

The identification and development of a prognostic score to improve outcomes for First Nations Australians with Group A Streptococcus bacteraemia

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Background:

Group A Streptococcus (GAS) bacteraemia is linked to high case-fatality rates and disproportionately affects Aboriginal and Torres Strait Islander Australians (First Nations Australians). Recognition of risk factors that predict sequelae and identification of high-risk patients can prognosticate and promote early retrieval to higher-level care.

Objectives:

To determine factors predicting adverse outcomes in GAS bacteraemia patients and develop a prediction score to better risk-stratify clinical decision-making.

Methodology:

We reviewed 286 consecutive GAS bacteraemia patients from January 1, 2014, to December 31, 2020. Among them, 169 (59.1%) were First Nations Australians. Severe comorbidity was more common in First Nations Australians (50.3%) compared to non-First Nations Australians (35.0%, $p=0.01$). We assessed the relationship between demographic, clinical, and laboratory indices at presentation and adverse outcomes (death or ICU admission within 30 days). Multivariable analysis identified independent predictors of adverse outcomes.

Results:

Adverse outcomes occurred in 18% of patients. Independent predictors included systolic blood pressure (SBP) <100 mmHg, serum albumin <30 mmol/L, serum lactate >4 mmol/L, and lymphocyte count <0.5 x 10⁹/L. The BALL prediction score, incorporating these variables, showed a rising proportion of adverse outcomes with increasing scores: 10% (score 0) to 100% (score 4). The BALL score's area-under-the-curve was 0.77 (95% CI 0.69–0.85), surpassing NEWS2 (0.62, $p=0.02$) and APACHEII (0.53, $p=0.001$), and comparable to SOFA (0.79, $p=0.75$).

Discussion/Conclusion:

The BALL score, based on SBP, serum albumin, serum lactate, and lymphocyte count, effectively stratifies risk in GAS bacteraemia patients. This tool helps identify high-risk individuals, facilitating timely retrieval and escalation of care, particularly for First Nations Australians.

Statement on presentation pertaining to Indigenous Health Topic

The study took into regard First Nation Australian data sovereignty through active community engagement and co-design. Collaboration with First Nations Australian input shaped the research approach and tool development, ensuring the BALL score effectively addresses their specific health

needs and respects cultural perspectives, thereby promoting equitable and relevant healthcare solutions.