

MENINGOCOCCAL ISOLATE SURVEILLANCE, AUSTRALIA, 1995

The National Neisseria Network¹

Abstract

In 1995 the National Neisseria Network examined 250 strains of *Neisseria meningitidis* isolated from invasive cases of meningococcal disease throughout Australia. The majority of isolates were either serogroup B (166, 66%) or serogroup C (69, 28%). There were only two serogroup A isolates. The proportion of isolates of serogroup B meningococci increased in 1995 from 54% in 1994. Most cases of invasive disease occurred in those less than four years of age (43%), with another peak in the 15 - 24 years age group (26%). Outcome data were available in 190 instances and there were 13 deaths recorded (7%). Penicillin susceptibility of isolates was little changed and minimal inhibitory concentrations (MICs) ranged between 0.002 and 0.5 mg/L. One hundred and fifty-five isolates were in the 'less susceptible' range (MIC 0.06 - 0.5 mg/L). *Comm Dis Intell* 1996;20:422-424.

Introduction

A national program for the examination of strains of *Neisseria meningitidis* from cases of invasive meningococcal disease was commenced in 1994 with the cooperation and participation of reference laboratories in each State and Territory.

This laboratory-based surveillance was designed to supplement data from existing clinical notification schemes by adding information on the serogroup of strains and antibiotic sensitivity data.

A report providing information gathered in the first year of the program was published in *Communicable Diseases Intelligence*¹.

The following report deals with the calendar year 1995.

Geographic distribution of serogroups

Two hundred and fifty invasive isolates of meningococci were examined in 1995 (Table 1). The serogroup was not

Figure. *Neisseria meningitidis* isolates, 1995, by age group and sex

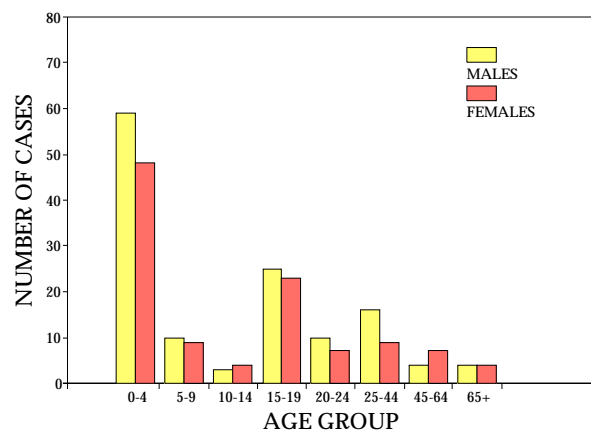


Table 1. *Neisseria meningitidis* isolates, 1995, by State or Territory and serogroup

State or Territory	Serogroup							Total
	B	C	A	Y	W135	NG ¹	Other ²	
ACT	5	1	1	1		1		9
NSW	40	16		1		1		58
NT		1						1
Qld	37	23	1				1	62
SA	11	5		1	1			18
Tas	3	2				1	2	8
Vic	38	18				2		58
WA	32	3			1			36
TOTAL	166	69	2	3	2	5	3	250

1. NG = Non-groupable

2. Strains not available

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determined for five isolates. Serogroup B strains predominated in all States. There was a considerable reduction in the number of serogroup C isolates in New South Wales from 34 in 1994 to 16 in 1995. The marked predominance of serogroup B in Western Australia was again evident. Two isolates only of serogroup A were found, three of serogroup Y and two of serogroup W135.

Age group and sex

The age and sex distribution of patients infected with invasive isolates is shown in the Figure. The peak incidence of meningococcal disease occurred in those four years of age and under. There were 56 cases (22%) in those less than one year of age and 50 (20%) in the 1 - 4 years age group. Another peak was in the 15 - 24 years age group with 65 cases (26%). These findings showed a typical distribution of meningococcal disease.

Site of isolation

It is recognised that site of isolation of the organism is an inadequate classification as it probably underestimates the number of cases of meningitis where there was no lumbar puncture or where lumbar puncture was delayed and culture was sterile.

While other indicators may suggest meningitis in the absence of a positive cerebrospinal fluid (CSF) culture, and have been provided by respondents, in the interests of uniformity the above approach was used.

Within the limitations noted above, CSF isolates (either alone or with a blood culture isolate) totalled 116 (from 67 males and 49 females). This was fewer than the 133 blood culture isolates (from 69 males and 64 females) without culture of the organism from CSF.

Outcome

Outcome data (survived or died) were available for 190 of the 250 cases.

In cases of meningococcal meningitis, outcome data were available for 89 patients (Table 2). There were five deaths (6%).

In septicaemic patients where information on outcome was available, 8 of 101 (8%) patients died (Table 3).

Antibiotic susceptibility

Considerable interest has been shown in the decrease in sensitivity of meningococci to penicillin in recent years. Strains with these characteristics have now been found in

many parts of the world. Also, sporadic reports of beta-lactamase producing meningococci continue to appear².

Other isolates have also been shown to be resistant to other antibiotics currently used either therapeutically or prophylactically in meningococcal disease. This program therefore undertakes routine surveillance of the antibiotic susceptibility of invasive isolates.

Penicillin

In the absence of accurate correlations between clinical response and in vitro sensitivity data in meningococcal disease, it is not possible to provide precise definitions of what constitutes a penicillin 'resistant' meningococcus.

Minimal inhibitory concentration (MIC) data are method dependent and not necessarily directly comparable when different techniques are used. This program uses the following parameters to define the various levels of penicillin susceptibility or resistance when determined by a standardised agar plate dilution technique:

sensitive: MIC ≤ 0.03 mg/L;

less sensitive: MIC 0.06 - 0.5 mg/L;

relatively resistant: MIC ≥ 1 mg/L.

Strains with MICs which place them in the category of 'sensitive' or 'less sensitive' would be considered to be amenable to penicillin therapy when used in currently recommended doses.

Using these criteria, 92 of the 247 (37%) invasive isolates tested were sensitive and 155 (63%) less sensitive to penicillin. The MICs ranged from 0.002 to 0.5 mg/L. This compares with 1994, where 102 of 214 (48%) isolates were fully sensitive and 112 (52%) less sensitive to penicillin with the MIC range 0.008 to 0.25 mg/L.

Other antibiotics

All 245 isolates tested were sensitive to ceftriaxone (and by extrapolation to other third-generation cephalosporins), rifampicin and ciprofloxacin. The latter two antibiotics are prophylactic, not therapeutic agents. A single isolate from New South Wales had a raised MIC to chloramphenicol.

Sulphonamide testing was not performed. Preliminary data indicated a significant amount of resistance to this agent in local isolates. This agent is no longer used in the treatment of this disease.

Table 2. Outcome of cases with meningitis, by serogroup

Serogroup	B	C	Y	U ¹	Total
Survived	58	22	3	1	84
Died	4	1			5
TOTAL	62	23	3	1	89

1. Not serogrouped.

Table 3. Outcome of cases with septicaemia, by serogroup

Serogroup	B	C	W135	NG ¹	Total
Survived	64	23	2	4	93
Died	5	3			8
TOTAL	69	26	2	4	101

1. Non groupable

Acknowledgements

Isolates were received in the reference centres from many laboratories throughout Australia. The considerable time and effort involved in forwarding these strains is recognised and their efforts are greatly appreciated. These data could not have been provided without this assistance and the help of colleagues and public health personnel.

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References

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2. Vazquez JA, Enriquez AM, de la Fuente L, Berron S, Baquero M. Isolation of a strain of beta-lactamase-producing *Neisseria meningitidis* in Spain. *Eur J Clin Microbiol Infect Dis* 1996;15:181-187.

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