



Positive blood cultures in a burn cohort: epidemiology and outcomes

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Introduction

Effects of bacteraemia and sepsis on morbidity and mortality following burn injury remain significant. Blood culture is essential for diagnosis of blood stream infection, identification of causative pathogens, and susceptibility testing to guide antibiotic therapy.

Aim: Examine the incidence of positive blood cultures (BCs) and effects on length of stay (LOS) in patients ≥16 years old admitted to Australian and New Zealand Burn Centres between July 2016 and December 2018

Methods

Patients ≥ 16 years who sustained a burn injury and were admitted to a burn unit between July 1 2016 and December 31 2018 were identified from the Burns Registry of Australia and New Zealand (BRANZ).

Patients were initially cohorted according to whether they did or did not have BCs taken during their admission. Patients who had BCs taken, were further grouped according to whether the results of the BC were positive or negative.

Participants with missing data, and invalid data were excluded. One hospital was excluded from the analysis, as their data was invalid. **Overall data completeness was 84%. 5,075 patients from 11 sites remained for analyses.**

Results

Patient characteristics according to BCs taken status (n=5075)

Characteristics	No BCs Taken 4316 cases (74.6%)	BCs taken 774 cases(25.4%)	p=
Age (years), mean (SD)	41.8 (18.3)	47.3 (18.4)	<0.001
Gender (male), n (%)	3078 (69.5)	586 (74.9)	1.000
% Deep burn, median (IQR)	0.0 (0.2, 1.0)	9.3 (5.4, 35.0)	<0.001
% TBSA, median (IQR)	2.0 (1.0, 5.0)	4.0 (0.3, 13.3)	<0.001
Inhalation Injury, n (%)	137 (3.1)	131 (16.8)	<0.001
ICU admission, n (%)	3343(75.5)	658 (84.1)	<0.001
Surgery: n (%)	230 (5.2)	311 (39.8)	<0.001
LOS days: median (IQR)	3.8 (1.6, 10.0)	18.6 (10.5, 38.7)	<0.001
Death: n (%)	26 (0.5)	26 (3.3)	<0.001

Patient characteristics according to BC positive status (n=774)

Characteristics	Positive BCs 91 cases (11.9%)	Negative BCs 683 cases (88.1%)	p=
Age (years), mean (SD)	43.6 (17.3)	46.3 (18.8)	<0.001
Gender (male), n (%)	62 (75.7%)	517(68.1%)	0.113
% Deep burn, median (IQR)	10.5 (0.0, 39.0)	0.0 (0.0, 5.0)	<0.001
% TBSA, median (IQR)	35.0 (16.0, 55.0)	8.0 (3.0,17.0)	<0.001
Inhalation Injury, n (%)	34 (37.4%)	95 (13.9%)	<0.001
ICU admission, n (%)	74 (81.3%)	232 (34.0%)	<0.001
Surgery: n (%)	85 (93.4%)	569 (83.3%)	0.012
LOS days: median (IQR)	54.6 (30.0, 80.7)	14.9 (7.0, 28.2)	<0.001
Death: n (%)	7 (7.7%)	19 (2.8%)	<0.001

Micro-organisms grown (n=91)

- 44.1% Gram positive organisms
- 12.1% Multi-resistant organisms
- 15.4% more resistant organisms eg. ESCAPPM



Positive BC incidence varied across participating units but significance not tested due to low numbers. Understanding of Burn Unit BC & bacteremia clinical practices would also improve understanding of these results.

Conclusions

Patients with positive BCs were older, male, & had more severe injuries than those whose BC results were negative. LOS was longer, & other in-hospital outcomes were poorer for patients with positive BCs. 27.5% of positive BCs organisms has some degree of resistance.

This was an exploratory analysis of the BRANZ QI. More data in the future will allow a more in-depth analysis of the effects of bacteremia in the Australian and New Zealand burn population. This preliminary analysis described the positive BC incidence and effects on LOS. It highlighted data validity issues, that when addressed will improve data completeness in the future, and also identified QI improvements to improve the quality of data regarding BC management & care for robustness of future studies