INVASIVE GROUP A STREPTOCOCCUS (IGAS)

**DESCRIPTION**

Invasive Group A Streptococcal (IGAS) disease is caused by the group A beta-hemolytic *Streptococcus pyogenes* bacterium. Transmission is by direct or, rarely, indirect contact. Illness manifests as various overlapping clinical syndromes including bacteremia without focus, sepsis, cutaneous wound or deep soft-tissue infection, septic arthritis, and pneumonia. It is the most common cause of necrotizing fasciitis, commonly known as “flesh eating bacteria.” IGAS occurs in all age groups but more frequently among the very old. Infection can result in severe illness, including death.

For surveillance purposes in LAC, IGAS is defined as isolation of *S. pyogenes* from a normally sterile body site (e.g., blood, cerebrospinal fluid, synovial fluid, or from tissue collected during surgical procedures), or also a non-sterile site if associated with streptococcal toxic shock syndrome (STSS) or necrotizing fasciitis (NF). IGAS cases are characterized as STSS if the diagnosis fulfills the CDC or Council of State and Territorial Epidemiologists (CSTE) case definitions for this syndrome; and as NF if the diagnosis was made by the treating physician.

DISEASE ABSTRACT

- STSS clinical presentation and case fatality rate has substantially increased compared to previous years, most likely due to enhanced surveillance.
- No clusters or outbreaks were reported.

STRATIFIED DATA

**Trends:** The incidence rate of reported IGAS was 1.5 per 100,000 in 2004 (n=146). This is a 12% decline in incidence as compared to 2003 (1.7 per 100,000, n=157) (Figure 1).
Seasonality: No seasonal trend was apparent. Aside from January, the number of cases remained relatively stable at a range of 9 to 15 per month (Figure 2).

Age: The age of cases ranged from 1 to 98 years with a mean 50 and median of 51.5 (crude data). The highest rate of cases occurred in the over 65 age group (4.3 per 100,000). No cases occurred in the <1 age group in 2004. There has been a striking decrease in incidence rates in this age group since at least 2001 (Figure 3).

Gender: Cases were evenly distributed between genders. The male to female rate ratio was 1.1:1. However, females comprised 66% of deaths due to IGAS infection (n=19).

Race/Ethnicity: Race/ethnicity was known for 91% of cases. Of these, 44% were White, 38% were Latino, 6% were Black, 8% were Asian, and 5% were other. The race/ethnicity distribution has remained similar since 2001.

Location: The crude incidence rate was highest in SPA 5 (2.5 cases per 100,000) compared to LAC overall (1.5 cases per 100,000) (Figure 4). However, the small number of cases reported in each SPA, except for SPAs 2 and 3, produces unstable incidence rates.

Clinical Syndromes: The most common syndromes presented were bacteremia and cellulitis (Table 1).

### Table 1. Frequency and Percentage of IGAS Clinical Syndromes, LAC, 2004

<table>
<thead>
<tr>
<th>Syndrome</th>
<th>Number</th>
<th>Percent*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bacteremia (without focus)</td>
<td>48</td>
<td>37</td>
</tr>
<tr>
<td>Cellulitis</td>
<td>43</td>
<td>33</td>
</tr>
<tr>
<td>STSS</td>
<td>17</td>
<td>13</td>
</tr>
<tr>
<td>Necrotizing Fasciitis</td>
<td>16</td>
<td>12</td>
</tr>
<tr>
<td>Non-Surgical Wound Infection</td>
<td>16</td>
<td>12</td>
</tr>
<tr>
<td>Pneumonia</td>
<td>15</td>
<td>12</td>
</tr>
<tr>
<td>Septic Arthritis</td>
<td>5</td>
<td>4</td>
</tr>
<tr>
<td>Other</td>
<td>42</td>
<td>32</td>
</tr>
</tbody>
</table>

*Overlapping syndromes will total over 100%.
Other syndromes included osteomyelitis, endometritis, and meningitis. There is a substantial increase in STSS, from a range of 2.4–6% in the past 7 years to 13% in 2004 (Figure 5). The case fatality rate has also risen from less than 10% since 2001 to 26%. This may be due to the rise in STSS as 42% of the reported deaths belonged to cases that presented with STSS (case fatality rate of STSS is 73% with two outcomes unknown).

The 17 cases of STSS ranged from 2–83 years in age; the mean was 49 and the median was 47. A majority of cases were female (65%). The most frequently reported risk factors for these cases are history of blunt trauma (n=4, 24%) and diabetes (n=3, 18%).

**Risk Factors:** Information about risk factors was collected for 74% of cases. Of these cases, roughly one-third reported no risk factors for IGAS (n=35), a third reported a single risk factor (n=39), while another third reported multiple risk factors (n=34). The most common reported risk factor is diabetes (n=25, 23%), followed by malignancy (n=16, 15%) and chronic heart disease (n=15, 14%).

**COMMENTS**

Although IGAS disease is not a mandated reportable disease in California, LACDHS has required laboratories, hospitals, and healthcare providers to report IGAS disease since 1993. Surveillance has been predominately passive and information pertaining to patient demographics, clinical presentation, intervention, and outcome has often been incomplete. Complete IGAS reporting requires active case follow-up, particularly for STSS and NF as these syndromes require the most intense follow-up.

In 2002 a new IGAS form including a specific section for STSS reporting was developed and distributed to Infection Control Practitioners. Increased information about IGAS and its various clinical syndromes has been systematically collected since that time with increasing success. As an artifact of these changes, however, IGAS trends may have changed dramatically. The upswing in both case fatality and STSS, for example, may be attributed to the improved availability of clinical presentation data which was 89% of cases in 2004, compared with 58% in 2002 and 71% in 2003. There may also be a reporting bias towards IGAS cases with severe presentation and outcomes.

No outbreaks or clusters have been reported, though single cases meeting the case definition of “nosocomial” occurred in six different facilities. However, there has been no evidence of nosocomial spread.

*S. pyogenes* more commonly causes non-invasive disease that present as strep throat and skin infections. However, these diseases are not counted in our surveillance of invasive disease, therefore, the data presented in this report is an underestimate of all disease caused by *S. pyogenes* in LAC.

**ADDITIONAL RESOURCES**

For more information about IGAS visit:

- CDC – [www.cdc.gov/ncidod/dbmd/diseaseinfo/groupastreptococcal_g.htm](http://www.cdc.gov/ncidod/dbmd/diseaseinfo/groupastreptococcal_g.htm)
IGAS Publications:


REFERENCES