained. Of these results, 140 (18.8%) were available from LabBase alone, 445 (59.9%) were from CfI alone and 158 (21.3%) were available from both the sources. Resistance was only seen in one isolate (0.1%), which had been reported to LabBase as susceptible but was found to be resistant (MIC 2 mg/L) when tested in the Reference Laboratory. One other isolate was reported to LabBase as resistant, but was found to be susceptible when tested in the Reference Laboratory. In terms of other first-line agents, 1 of the 668 isolates (0.2%) for which results were available was resistant to rifampicin and none of 677 isolates for which results were available was resistant to vancomycin.

Although susceptibility data were not available for isolates from all the cases of meningitis identified, there is no reason to believe that the isolates for which results were available were unduly unrepresentative. Indeed, given that a not uncommon reason for referral of pneumococci to the Reference Laboratory was for confirmation of penicillin resistance, it may be that the overall rate of penicillin resistance observed (4.6%) is a slight overestimate.

The data presented here indicate that penicillin remains a treatment option for >95% of cases of pneumococcal meningitis in England and Wales once susceptibility has been confirmed by laboratory testing, though empirical usage cannot be advocated. For the minority of cases where reduced susceptibility to penicillin is noted, treatment with cefotaxime (or ceftriaxone), either alone or in combination with vancomycin or rifampicin, remains an option, as resistance to these agents remains rare. Moreover, the low rates of resistance to these latter agents confirm their continued suitability as first-line agents for empirical treatment of pneumococcal meningitis.
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Transparency declarations

None to declare.

References


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