

TSST-1 producing *Staphylococcus aureus* strains found in more men than women

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Abstract

S. aureus is an opportunistic bacteria present in the anterior nares of roughly one third of the human population. One of the toxins certain strains are known to produce is toxic shock syndrome toxin 1 (TSST-1). This can cause both menstrual and non-menstrual toxic shock syndrome (TSS), but is more widely known for the menstrual variation due to the high onset of TSS in women from high absorbency tampons in the 1980s. An analysis of survey data found that surprisingly more men carried *S. aureus* strains with the TSST-1 gene than women.

Survey Data

- 1277 swabs processed out of 1355 collected
- 318 of the processed swabs were positive for *S. aureus* (25%)
- 136 of the positive strains have been sequenced for toxin matches

TSST-1 Overview

- TSST-1 is a superantigen, specifically an exotoxin, that causes a release of cytokines that drop blood pressure
- Expression of TSST-1 requires elevated oxygen levels and neutral pH
- An estimated 90% of *S. aureus* strains associated with menstrual TSS and 50% associated with non-menstrual TSS produce TSST-1
- TSS symptoms include fever, rash, hypotension, and multi-organ dysfunction
- Incidence of TSS is around 0.8-3.4 per 100,000 in the U.S.
- Menstrual TSS is related to high absorbency tampons, while non-menstrual TSS can be acquired through post-surgical infections, burns, and dialysis catheters
- The mortality rate from menstrual TSS was 0% in 2000-2006, whereas for non-menstrual TSS it was 6%

Toxic shock syndrome toxin-1 (TSST-1) more prevalent in *Staphylococcus aureus* strains taken from men than from women

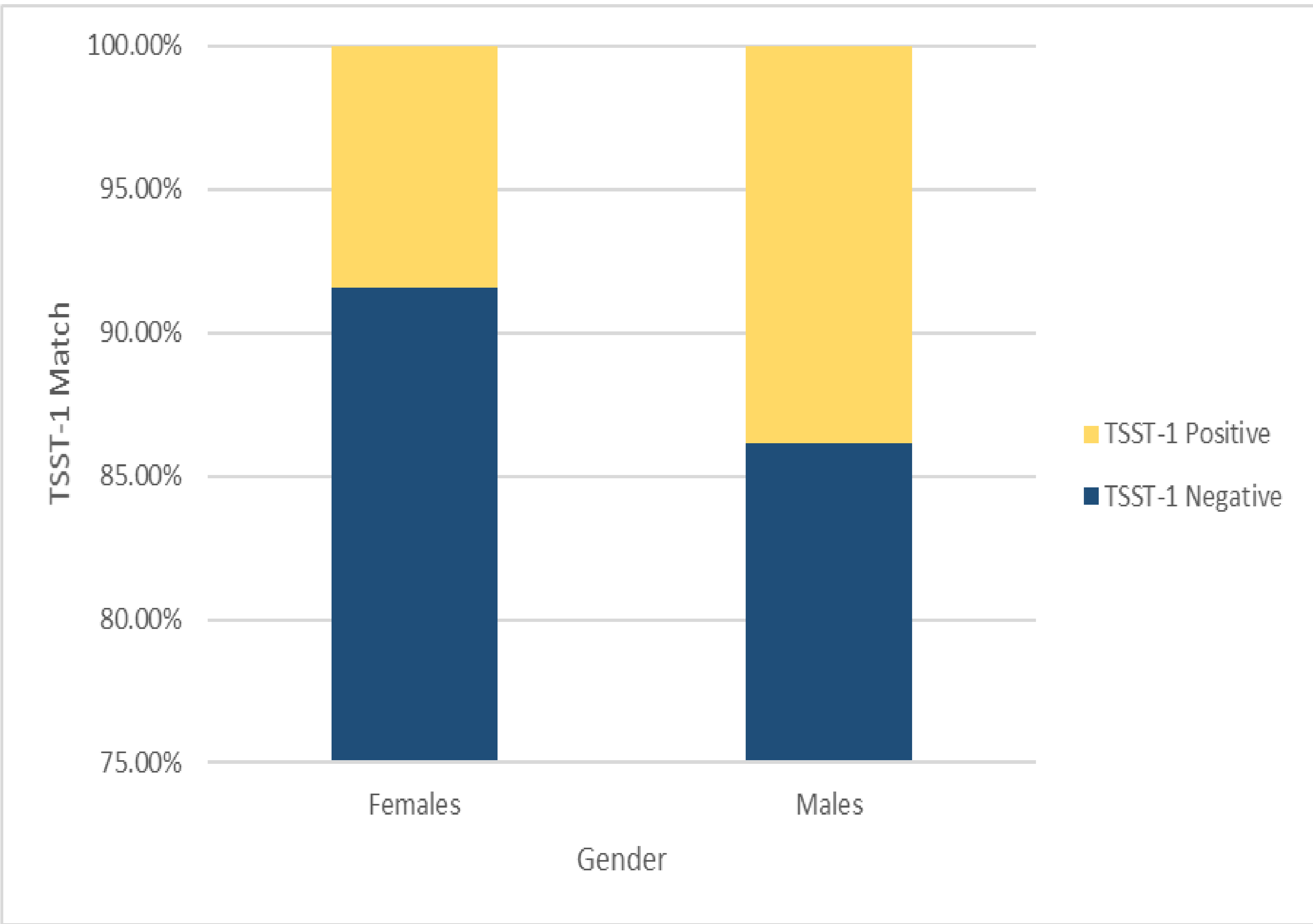
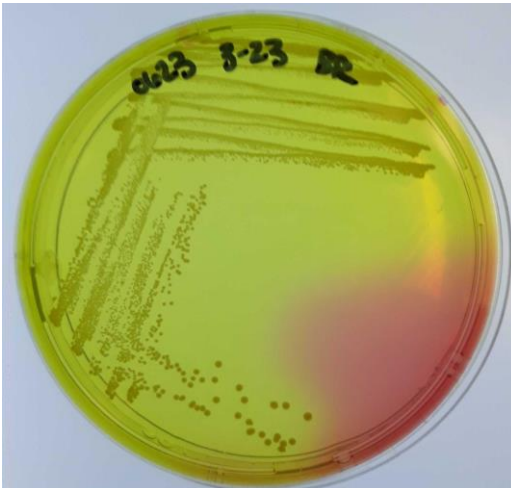


Figure 1. Of the 71 *S. aureus* strains taken from female participants, 6 of them produced TSST-1. Of the 65 *S. aureus* strains taken from male participants, 9 of them produced TSST-1. 5.4% more men carried TSST-1 than women.



Characterizing *S. aureus*

S. aureus characterization requires ALL of the following results:



Mannitol fermentation on MSA



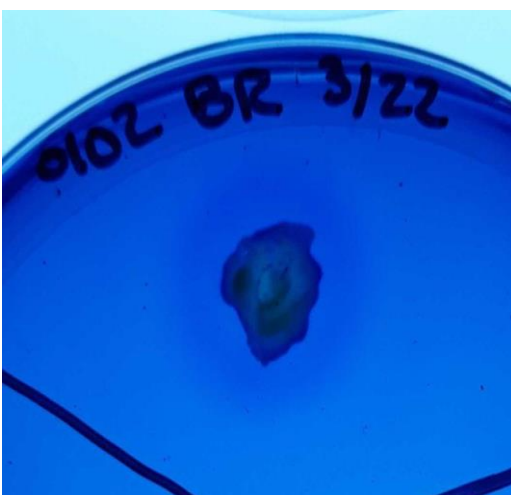
Beta hemolysis on CNA



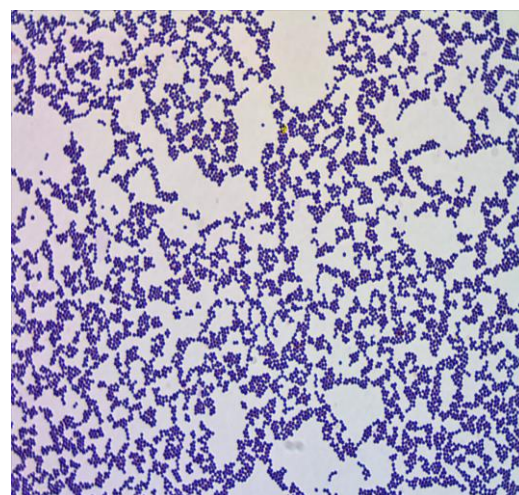
Positive catalase



Positive coagulase



Positive DNase



Gram-positive cocci in clusters

References & Acknowledgements

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Special thanks to Dr. Patrick Schlievert (University of Iowa) for helpful conversations. This research was partially funded by several CSP Faculty Development Grants. This work has IRB approval from CSP (studies 2016_42 & 2018_37).