

## INVASIVE GROUP A STREPTOCOCCAL DISEASE, 1998

### BACKGROUND

Since recognition of the streptococcal toxic shock syndrome in 1987, reports of severe invasive disease due to *Streptococcus pyogenes*, also known as Lancefield group A streptococcus (GAS), have appeared with increasing frequency in the medical literature. Changes in virulence of circulating strains or changes in susceptibility of the population are theories that have been offered to account for the apparent increase and severity of streptococcal infections in recent years. Following a cluster of cases of severe invasive GAS disease in 1993, the Acute Communicable Disease Control Unit requested reporting of invasive GAS disease by hospitals and health-care providers in Los Angeles County (LAC). Invasive GAS disease is not a mandated reportable disease in California.

### METHODS

Invasive GAS disease is defined as infection associated with the isolation of GAS from a normally sterile site and includes three overlapping clinical syndromes: (1) streptococcal toxic shock syndrome (STSS), characterized by early shock and multiorgan system failure; (2) necrotizing fasciitis (NF), characterized by necrosis of subcutaneous soft tissue and skin with signs of severe systemic disease; and (3) a group of infections that do not meet the criteria for STSS or NF, including bacteremia without a focus of infection and focal infections (e.g., meningitis, pneumonia, peritonitis, osteomyelitis, septic arthritis, cellulitis, and surgical wound infection) with or without bacteremia.

During 1994 and most of 1995, surveillance for invasive GAS disease relied mainly on passive reporting from hospitals and health care providers. From September 1995 to July 1996, the Communicable Disease Active Surveillance Project (CDAS) conducted active surveillance for invasive GAS disease, along with several other infectious diseases of public health importance, in virtually all acute care hospitals and laboratories in LAC. Since July 1996, surveillance for invasive GAS disease has consisted of a combination of passive reporting by health care providers and active surveillance, principally laboratory-based through the CDAS Project, in approximately 60% of laboratories and hospitals in LAC.

### RESULTS

In 1998, 128 cases of invasive GAS disease were reported, for a crude incidence rate of 1.5 cases per 100,000 population. This compares with 83 cases in 1994, 103 cases in 1995, 175 cases in 1996, and 205 in 1997 (Table 1). Of 52 cases for which outcome was known, there were 14 deaths, for an estimated case-fatality rate of 27%. The frequency of total invasive GAS cases, STSS and NF for 1994-1998 are shown in Table 1.

**Table 1. Frequency of Invasive GAS, NF and STSS  
Los Angeles County, 1994-1998**

Year	Total Invasive GAS Cases	STSS		NF	
		N	(%)	N	(%)
1994	83	29	(35)	18	(22)
1995	103	16	(16)	17	(17)
1996	175	9	(5)	13	(7)
1997	205	7	(3)	9	(4)
1998	128	8	(6)	13	(10)

**Focus of Infection:** The majority (61%) of invasive GAS cases involved bacteremia without an identified focus of infection (Table 2).

**Table 2. Focus of Infection of Invasive GAS Disease Cases  
Los Angeles County, 1998 (N = 128)**

Focus of Infection	No.	Percent
Bacteremia without other focus	78	61.0
Skin/soft tissue infection	31	24.1
Pneumonia	8	6.3
Meningitis	2	1.6
Bone/joint	3	2.3
Other	6	4.7

**Seasonality:** Cases occurred throughout the year but were more frequent during the late winter and early spring months (Figure 1). However, the pronounced winter/spring seasonality associated with noninvasive GAS infections was not observed.

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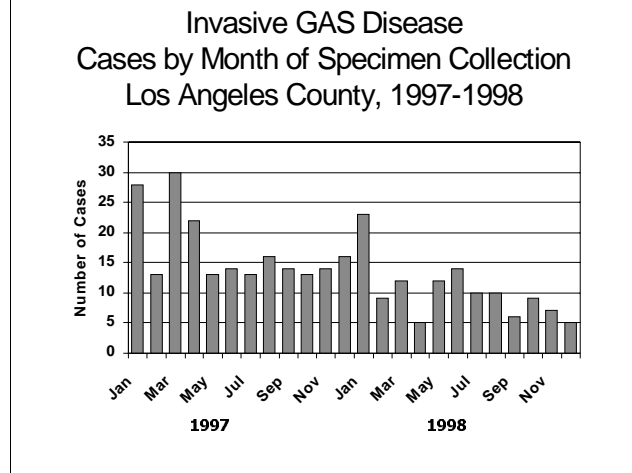
**Age, Gender:** The mean age of invasive GAS cases for which age data were available (n=116) was 47 years (median 50 years, range 2 months to 98 years). The highest incidence rate (6.0 cases per 100,000 population) occurred in adults 65 years and older. The male:female rate ratio was 1.2:1. Race/ethnicity data were available for only 56 cases. Of these, 20 (36%) were Hispanic, 24 (43%) were non-Hispanic White, 6 (11%) were Asian, and 6 (11%) were Black.

**Necrotizing Fasciitis:** NF was reported in 13 (10%) cases; 92% (12/13) were male. The mean age of NF cases was 46 years (median 47 years, range 23-78 years). Outcome was reported for 9 of the 13 NF cases. The NF case-fatality rate was 49% (4/9). Four patients with NF were also diagnosed with streptococcal toxic shock syndrome.

## COMMENTS

These data are subject to several limitations. First, changes in surveillance methods over the study period make meaningful year-to-year comparisons difficult. Completeness of invasive GAS reporting in LAC has not been assessed. The national incidence rate of invasive GAS disease is estimated at 4-5 cases per 100,000 population, compared to the LAC rate of 1.2 cases per 100,000 in 1998. Second, invasive GAS surveillance is mainly laboratory-based and detailed demographic and clinical data is rarely included on the initial report. Hospital record review of reported invasive GAS cases would have provided more complete data but was done for only a small number of cases. It is likely that the number of deaths and the occurrence of additional foci of infections in bacteremic cases are substantially underestimated.

Figure 1.



## REFERENCES

1. The Working Group on Severe Streptococcal Infections. Defining the group A streptococcal toxic shock syndrome. Rationale and consensus definition. *JAMA* 1993;269:390-1.
2. Peterson CL, Vugia DJ, Meyers HB, Chao SM, Vogt J, Lanson J, Brunell PA, Kim KS, Mascola L. Risk factors for invasive group A streptococcal infections in children with varicella: a case-control study. *Pediatr Infect Dis J.*1996;15:151-6.
3. Vugia DJ, Peterson CL, Meyers, HB, Kim KS, Arrieta A, Schlievert PM, Kaplan EL, Werner SB, Mascola L. Invasive group A streptococcal infections in children with varicella in Southern California. *Pediatr Infect Dis J.*1996;15:146-50.
4. American Academy of Pediatrics, Committee on Infectious Diseases. Severe invasive group A streptococcal infections: a subject review. *Pediatrics.* 1998;101:136-40.
5. Zurawski CA, Bardsley MS, Beall B, Elliott JA, Facklam R, Schwartz B, Farley MM. Invasive group A streptococcal disease in metropolitan Atlanta: a population-based assessment. *Clin Infect Dis* 1998;27:150-7.