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Australian Gonococcal Surveillance Programme, 1 January to 31 March 2019

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Neisseria Network, Australia

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Introduction

The National Neisseria Network (NNN), Australia, comprises reference laboratories in each state and territory that report data on susceptibilities for an agreed group of antimicrobial agents for the Australian Gonococcal Surveillance Programme (AGSP). The antibiotics are penicillin, ceftriaxone, azithromycin and ciprofloxacin and represent current or potential agents used for the treatment of gonorrhoea. Ceftriaxone combined with azithromycin is the recommended treatment regimen for gonorrhoea in the majority of Australia. However, there are substantial geographic differences in susceptibility patterns in Australia, with certain remote regions of the Northern Territory and Western Australia having low gonococcal antimicrobial resistance rates. In these regions, an oral treatment regimen comprising amoxicillin, probenecid and azithromycin is recommended for the treatment of gonorrhoea. Additional data on other antibiotics are reported in the AGSP Annual Report. The AGSP has a programme-specific quality assurance process.

Keywords: Gonorrhoea, gonococcal, antimicrobial resistance, surveillance

Results

A summary of the proportion of isolates with decreased susceptibility to ceftriaxone (MIC ≥ 0.06 mg/L), and the proportion resistant to azithromycin (MIC ≥ 1.0 mg/L), penicillin (MIC ≥ 1.0 mg/L), and ciprofloxacin (MIC ≥ 1.0 mg/L) for Quarter 1 2019 are shown in Table 1.

Ceftriaxone

For the AGSP monitoring of ceftriaxone, decreased susceptibility (DS) includes the MIC values ≥ 0.06 mg/L, and is further differentiated by those isolates with MIC value 0.06 mg/L and those isolates with MIC values ≥ 0.125 mg/L. In the first quarter of 2019, the proportion of isolates with ceftriaxone DS in Australia was 1.89%, slightly higher than the annual proportion for 2018 as shown in Table 2. There were 3 isolates reported in the first quarter of 2019 in Australia with MIC ≥ 0.125 mg/L, and of these, 2 isolates had an MIC of 0.50 mg/L, which is the highest ceftriaxone MIC reported in the country since 2018.¹ There were 48 isolates with ceftriaxone DS (MIC value ≥ 0.06 mg/L), and of these 77.1% were resistant to penicillin and ciprofloxacin but

susceptible to azithromycin, as shown in Table 3. There were three isolates, all from New South Wales, with ceftriaxone MIC values of 0.06 mg/L that were resistant to azithromycin, penicillin and ciprofloxacin.

The national trend of isolates with ceftriaxone decreased susceptibility (MIC 0.06 and ≥ 0.125 mg/L) since 2012 is shown in Table 2.

A summary of ceftriaxone DS strains that were penicillin and ciprofloxacin resistant, or isolated from extragenital sites (rectal and pharyngeal) for Quarter 1, 2019, by state or territory, and by sex (male/female), is shown in Table 3.

Table 1: Gonococcal isolates showing decreased susceptibility to ceftriaxone, and resistance to azithromycin, penicillin, and ciprofloxacin, Australia, 1 January to 31 March 2019, by state or territory.

State or territory	Number of isolates tested	Decreased susceptibility		Resistance					
		Ceftriaxone MIC ≥ 0.06 mg/L		Azithromycin MIC ≥ 1.0 mg/L		Penicillin ^a MIC ≥ 1.0 mg/L		Ciprofloxacin MIC ≥ 1.0 mg/L	
		n	%	n	%	n	%	n	%
Australian Capital Territory	45	0	0	4	8.9	9	20.0	12	26.7
New South Wales	938	22	2.3	71	7.6	273	29.1	309	32.9
Queensland	425	4	0.9	6	1.4	86	20.2	115	27.1
South Australia	112	5	4.5	7	6.3	20	17.9	41	36.6
Tasmania	11	1	9.1	0	0.0	2	18.2	2	18.2
Victoria	725	10	1.4	59	8.1	122	16.8	184	25.4
Northern Territory non-remote	11	0	0	0	0	2	18.2	1	9.1
Northern Territory remote	25	0	0	0	0	0	0	0	0
Western Australia non-remote	212	6	2.8	2	0.9	43	20.3	54	25.5
Western Australia remote	27	0	0	0	0	0	0	2	7.4
AUSTRALIA	2531	48	1.9	149	5.9	557	22.0	720	28.4

a Penicillin resistance includes MIC value of ≥ 1.0 mg/L, or penicillinase production.

Table 2: Percentage of gonococcal isolates with decreased susceptibility to ceftriaxone (MIC 0.06 and ≥ 0.125 mg/L), Australia, 2012 to 2018, and 1 January to 31 March 2019.

Ceftriaxone MIC mg/L	2012	2013	2014	2015	2016	2017	2018	2019 Q1
0.06	4.10%	8.20%	4.80%	1.70%	1.65%	1.02%	1.67%	1.78%
≥ 0.125	0.30%	0.60%	0.60%	0.10%	0.05%	0.04%	0.06%	0.11%

Table 3: Percentage of gonococcal isolates with decreased susceptibility to ceftriaxone (MIC ≥ 0.06 mg/L) and that were penicillin (Pen) and ciprofloxacin (Cip) resistant (R), isolated from extragenital sites, and by sex, Australia, 1 January to 31 March 2019.

Strains with ceftriaxone decreased susceptibility (CRO DS)									
State or territory	Total	Pen R + Cip R		Males		Females		Extragenital sites	
		n	%	n	%	n	%	n	%
Australian Capital Territory	0	0	0	0	0	0	0	0	0
New South Wales	22	19	86	14	64	8	36	8	36
Queensland	4	3	75	4	100	0	0	2	50
South Australia	5	1	0	4	80	1	20	1	20
Tasmania	1	1	100	1	100	0	0	1	100
Victoria	10	8	80	6	60	3	30	4	40
Northern Territory non-remote	0	0	0	0	0	0	0	0	0
Northern Territory remote	0	0	0	0	0	0	0	0	0
Western Australia non-remote	6	5	83	4	67	2	33	1	17
Western Australia remote	0	0	0	0	0	0	0	0	0
AUSTRALIA	48	37	77.1	33	68.8	14	29.2	17	35.4

Azithromycin

In the first quarter of 2019, the proportion of isolates with resistance to azithromycin (MIC ≥ 1.0 mg/L) in Australia was 5.9%, slightly lower than the proportion reported nationally in 2018, but more than double the proportion reported in Australia for 2013–2015 (2.1–2.6%) (Table 4).² Globally there have been increasing reports of azithromycin resistance in *N. gonorrhoeae*.³

In quarter 1 2019, all states reported isolates with resistance to azithromycin, with the exception of Tasmania, Northern Territory and remote

Western Australia. The states that reported an increase in the proportion of *N. gonorrhoeae* isolates with resistance to azithromycin when compared with 2018 were New South Wales and South Australia. As noted above, there were three isolates that exhibited resistance to azithromycin and DS to ceftriaxone (MIC = 0.06 mg/L) and additionally were resistant to penicillin and ciprofloxacin. There were no isolates in this quarter that exhibited high-level resistance to azithromycin (MIC ≥ 256 mg/L).

The national trend of azithromycin resistance in isolates since 2012 is shown in Table 4.

Table 4: Percentage of gonococcal isolates with resistance to azithromycin (MIC \geq 1.0 mg/L), Australia, 2012 to 2018, and 1 January to 31 March 2019.

Azithromycin Resistance	2012	2013	2014	2015	2016	2017	2018	2019 Q1
MIC \geq 1 mg/L	1.3%	2.1%	2.5%	2.6%	5.0%	9.3%	6.2%	5.9%

Dual therapy using ceftriaxone plus azithromycin is the recommended treatment for gonorrhoea as a strategy to temper development of more widespread resistance. Patients with infections in extragenital sites, where the isolate has decreased susceptibility to ceftriaxone, should have repeat testing by nucleic acid amplification test for test of cure.⁴ Continued surveillance to monitor *N. gonorrhoeae* with elevated MIC values, coupled with sentinel site surveillance in high-risk populations, remains important to inform therapeutic strategies; to identify incursion of resistant strains; and to detect instances of treatment failure.

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