Streptococcal Toxic Shock-like Syndrome

Key words: Streptococcus pyogenes, septic shock, multiple organ failure

Definition
Streptococcal toxic shock-like syndrome is a life-threatening septic shock caused by Streptococcus pyogenes (Group A Streptococcus: GAS). An informal working group on Severe Streptococcal Infections in the United States studied cases with symptoms of shock, multiple organ failure and destructive soft-tissue infection associated with GAS. The working group defined these obscure cases as Streptococcal Toxic Shock-like Syndrome (TSLS), and presented a diagnostic criteria in 1993 (1). In accordance with this criteria, the patient is diagnosed as TSLS, when GAS isolated from a normal sterile body site, and hypotension in combination with at least two of the following symptoms: renal impairment, liver involvement, adult respiratory distress syndrome (ARDS), disseminated intravascular coagulation (DIC) or soft tissue disorder such as rash or necrotizing fasciitis.

Epidemiology
In Japan, a Japanese working group concerned with severe streptococcal infectious diseases that was organized by the Ministry of Health and Welfare, detected ninety-seven cases of TSLS which met the criteria described above (2). These cases occurred between 1978 and 1997, and covered a widespread area of Japan. There were fifty-nine were males and thirty-eight females. The mean age of the patients was 51.2 years old, and ranged from 3 days and 83 years old. Death occurred in forty-seven cases (48.5%) even though most patients received antimicrobial therapy, intensive care and surgical debridement. Fifty-eight cases were complicated by other disease and it was necessary to continue medical care at the time when they experienced the symptoms of TSLS. Four cases involved stillbirth at delivery, where the mothers fell into severe shock and died.

Clinical features
Bacteremia and severe hypotension were common in all of the patients. However, the clinical features of TSLS varied from case to case. Many patients had pharyngitis, muscle pain and fever as preliminary symptoms for several days. The patients experienced sudden onset of advanced symptoms which included hypotension, tachypnea, dyspnea, vomiting, diarrhea and central nervous disorder such as irritability and stupor. Multiple organ failure developed very rapidly in the patients within a few hours.

Etiology
The cause of TSLS is not clear at this time. Mutation of organisms isolated from patients or production of a new exotoxin related to TSLS has not yet been found. In Japan, neither secondary infection nor prevalence of TSLS has been reported. These facts suggest that multiple factors induce TSLS in both the bacteria and the host. GAS are divided into categories based on antigenic differences in both the M protein (M-type) and T protein (T-type). There are at least eighty serotypes. In the isolated organisms, both T-1 and M-1, and T-3 and M-3 are significantly greater in number. Other organisms such as T-4, T-22, T-28, and T-B3264 were also isolated (3). All organisms were sensitive to antibiotics including of β-glucans.

See also p 266.

Treatment
Treatment or prevention for TSLS has not been established at this time. To maintain hemodynamics, a large infusion of fluid is necessary. Sometimes catecholamines are ineffective, and it is recommended that dopamine and dobutamine should be combined with this fluid therapy. GAS live in the necrotizing soft tissue at a high density, and abnormal soft tissue should be resected as thoroughly and as quickly as possible.

It is thought that penicillins should be the first choice against TSLS. Although some physicians recommend clindamycin, because of its anti-protein synthesis action, is thought to be more effective against severe bacteremia than penicillins (4). The effectiveness of immunoglobulin has also been reported (5).

Nosocomial Infection
When a patient is admitted to a hospital, prevalence of TSLS in a hospital has is not yet known. However, the patient with TSLS is the source of GAS infections. There is some risk to other patients and medical staff for infections of the respiratory tract and the wound, as a nosocomial infection. The patient with TSLS must be kept in isolation like patients infected with methicillin-resistant Staphylococcus aureus (MRSA).

In some cases, the organisms of the same serotype as isolated from the patient of TSLS, are found on pharynges of the family and friends. They should be informed that the secondary infection of TSLS is not reported. When family and friends have symptoms such as pharyngitis and fever, the patients should be given antibiotics to relieve the presented symptoms, not to prevent TSLS.
Surveillance

In Japan, since April 1999, the revised law for the prevention and control of infectious diseases was enacted. With this legal regulation, a physician who encounters a patient with TSLS, must report the clinical data to a public health center.

TSLS is a very rare disease, and that is an obstacle to proceed with the etiological study. The physician in charge of the patient with TSLS, is expected to voluntarily retain samples such as organisms, plasma and destructive tissue, isolated from the patient under an ethical code, and contact the secretariat of the Japanese working group: Asahi General Hospital (I-1326, Asahi City, Chiba. FAX+81-479-62-1620), and The Infectious Agents Surveillance Center: National Institute of Health (1-23-1, Toyama, Shinjyuku-ku, Tokyo. FAX+81-3-5285-1177).

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References