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Antimicrobial susceptibility of invasive *Neisseria meningitidis,* 2017

The antimicrobial susceptibility of all 74 viable meningococcal isolates received at ESR from cases of invasive disease in 2017 was tested. Ceftriaxone, ciprofloxacin, penicillin and rifampicin minimum inhibitory concentrations (MICs) were determined by Etest on Mueller-Hinton agar + 5% sheep blood. MICs were interpreted according to the Clinical and Laboratory Standards Institute (CLSI) breakpoints.[1] Note that in reports for previous years, meningococci with penicillin MICs of 0.12, 0.25 and 0.5 mg/L have been categorised as having reduced penicillin susceptibility or intermediate resistance. In this report we have applied the CLSI breakpoints. Therefore meningococci with penicillin MICs ≥0.5 mg/L are categorised as resistant and those with MICs of 0.12 and 0.25 mg/L are categorised as intermediate.

The 74 meningococcal isolates tested for susceptibility in 2017 included 43 group B isolates (including 17 belonging to the NZ B:P1.4 epidemic strain), 9 group C, 11 group W and 11 group Y isolates.

13.5% (10/74) of the isolates were categorised as penicillin resistant (ie, MIC ≥0.5 mg/L) (Table 1). The 10 penicillin-resistant isolates comprised five group C, four group W and one group B isolate.

54.1% (40/74) of the isolates were penicillin non-susceptible (ie, penicillin intermediate or resistant, with MICs ≥0.12 mg/L). The prevalence of penicillin non-susceptibility in each of the meningococcal groups was:

- 77.8% (7/9) of group C isolates;
- 63.6% (7/11) of group W isolates;
- 48.8% (21/43) of all group B isolates, including 5.9% (1/17) of the group B isolates belonging to the NZ B:P1.4 epidemic strain; and
- 45.5% (5/11) of group Y isolates.

One isolate was resistant to ciprofloxacin, with an MIC of 0.12 mg/L. The isolate was a group C meningococcus (C:P1.5,2) (Table 1).

All isolates were susceptible to ceftriaxone and rifampicin (Table 1).

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Table 1. Antimicrobial susceptibility, MIC range and MIC_{90} of *N. meningitidis* from invasive disease cases, 2017

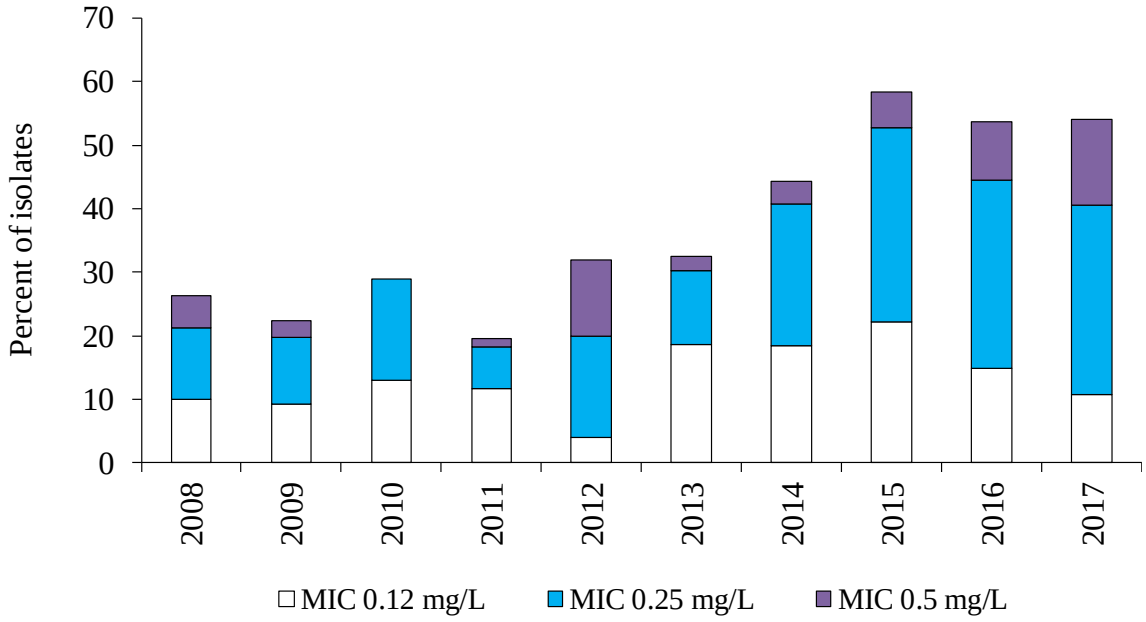
Antimicrobial	Percent (number)			MIC range (mg/L)	MIC_{90} (mg/L)
	Susceptible	Intermediate	Resistant		
penicillin	45.9 (34)[1]	40.5 (30)[1]	13.5 (10)[1]	0.016-0.5	0.5
ceftriaxone	100 (74)	-[2]	-[2]	<0.002-0.008	<0.002
rifampicin	100 (74)	0.0 (0)	0.0 (0)	0.008-0.25	0.06
ciprofloxacin	98.6 (73)	0.0 (0)	1.4 (1)	0.004-0.12	0.008

[1] penicillin susceptible, MIC ≤0.06 mg/L; intermediate, MIC 0.12-0.25 mg/L; resistant, MIC ≥0.5 mg/L

[2] there is no intermediate or resistant category for ceftriaxone

Over the last 10 years there has been a general trend of an increasing proportion of isolates non-susceptible to penicillin (Figure 1).

Figure 1. Penicillin-nonsusceptible *N. meningitidis* from invasive disease, 2008-2017



Rifampicin resistance is rare among meningococci from invasive disease in New Zealand. In total, seven rifampicin-resistant isolates have been identified: one group C (C:2a:P1.5-1,10-1) isolate in 2011, one group B (B:4:P1.19,15) isolate and one group C (C:2a:P1.5-1,10-8) isolate in 2009, one group B (B:4:P1.4) isolate in 2003, one group C (C:2b:P1.2) isolate in 1997, one group B (B:15:P1.7,16) isolate in 1992, and one group A isolate in 1986.

Ciprofloxacin resistance is also rare among meningococci from invasive disease in New Zealand, with the isolate identified in 2017 just the second ciprofloxacin-resistant meningococcus from invasive disease to be identified. The first isolate was identified in 2010 and was also a group C meningococcus (C:ns:P1.20,23-7).

No resistance to ceftriaxone has been identified among meningococci isolated from cases of invasive disease in New Zealand.

[1] Clinical and Laboratory Standards Institute. Performance standards for antimicrobial susceptibility testing. 27th ed. Wayne, USA: CLSI; 2017. CLSI supplement M100.