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Letter to the Editor

Emergence of STSS in Japan: An assessment of the threat and containment strategies

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Dear Editor,

Toxic Shock Syndrome (TSS) was first identified in the late 1970s and early 1980s. Initially linked to tampon use in menstruating women, it was later differentiated from Streptococcal Toxic Shock Syndrome (STSS), caused by Group A Streptococcus (GAS). The CDC established case definitions for STSS in the 1990s. In terms of epidemiology, the incidence of invasive GAS infections is approximately 2–3 cases per 100,000 population annually in developed countries. STSS accounts for a significant proportion due to its high mortality rate (30–70 % even with treatment). The condition shows seasonal variation, with a higher incidence in winter and early spring. Older adults and individuals with comorbid conditions are at higher risk. Currently, Japan is experiencing an outbreak of invasive GAS infections, including STSS and necrotizing fasciitis, with an unusually high number of severe cases in 2024 [1].

Streptococcal Toxic Shock Syndrome (STSS) and necrotizing fasciitis are typically caused by Group A Streptococcus (GAS). However, other bacteria, including *Staphylococcus aureus*, Clostridium, and Vibrio vulnificus, can also be responsible. These bacteria release toxins upon entering the body through minor cuts, scrapes, or burns. These toxins infect the tissue, impair blood flow, and manifest early symptoms such as swelling, redness, and fever at the site of infection. As the infection progresses, blisters may form, and the affected tissue can turn black. These symptoms can rapidly worsen within hours of infection [2,3]. The incidences increased from 60 to 70 to 143, and suspicion of the increase was due to the spread of specific genotypes, such as mefA-positive emm1. The most prevalent emm types between 2013 and 2018 were 1, 89, 12, and 3, with a notable increase observed in emm3 and 89. In 2017, Japan's National Institute of Infectious Diseases (NIID) reported the highest number of Group A Streptococcus (GAS) Toxic Shock Syndrome (TSS) cases. The National Institute of Infectious Diseases, which has been monitoring cases of the disease since 1999, reported that as of June 2, 2024 of this year, there had been 977 cases of streptococcal toxic shock syndrome (STSS) with a case fatality rate of 21.7 %. Particularly, this fatality rate was higher among individuals older than 50 by February 2024." [2] (Fig. 1).

Individuals with infections may exhibit blisters on the skin, darkened tissue, and tissue damage. Histopathological examination of the affected tissue can be performed to confirm the diagnosis of necrotizing fasciitis, and other methods for diagnosis include blood cultures, CT/MRI, PCT levels, CRP, and other measures. The hallmark of necrotizing fasciitis as seen in CT is the presence of gas within the tissue. Broad-spectrum antibiotics, necrotic tissue removal, fluid resuscitation, and pain control are among the available treatment options whereas the hyperbaric oxygen chamber can also be used as adjuvant treatment for Necrotizing fasciitis [3].

The ongoing outbreak in Japan underscores the significance of vigilant public health measures, prompt diagnosis, and proactive treatment. By comprehending the multifaceted factors contributing to the surge in invasive Group a Streptococcus (GAS) infections, we can develop effective strategies to mitigate the impact of this and future outbreaks. Penicillin's endure recommended for treatment of invasive Group a Streptococcus (GAS) infections. However, clindamycin and high-dose intravenous polyspecific immunoglobulin G (IVIG) are recommended as adjunctive therapy [3–5].

Disclosure statement

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Data availability statement

Data sharing does not apply to this article as no datasets were generated or analyzed during the current study.

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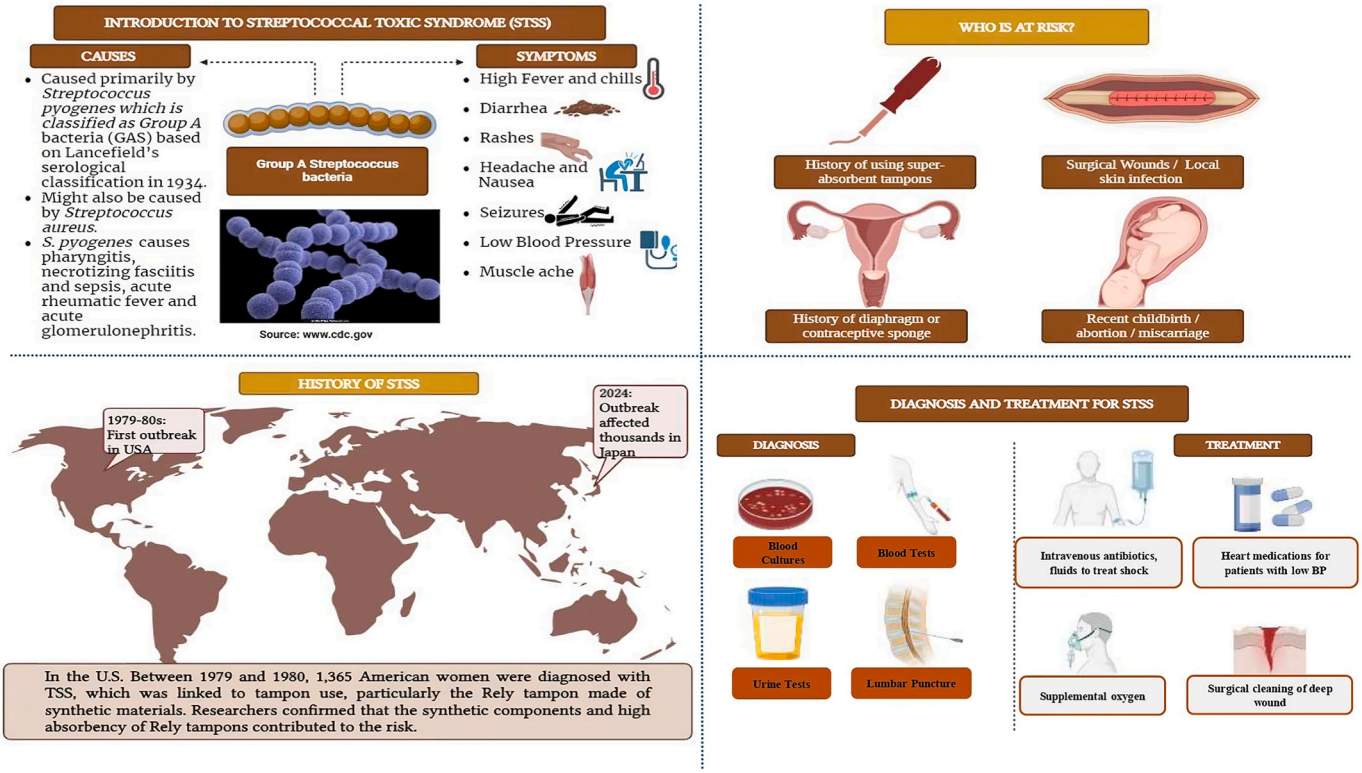

Fig. 1. Shows signs, symptoms, diagnosis and treatment of STSS.

Ethical approval

This article does not require any human/animal subjects to acquire such approval.

CRediT authorship contribution statement

Om Prakash Choudhary: Conceptualization, Formal analysis, Supervision, Writing – original draft, Writing – review & editing. **Rashmi Rana:** Conceptualization, Data curation, Writing – original draft, Writing – review & editing. **Priyanka:** Conceptualization, Data curation, Writing – original draft. **A. Babar Ali:** Conceptualization, Data curation, Writing – original draft. **Vyoma Sharma:** Conceptualization, Data curation, Writing – original draft, Writing – review & editing.

Declaration of competing interest

The authors declare the following financial interests/personal relationships which may be considered as potential competing interests:

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