2.3 Invasive Group A Streptococcal Disease

Summary

Number of cases, 2008: 68

Crude incidence rate, 2008: 1.60 per 100,000 population

Notifications

Sixty-eight cases of invasive Group A streptococcal (iGAS) disease were notified in 2008. This corresponds to 1.60 iGAS cases per 100,000 population (95% confidence interval, 1.25 to 2.03 per 100,000) and represents an increase when compared to 2007 when the iGAS rate was 1.34 per 100,000 population (95% CI, 1.02 to 1.74 per 100,000).

Of the 68 cases:

- 66 were confirmed - defined as patients with group A Streptococcus (GAS), or *Streptococcus pyogenes*, isolated from a sterile site
- one was probable - defined as a clinically compatible case and meeting the probable laboratory criteria for streptococcal toxic shock syndrome (STSS), i.e., isolated from a non-sterile site such as the throat or vagina
- one was not specified (in an 18 month old male with no clinical details provided)

Patient demographics

Of the 68 cases, 36 (53%) were males and 32 (47%) were females, with ages ranging from 10 months to 89 years. The age and sex specific rates of iGAS cases are shown in Figure 1. Children aged up to 9 years and adults aged over 55 years were most affected.

Geographic spread and seasonal variation

Table 1 outlines the numbers and crude incidence rates (CIRs) of iGAS disease by HSE area from 2004 to 2008. Of note, the highest number of cases in 2008 occurred in the HSE-E (n=31) while the highest CIRs were in the HSE-NE (2.5 per 100,000 population) and the HSE-W (2.4 per 100,000 population).

Although the numbers of iGAS notified to date have been low and it is not possible to discern distinct seasonal variations, the majority of notifications to date have been made during the first half of the year (data not shown). In 2008, the majority of cases (n=36) occurred in the first four months of the year.

Enhanced surveillance data

Enhanced data fields were entered for 48 (71%) of the 68 cases reported in 2008, compared with 70% (40 of 57 cases) in 2007. Of the 48 cases for which enhanced data were available, there was a wide variation in the fields completed. Thirteen laboratories were identified as the source for 39 cases.

Isolate details

GAS was isolated from a sterile site from 39 of 48 cases for which enhanced data were available, primarily from blood cultures (33 isolates, or 85%) but also abscesses (3), deep tissue (2) and joint (1).

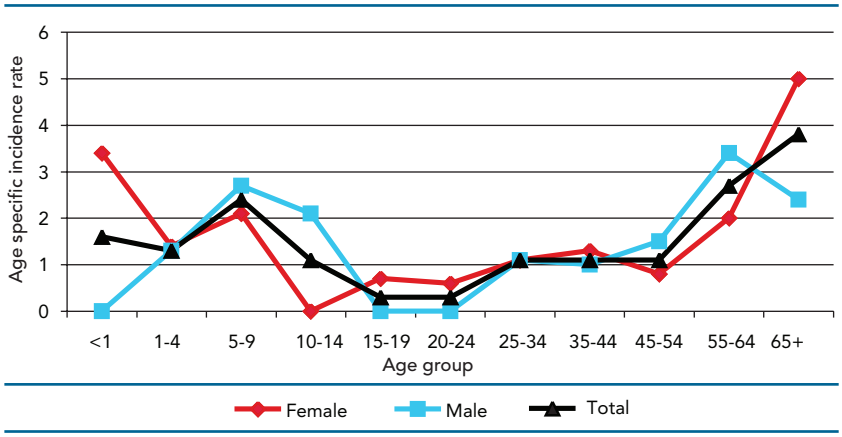

Figure 1. Age and sex specific rates of iGAS disease in 2008

No serological typing data, based on the detection of M and T-proteins, were available. This is predominantly due to the absence of a streptococcal reference laboratory in this country and thus laboratories are required to send their isolates to reference facilities abroad.

Clinical details
As in 2007 and previous years, bacteraemia (35 cases, including cases where bacteraemia was not specifically stated but GAS was isolated from blood) and cellulitis (17) were the most common clinical presentations, followed by pneumonia (6), septic arthritis (6), streptococcal toxic shock syndrome (STSS) (7; 2 of which were implied based on the clinical presentation given), necrotising fasciitis (4), puerperal sepsis (3), meningitis (2) and myositis (2). Note that cases could have more than one clinical presentation. Table 2 outlines the clinical syndromes associated with the 35 cases for which data on clinical presentation were provided:

Risk factors
Risk factors associated with iGAS disease included the following:
- age over 65 years (18)
- skin and wound lesions (11)
- diabetes (5)
- steroid use (4)
- malignancy (3)
- non-steroidal anti-inflammatory drugs (NSAID) (3)
- intravenous drug use (IVDU) (2)
- varicella infection (2)
- alcoholism (1)

Note that cases could have one or more associated risk factors. No risk factors were identified for 38 cases. Among the seven cases with STSS, age over 65 years was identified as a risk factor in four cases, NSAID use in two and steroid use diabetes, malignancy and skin lesions in one each. No risk factors were identified for two STSS cases.

Clinical management
Surgical intervention was required for nine patients (compared to two in 2007), ranging in age from 26 to 76 years, with clinical presentations that included one or more of the following:
- necrotising fasciitis (3) +/- myositis
- cellulitis (4)
- septic arthritis (2)

Admission to the intensive care unit was required for seven patients (compared to five in 2007), ranging in age from 5 to 77 years, with clinical presentations that included one or more of the following:
- bacteraemia and STSS (3) [one with pneumonia]
- bacteraemia and necrotising fasciitis (1)
- STSS and necrotising fasciitis (1)
- bacteraemia and pneumonia (1)

Table 1. Numbers (n) and Crude Incidence Rates (CIRs) per 100,000 population of iGAS disease by HSE area, 2004-2008.

HSE Area	2004		2005		2006		2007		2008	
	n	CIR	n	CIR	n	CIR	n	CIR	n	CIR
HSE-E	25	1.7	19	1.3	37	2.5	28	1.9	31	2.1
HSE-M	0	0.0	1	0.4	2	0.8	0	0.0	0	0.0
HSE-MW	1	0.3	3	0.8	2	0.6	2	0.6	1	0.3
HSE-NE	1	0.3	3	0.8	5	1.3	3	0.8	10	2.5
HSE-NW	0	0.0	3	1.3	1	0.4	3	1.3	3	1.3
HSE-SE	7	1.5	1	0.2	4	0.9	10	2.2	8	1.7
HSE-S	1	0.2	1	0.2	3	0.5	4	0.6	5	0.8
HSE-W	0	0.0	18	4.3	7	1.7	7	1.7	10	2.4
IRELAND	35	0.8	49	1.2	61	1.4	57	1.3	68	1.6

Length of ICU stay was provided for four cases: 2, 3, 7 and 10 days. Surgical intervention was required for the two patients with necrotising fasciitis.

Other epidemiological information
One case (puerperal sepsis in a 31 year old female) was reported as having been hospital-acquired compared to none in 2007. As in 2007, no outbreaks of iGAS were notified in 2008.

Outcome
Outcome at 7-days following GAS isolation was reported for 27 cases:
- 26 were still alive (including the probable case)
- one patient died (age 84 years, with diabetes, steroid and NSAID use and presenting with STSS)

In addition to the above:
- three cases (ages 16, 46 and 52 years) were reported to have died but it was not stated if these deaths were directly attributable to iGAS
- four cases were still ill at the time of reporting to CIDR and their final outcome was not ascertained

Of the seven STSS cases, one patient died resulting in a case fatality rate (CFR) of 14%, while four were still ill or recovering and one was recovered. No final outcome was provided for one patient, but was alive after 7 days.

The case fatality rate (CFR) for outcome from iGAS disease reported at 7-days in 2008 was 4%, a decrease from 19% (five deaths) in 2007.

Antimicrobial susceptibility
Antimicrobial susceptibility data were reported on 38 iGAS isolates (37 from blood and one from a joint fluid) by ten laboratories in 2008. All isolates were susceptible to penicillin (n=37), clindamycin (n=5) and vancomycin (n=31). Resistance to erythromycin was reported in three of 30 (10%) isolates and to tetracycline in one of 12 (8%) isolates.

Conclusion
In 2008, there were 11 more cases of iGAS reported in Ireland than in the previous year, an increase of almost 20%. This could be a genuine increase in the incidence of iGAS or could represent better reporting

Table 2. Clinical syndromes of 35 patients with iGAS disease in 2008

- bacteraemia, cellulitis, myositis and necrotising fasciitis (1)
- bacteraemia, cellulitis, pneumonia and STSS (1)
- bacteraemia, meningitis, septic arthritis and STSS (1)
- bacteraemia, cellulitis and meningitis (1)
- bacteraemia, pneumonia and STSS (1)
- bacteraemia, cellulitis and STSS (1)
- bacteraemia, myositis and necrotising fasciitis (1)
- bacteraemia and pneumonia (1)
- bacteraemia and cellulitis (7)
- bacteraemia and septic arthritis (2)
- bacteraemia and STSS (1)
- cellulitis and necrotising fasciitis (1)
- necrotising fasciitis and STSS (1)
- pneumonia and STSS (1)
- bacteraemia without a focus (5)
- cellulitis (3)
- puerperal sepsis (3)
- septic arthritis (3)

of this disease, which only became notifiable in Ireland as of 2004. The number of cases notified in Ireland still remains low compared to other Northern European countries and the US. Data reported to the Strep-Euro Program for 2003 and 2004 showed that the highest rates of iGAS disease were in Northern Europe with age-standardised rates of 3.31 and 3.10 per 100,000 population in the UK and Sweden, respectively. The estimated rate of iGAS disease in the US in 2008 [provisional data from CDC's Active Bacterial Core Surveillance (ABCS) Program] was 3.8 per 100,000 population while the mortality rate was 0.5. Certain serotypes of GAS are known to be more virulent than others, e.g. serotypes M1 and M3, but in the absence of a streptococcal reference laboratory in this country, no serological typing data are available to investigate such a link between Irish isolates and severity of disease. While enhanced data were available for 71% of cases, improved completion of the enhanced questionnaire for all cases will further augment our understanding of iGAS disease in Ireland.

HPSC thanks the microbiology laboratories for their contribution to date and encourages those that do not, to complete enhanced data forms and to submit antimicrobial susceptibility data on all iGAS cases along with their EARSS quarterly returns.

The figures presented in this summary are based on data extracted from the Computerised Infectious Diseases Reporting (CIDR) System on 22nd August 2009.

Further information on iGAS disease in Ireland including national guidelines is available at: http://www.ndsc.ie/hpsc/A-Z/Other/GroupAStreptococcalDiseaseGAS/