

# Toxic Shock Syndrome Toxin Positive MSSA in Glasgow

Clare Murphy  
ID/MM ST4

A decorative graphic consisting of several horizontal lines of varying lengths and colors (teal, white, and light blue) extending from the right side of the slide towards the center.

# Plan for Talk

- MSSA TSST
- Aims of Project
- Methods of Data Identification and Collection
- Results
- Conclusion and possible further applications

# Toxic Shock Syndrome Toxin

- Staphylococcus Aureus Exotoxin
  - Primarily Toxic Shock Syndrome Toxin -1
- Superantigens
  - Cause release of cytokines via T cell activation
  - Leads to clinical presentation of Toxic Shock
- Antibodies
  - 80% 12 year olds have antibodies to TSST

# Toxic Shock Syndrome

- **Acute** and life threatening
- Severe sepsis
  - Fever / hypotension
- Multi-organ failure
  - Reduced GCS
  - Liver impairment / AKI / raised CK / thrombocytopaenia
  - Myalgia / D and V
- Widespread erythematous rash
- Desquamation

# Aims

- Do patients with TSST MSSA show clinical signs of toxic shock syndrome
- SMRSARL – Glasgow Royal Infirmary
  - All sterile site samples – typing and toxin testing
- Current situation
  - 10% of SAB are TSST-1 positive
  - Clinicians are not informed of TSST presence
    - Clinical significance of this result is uncertain

# Method

- Identified TSST producing MSSA
  - SMRSARL
- Jan 2013 – July 2014
- 64 cases in GRI with 6 duplicates
  - 58 patients
  - Access to 39 patients notes
- Case Note Analysis
  - Demographics
  - Details of Admission – specialty / critical care /duration
  - Risk Factors
  - Source and Site of Infection
  - SIRS/CRP/WCC
  - Management
  - Outcomes

# Results - Demographics

- 39 case notes reviewed (all TSST positive)
- 23 (59%) male / 16 (41%) female

- Age

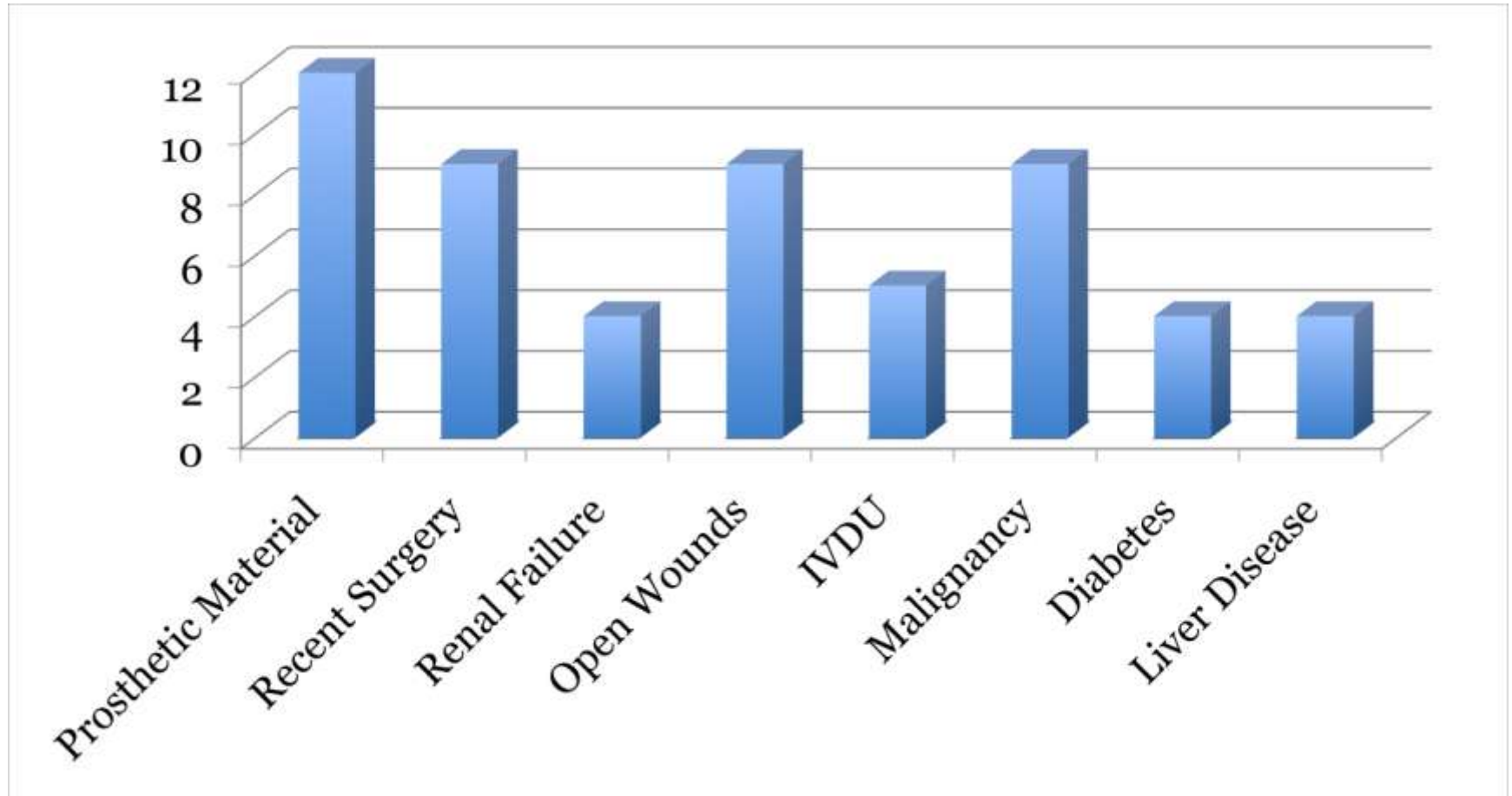
Age Range	Numbers of Patients	Percentage
18-30	2	5
31-40	4	10
41-50	5	13
51-60	4	10
61-70	6	15
71-80	13	33
81-90	3	8
91-100	2	5

# Results

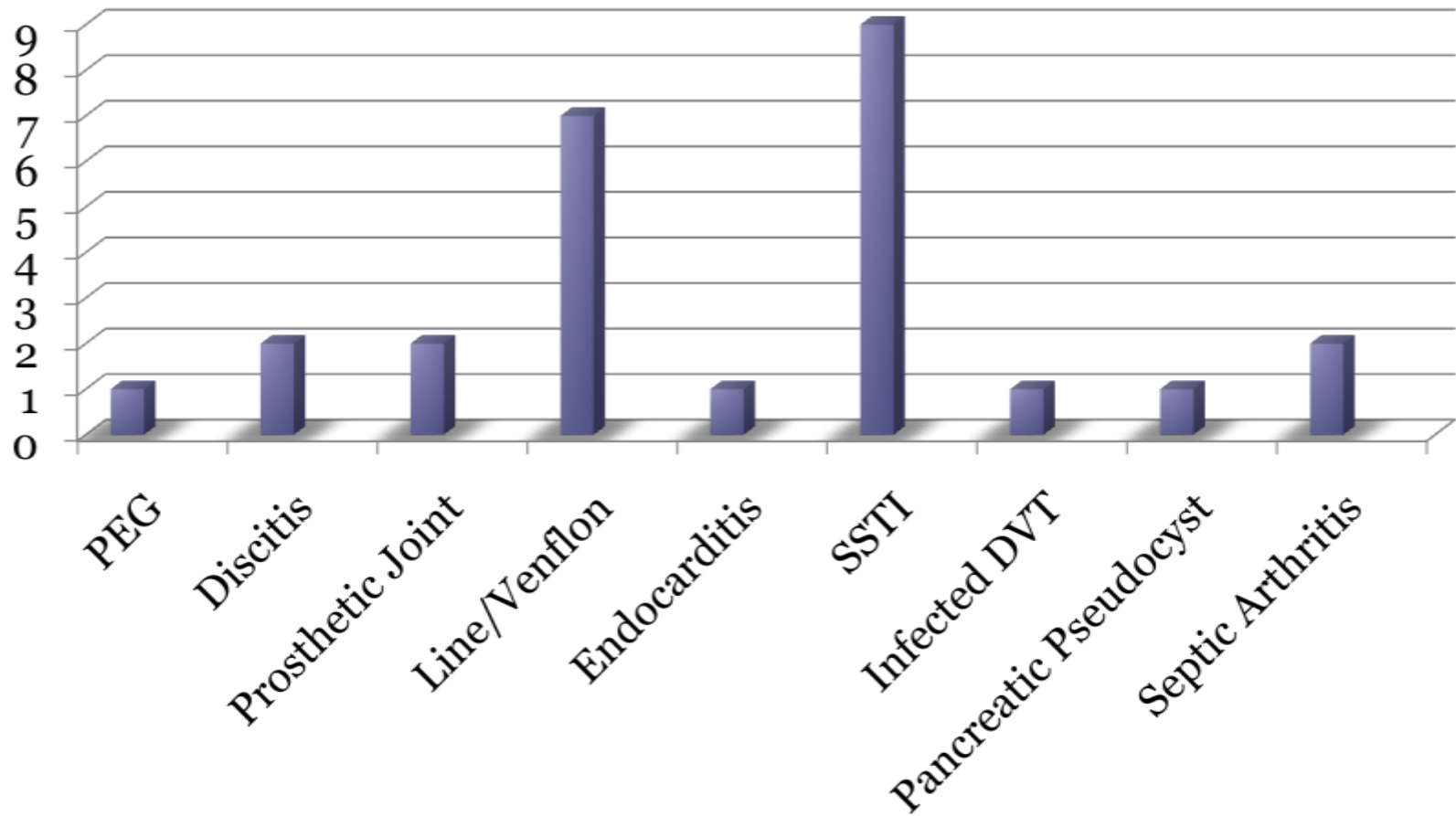
- Managing Specialty
  - Medicine 22
  - Surgery 10
  - Orthopaedics 3
  - Vascular Surgery 2
  - ITU 1
- Community – 28 cases
- Hospital – 11 (28%)



# Risk Factors



# Site of Infection



# Severity of Illness

- Clinical details / SIRS / Sepsis
  - Poorly documented
- CRP ranged from 23-476
  - Average 175
  - Average in critical care - 207
- Critical Care
  - ITU – 2
  - HDU – 2
  - CCU – 2
  - 15% required higher level care

# Outcomes

- Duration of Admission
  - Range from 1 day to 140 days
  - Average stay – 31 days
- Survival
  - 26 survived to discharge
  - 13 died (2 after recurrence of infection)
  - 33.3% mortality

# Conclusion

- Significant Morbidity and Mortality
  - 33.3% mortality
  - Lengthy inpatient stays
- Inconclusive
  - Difficult to ascertain some details due to retrospective case note analysis design
  - Small numbers in study
- Opens possibilities for future work

# Future

- Possibility of prospective data collection
  - Opportunity to include more information about illness severity
  - Using practices already in place for SAB
  - Comparison of TSST positive and negative cases
- Survey of clinician knowledge
- Clinician education and additional reminders on 'Sepsis 6' posters

# With thanks...

- Dr Ash Deshpande
- Dr Nitish Khanna
- Mrs Elizabeth Dickson

# References

- <http://www.uptodate.com/contents/staphylococcal-toxic-shock-syndrome>
- Parsonnet J, Hansmann MA, Delaney ML, et al. Prevalence of toxic shock syndrome toxin 1-producing *Staphylococcus aureus* and the presence of antibodies to this superantigen in menstruating women. *J Clin Microbiol* 2005; 43:4628.
- Spaulding AR, et al. Staphylococcal and Streptococcal Superantigen Exotoxins. *Clin Micro Rev* 2013 26(3); pp 422-447.
- Li, Z, et al. Fatal *S.aureus* Haemorrhagic Pneumonia : Genetic Analysis of a Unique Clinical Isolate Producing both PVL and TSST-1. *PLoS One* 2011 6(11) e27246.
- Aamot, HG, Blomfeldt A and Eskesen, AN. Genotyping of 353 *Staphylococcus aureus* Bloodstream Isolates Collected between 2004 and 2009 at a Norwegian University Hospital and Potential Associations with Clinical Parameters. *J Clin Micro* 2012 50(9); pp3111-3114.
- Van Hal SJ, Jensen SO, Vaska VL, Espedido BA, Paterson D, Gosbell I. Predictors of Mortality in *Staphylococcus aureus* Bacteremia. *Clin Microbiol Rev.* 2012 Apr; 25(2): 362–386.