AUSTRALIAN COMMISSION ON SAFETY AND QUALITY IN HEALTH CARE

AURA Antimicrobial Use and Resistance in Australia

AGAR

Methicillin-resistant *Staphylococcus aureus* (MRSA) bacteraemia in Australia: 2013 – 2018

Report highlights

Background

As part of the Antimicrobial Use and Resistance in Australia (AURA) surveillance system, the Australian Group on Antimicrobial Resistance (AGAR) conducts targeted surveillance of certain pathogens that cause bloodstream infections in Australia. Together with the Australian Passive Antimicrobial Resistance Surveillance (APAS) system and the National Alert System for Critical Antimicrobial Resistances (CARAlert), these data provide a comprehensive picture of antimicrobial resistance (AMR) in Australia.

In September 2020, the Australian Commission on Safety and Quality in Health Care (the Commission) published the Methicillin-resistant *Staphylococcus aureus* (MRSA) bacteraemia in Australia report. This report provides analyses of data on MRSA bacteraemia collected by AGAR from 24 laboratories across Australia between 2013 and 2018 and highlights important national and state and territory trends.

This factsheet summarises some of the key findings from the report and their implications for therapeutic, quality improvement and infection prevention and control initiatives.

What is *Staphylococcus aureus*?

- *Staphylococcus aureus (S. aureus)* is a gram-positive bacterial pathogen that causes a wide range of infections. This includes infections that are self-limiting (e.g. boils, bullous impetigo); more serious infections (e.g. cellulitis, post-surgical wound infection); and, life-threatening infections (e.g. septicaemia, meningitis).
- Outbreaks of *S. aureus* infections can occur in hospitals from a common source, or through poor hand hygiene practices.
- Methicillin-resistant *Staphylococcus aureus* (MRSA) bacteraemia is a bloodstream infection caused by *S. aureus* bacteria that have developed resistance to some antibiotics, including methicillin.
- These bloodstream infections are more difficult to treat and are associated with high morbidity and mortality – some of these are preventable.
- As some MRSA bacteraemia infections are preventable, they are important for hospital surveillance and infection prevention initiatives.

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What trends were identified between 2013 and 2018?

- Between 2013 and 2018, the proportion of bacteraemias caused by MRSA remained relatively stable – between 17% and 18%. However, a number of important variations in MRSA bacteraemia, by place of onset, were identified.
- Community-associated (CA) MRSA emerged as the dominant cause of MRSA bacteraemia, while hospital-associated (HA) MRSA decreased (**Box 1**).
- In 2018, ST93-IV was the dominant CA-MRSA clone, causing 22% of all MRSA bacteraemias in Australia.
- Community-onset (CO) MRSA bacteraemia increased, while hospital-onset (HO) MRSA bacteraemia decreased (**Box 2**).
- Reductions in HA- and HO-MRSA are likely attributable to efforts in hospitals to control *S. aureus* bacteraemia. These include improvements in the management of invasive devices, national reporting of *S. aureus* bacteraemia and the National Hand Hygiene Initiative.
- A national benchmark is specified in the National Healthcare Agreement for public hospitals, that no more than 2.0 cases of *S. aureus* bacteraemia occur for every 10,000 days of patient care*.

Box 1: Definition of community-associated and hospital-associated MRSA

Community-associated (CA) MRSA refers to clones that commenced in and are found predominantly in the community.

Hospital-associated (HA) MRSA refers to clones documented to have commenced in and been spread significantly in healthcare settings.

Box 2: Definition of community-onset and hospital-onset bacteraemia

Community-onset bacteraemia refers to bacteraemia identified from blood cultures collected prior to, or within, 48 hours of hospital admission.

Hospital-onset bacteraemia refers to bacteraemia identified from blood cultures collected after 48 hours of hospital admission.

What are the therapeutic implications of these changes?

- As CA-MRSA increases in the community, empiric treatment of skin and soft tissue infections with first-line agents becomes less reliable (e.g. flucloxacillin has become an unreliable choice).
- Microbiological sampling and confirmatory antimicrobial susceptibility testing for *S. aureus* has become increasingly important. This can help to identify whether MRSA is present and if so, what the best therapeutic choices might be.

What else can be done to respond to changing trends in MRSA bacteraemia?

- There are specific control and prevention measures that can be used in hospital and aged-care settings to help control the spread of dominant and emerging MRSA clones (e.g. ST93-IV and ST22-IV).
- These measures may include:
  - Greater surveillance effort
  - Infection prevention and control practices, including decolonisation
  - Antimicrobial stewardship initiatives
  - Antiseptic use practices.

Where can I find more information?

To access Commission resources on the prevention of *S. aureus* bacteraemia, please visit **https://www.safetyandquality.gov.au/our-work/infection-prevention-and-control/staphylococcus-aureus-bacteraemia-sab-prevention-resources**.

For more information on the AURA program, including data collected by AGAR please visit **safetyandquality.gov.au/aura**.

* Commencing 1 July 2020, the Australian Health Ministers' Advisory Council endorsed a revised national benchmark for *S.aureus* bacteraemia for public hospitals, of 1.0 per 10,000 patient bed days.