Reviewer's report

**Title:** Epidemic spread of ST1-MRSA-IVa in a neonatal intensive care unit, Italy

**Version:** 1  **Date:** 21 March 2012

**Reviewer:** Linda K. McDougal

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Title: Epidemic Spread of ST1-MRSA-IVa in a Neonatal Intensive Care Unit, Italy
(Need to spell out Sequence Type, Methicillin resistant Staphylococcus aureus. I suggest leaving IVa out of the title)

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Purpose of the study:
Identify MRSA isolates from a NICU outbreak (MLST)
Characterize isolates by genetic traits and related ness (MLVA)
Review the characteristics of the neonatal cases and their outcomes
Investigate the route of entry and transmission of MRSA in the NICU.

Background: Reference 4 doesn’t state the frequency of USA300 isolates in Europe.

Are the methods appropriate and well described?

Minor Essential Revisions:
The authors should have a clear separation of the methods and the results. I’m not sure if ‘Description of the outbreak’ falls under methods or results.

Under MRSA surveillance, an infant was considered a case of infection if the infant had clinical signs and symptoms requiring antimicrobial therapy. Was there an isolate obtained from these ‘cases’?

Laboratory methods: State the quality control strains used for disk susceptibility testing?

On page 6 of outbreak description, MRSA was isolated from an axillary skin swab. However, in the discussion, it’s stated that the nares was the only surveillance sampling site.

Fig.3. What is ETT culture?
The index case (Apr.5) does not appear to be the same as case 1 in Fig. 3?

From the data in Fig. 2 all MRSA isolated during the outbreak dates were not identified as ST1. Some of the isolates were subsequently identified as ST22. How was this data handled?
Infection control measures: Were new and improved infection control measures applied to infants colonized with ST22 MRSA isolates? Was hand hygiene observed regularly to ensure that staff were in compliance?

Are the data sound?

Data appear to be sound.

Are the discussion and conclusions well balanced and adequately supported by the data?

The authors could include in the discussion the ability of MLVA to discriminate among endemic MRSA and the outbreak strain.

Major Compulsory Revisions:

One of the purposes of the study was to review the neonatal cases and their outcomes. Table 1 lists ‘outcome’ as ‘discharged’ or ‘dead’. There was no mention of outcome due to infections caused by ST1 MRSA in the discussion.

The NICU in the study had been experiencing an on-going endemic problem with ST22 MRSA for over 2 years, prompting the implementation of ‘strict infection control measures’. Meetings of laboratory personnel during the ‘outbreak’ of ST1 MRSA identified the likely cause of transmission and the major driver of the dissemination of the ST1 MRSA among infants as the hands of the health care workers. No additional factors were identified. Screening of healthcare workers was not in place when the index case was admitted; nor was it implemented during the 3 months of the outbreak. There was no data to indicate that subsequent cross-transmission occurred via the hands of the HCW as was suggested in the discussion.

Are limitations of the work clearly stated?

Although there was much discussion about the pros and cons of screening HCWs in the discussion, I feel that the lack of screening of HCW was a large limitation of the study.

During an outbreak, infants should be screened for MRSA on admission, as well as weekly, until evidence suggests a halt in transmission.

Level of interest:

An article of importance in its field.

Is the writing acceptable?

Manuscript will require extensive editing and rephrasing before publication (e.g. Materials and methods should be written in past tense). Not suitable for publication unless extensively edited.

Statistical review

No, the manuscript does not need to be seen by a statistician.

Declaration of competing interests:

I declare that I have no competing interests.
Level of interest: An article of importance in its field

Quality of written English: Not suitable for publication unless extensively edited

Statistical review: No, the manuscript does not need to be seen by a statistician.

Declaration of competing interests:

'I declare that I have no competing interests.