



## Toxic shock syndrome: 20 years of experience from a tertiary paediatric burns centre

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### Background

Toxic Shock Syndrome (TSS) was first reported in 1978 after seven children developed a life threatening illness associated with Staphylococcal infection.

While TSS is a rare condition (incidence 2.5-14/100 paediatric burns) it can rapidly become fatal in the paediatric population. Children under 4 years of age, with skin loss are particularly at risk as they haven't developed antibodies to the toxins produced by the bacteria.

Children with relatively low total body surface area (TBSA) are also at higher risk due to the fact that they have less need for treatments such as surgical debridement which lowers bacterial load, and infusion of blood products that convey a passive immunity.

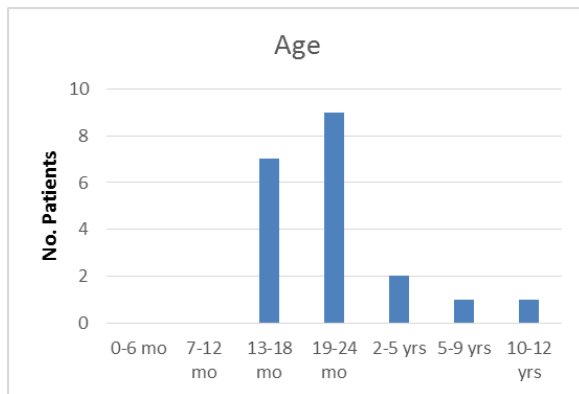
The superantigen, toxic shock syndrome toxin-1 (TSST-1) hyperstimulates the immune system producing a cytokines cascade ultimately leading to septic shock.

TSS is characterised by a cluster of signs and symptoms including; shock, pyrexia, an erythematous rash, gastrointestinal disturbance and central nervous system signs including lethargy or irritability.

### Review

The Burns unit at the Women's and Children's Hospital in Adelaide is a paediatric inpatient and outpatient service and the tertiary referral centre for paediatric burns for the whole of South Australia, most of the Northern Territory and western parts of New South Wales and Victoria.

In this study, we reviewed all patients with TSS managed by our unit between 1998 and 2018, examining the circumstances around the burn and their management pre and post diagnosis of TSS.



### Results

In the 20 year time period examined, there were 20 patients diagnosed with TSS at our institution. 15 patients were male and only 5 were female.

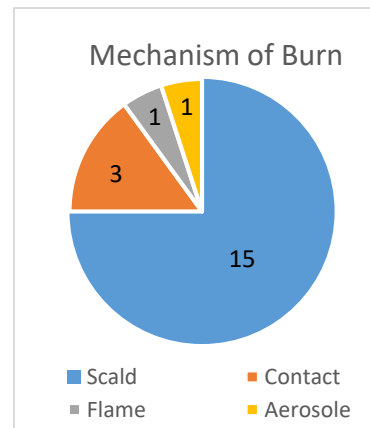
80% of our TSS patients were aged between 12 months and 2 years of age and as is typical for that age demographic and for TSS, scald burns as a mechanism accounted for 75% of patients.

Our patient cohort mirrored that of the relevant literature with 75% of patients having a TBSA of 6% or less. 20% of TSS patients had a TBSA of 4-6% and 55% of patients having a TBSA of 1-2%.

On analysis of signs and symptoms off TSS at diagnosis; 100% of patients had a fever of >39 degrees and 50% of patients experienced vomiting. Only 5% of patients were clinically in shock.

When examining the results of patients requiring Paediatric Intensive Care Unit (PICU) admissions for TSS, it was important to note that a change to the TSS protocol occurred at the midpoint of our study period. In the early 2000s the TSS protocol algorithm was streamlined from 3 possible pathways to 2 in attempts to simplify diagnosis and decrease time to the commencement of antibiotics if necessary.

Under the old protocol 7 patients were admitted to PICU, while under the revised protocol only 2 patients required PICU admissions.

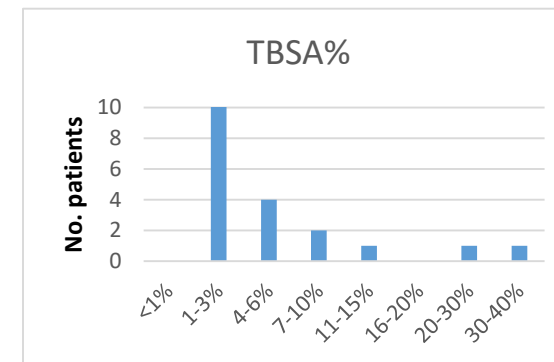


### Discussion

The review of TSS patients at our institution over a 20 year time period demonstrated a population of patients that were epidemiologically very similar to other published cohorts in the available scientific literature. Age, Mechanism of burn and TBSA% and presenting signs/symptoms were all in keeping with the typical presentation of TSS in paediatric burns patients.

Of interest was the findings that our institution has had one third the number of admissions to PICU since streamlining our TSS protocol diagnostic and treatment algorithm. While the study periods for the use of both protocols are not equal, once this is adjusted for there is still a demonstrable reduction in PICU admissions under the new protocol. Perhaps suggesting the new protocol allows for expedited recognition and treatment of TSS.

Another result that we feel highlights an area of future research is the finding that 75% of TSS patients had their burn first treated at a peripheral hospital, not at a tertiary burns centre. Further research into this finding may present an area for improved service provision and risk reduction.



### References

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