

STREPTOCOCCAL TOXIC SHOCK SYNDROME (STSS)

REPORTING INFORMATION

- Class A(3)
- Report by the end of the work week
- [Confidential Case Report Card](#) (3812.11 rev. 12/81) or Telephone
- Requires completion of [Streptococcal Toxic Shock Syndrome Surveillance Report](#) (HEA 3823 rev. 6/98).
To be sent by the local health department to the Bureau of Infectious Disease Control, ODH, 246 N. High Street, PO Box 118, Columbus, OH 43266-0118.

AGENT

Streptococcus pyogenes (group A *Streptococcus*) - There are more than 80 serologically distinct types of *S. pyogenes* which may cause a variety of diseases ranging from relatively mild illnesses such as pharyngitis and impetigo to severe infections including septicemia and Streptococcal Toxic Shock Syndrome (STSS).

CASE DEFINITION

Clinical description

Streptococcal Toxic Shock Syndrome (STSS) is a severe illness associated with invasive or noninvasive group A streptococcal (*Streptococcus pyogenes*) infection. STSS may occur with infection at any site but most often occurs in association with infection of a cutaneous lesion. Signs of toxicity and a rapidly progressive clinical course are characteristic, and the case-fatality rate may exceed 50%.

Clinical case definition

An illness with the following clinical manifestations occurring within the first 48 hours of hospitalization or, for a nosocomial case, within the first 48 hours of illness:

- Hypotension: defined by a systolic blood pressure ≤ 90 mm Hg for adults or less than the fifth percentile by age for children aged <16 years.
- Multi-organ involvement - two or more of the following:
 1. Renal impairment: Creatinine ≥ 2 mg/dL (≥ 177 $\mu\text{mol/L}$) for adults or greater than or equal to twice the upper limit of normal for age. In patients with preexisting renal disease, a greater than two-fold elevation over the baseline level.
 2. Coagulopathy: Platelets $\leq 100,000/\text{mm}^3$ ($\leq 100 \times 10^6/\text{L}$) or disseminated intravascular coagulation, defined by prolonged clotting times, low fibrinogen level, and the presence of fibrin degradation products
 3. Liver involvement: Alanine aminotransferase [SGOT], aspartate aminotransferase [SGPT], or total bilirubin levels greater than or equal to twice the upper limit of normal for the patient's age. In patients with pre-existing liver disease, a greater than two-fold increase over the baseline level
 4. Acute respiratory distress syndrome (ARDS): defined by acute onset of diffuse pulmonary infiltrates and hypoxemia in the absence of cardiac failure or by evidence of diffuse capillary leak manifested by acute onset of generalized edema, or pleural or peritoneal effusions with hypoalbuminemia.
 5. A generalized erythematous macular rash that may desquamate.
 6. Soft-tissue necrosis, including necrotizing fasciitis or myositis, or gangrene.

Laboratory criteria for diagnosis

Isolation of group A *Streptococcus*

Case classification

Probable: a case that meets the clinical case definition in the absence of another identified etiology for the illness and with isolation of group A *Streptococcus* from a nonsterile site

Confirmed: a case that meets the clinical case definition and with isolation of group A *Streptococcus* from a normally sterile site (e.g., blood or cerebrospinal fluid or, less commonly, joint, pleural, or pericardial fluid)

Comment

See also [Streptococcal Disease, Invasive, Group A](#) and [Toxic Shock Syndrome](#)

SIGNS AND SYMPTOMS

See clinical description.

DIAGNOSIS

See case definition.

EPIDEMIOLOGY

Source

Group A streptococcal bacteria are commonly found in the throat and on the skin. Invasive group A streptococcal disease occurs when the bacteria invade parts of the body (blood, lungs, deep muscle, and fat tissue) where bacteria are not usually found. Epidemiologic data show an association between GAS invasive disease and GAS serotypes M1 and M3. Infection often begins at the site of a break in the skin (a surgical or non-surgical wound). Cases have also been associated with minor non-penetrating trauma and with varicella infections.

Occurrence

Prospective and retrospective population-based studies have established the incidence of invasive GAS disease as approximately four cases/100,000 population with an overall case-fatality rate of 15%-25%. Persons of all ages are affected. Risk groups have been defined by race/ethnicity (notably American Indians), underlying disease (varicella, diabetes mellitus, and HIV infection), and behaviors (IV drug use). For the most part, infections occur sporadically but clusters of invasive GAS infection and STSS have been reported in several settings including hospitals, nursing homes, families, and military training facilities (1994 National Surveillance Conference, Position Statement 7, Executive Committee). Community-wide outbreaks have also been reported.

It is estimated that 15% - 20% of invasive GAS cases are STSS with a fatality rate of 50% - 70%.

Mode of Transmission

Transmission is by direct contact with secretions from infected persons. There is some evidence that close contacts of a case (family/household members, health care providers, nursing homes) might be at an increased risk for infection with GAS. The same strain of GAS might cause different disease in different hosts ranging from asymptomatic or mild infection to invasive disease.

PUBLIC HEALTH MANAGEMENT

Case

Treatment

Early recognition of invasive GAS infections is important because of their potential for rapid progression and fatal outcome. Penicillin is effective for treating most GAS infections. More aggressive infections, however, do not respond as well to penicillin and it may be helpful to add clindamycin to the penicillin regimen. Where deep infection with invasive GAS is suspected, prompt and aggressive exploration and debridement are mandatory. Intravenous fluids and other supportive measures typically used in the management of shock and multi-organ failure are often necessary.

Isolation

The Ohio Administrative Code ([section 3701-3-13 \[Y\]](#)) states that "a person with a streptococcal infection shall be excluded from school or childcare center for twenty-four hours after the initiation of antimicrobial therapy".

Contact

There are no official recommendations for culture and therapy or prophylaxis for close contacts of persons with invasive GAS. However, because of evidence that close contacts of a case might have an increased risk of developing GAS, throat cultures and cultures of any lesions may be considered in those persons with close contact to the case, especially if contacts have severe underlying illness. Culture-positive persons should be treated.

Infection Control

The following guidelines for infection control in health care personnel have been published by the Centers for Disease Control and Prevention (CDC) and Hospital Infection Control Practices Advisory Committee (HICPAC) (*American Journal of Infection Control* 1998;26:289-354).

Patient-to-Personnel Transmission: Nosocomial spread of group A streptococci to personnel can be prevented by adherence to standard precautions or other transmission precautions. Personnel should wash their hands thoroughly after each patient contact, wear gloves when contact with potentially contaminated secretions is anticipated, and wear gowns when soiling with infective material is likely. Items contaminated by respiratory secretions or wound drainage should be disposed of in a proper manner. Secondary spread and illness in hospital personnel have occurred following direct contact by personnel with secretions from infected patients.

Personnel-to-Patient Transmission: Sporadic outbreaks of surgical wound infections or postpartum infections caused by group A streptococci have been associated with carriers among operating room or delivery room personnel. The main reservoirs of group A streptococci in implicated carriers are the pharynx, the skin, the rectum, and the female genital tract. Direct contact and airborne spread are the major modes of transmission in these settings. Since surgical wound infections or postpartum infections due to GAS occur infrequently, any isolate from cases should be saved for possible serotyping should an outbreak ensue. The occurrence of 2 or more cases should prompt an epidemiologic investigation and a search for a carrier-disseminator.

Restriction from patient care activities and food handling is indicated for personnel with GAS infections until 24 hours after they have received appropriate therapy. However, no work restrictions are necessary for personnel who are colonized with GAS unless they have been epidemiologically linked to transmission of infection within the facility.

Child Care/Preschools

The most important means of controlling any GAS disease is prompt identification and treatment of infections. Children with GAS infections should not return to child care/preschool until at least 24 hours after beginning antimicrobial therapy and until they are afebrile. Contacts of documented cases of streptococcal infection who have recent or current clinical evidence of GAS infection should have appropriate cultures taken and should be treated if the culture is positive.