

Improving patient management with Staphylococcus aureus bacteraemia – the evolution of a MSSA review group

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Introduction

Staphylococcus aureus bacteraemia is a serious infection associated with significant mortality and morbidity. With the introduction of Department of Health mandatory reporting of Metcillin sensitive Staphylococcus aureus (MSSA) bacteraemia in 2011, a MSSA review group was developed within a large teaching hospital to review all MSSA bacteraemia cases, both Hospital and Community onset (blood cultures taken post and pre 48 hours of admission) cases. Over time, the function of this group has evolved from simply identifying cases for the mandatory reporting to become a group focused on improving patient management and outcomes.

Approach

The MSSA review group meets weekly and comprises of a Consultant Microbiologist, Infection Prevention Nurse Specialist and Infection Prevention Nurse. The purpose of the group has evolved as we have identified areas requiring further work in order to improve patient outcomes.

Current objectives of the MSSA review group:

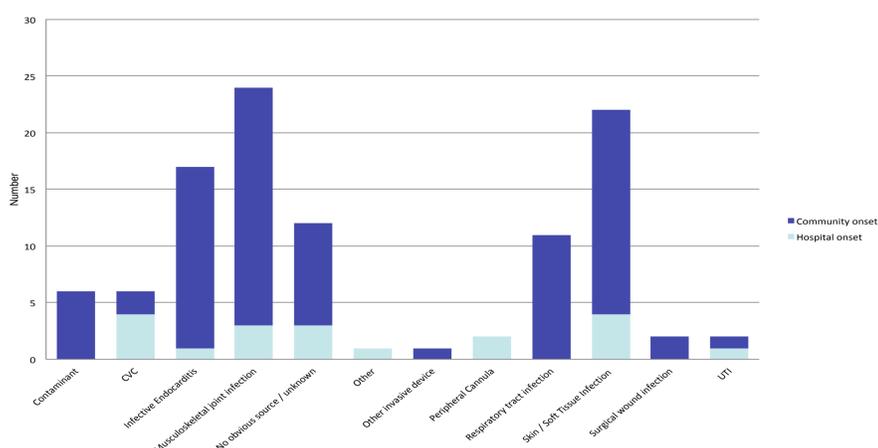
- Ensure reporting is in line with mandatory requirements
- Weekly review of all patients with MSSA positive blood cultures – to ensure optimal management as per Trust guidelines¹
- Request and review Root Cause Analysis (RCA's) for all Hospital onset and identified Community cases that have had significant hospital healthcare intervention. These RCA's are discussed at the Trust 'Healthcare associated Infections' meeting chaired by the Medical Director
- Continuous enhanced local surveillance of cases which includes quality indicators. Data is collected on:
 - probable source of the bacteraemia,
 - patient risk factors
 - antibiotic therapy
 - repeat blood cultures
 - echocardiography (has an echocardiogram been undertaken)
 - documentation of the bacteraemia in the discharge letter
 - outcome data at 4 and 8 weeks
- Analyse trends and identify areas of concern
- Identify areas of development or learning requirements for the organisation
- Facilitate wider learning and interventions where necessary.

Discussion of data

The probable source of MSSA bacteraemia's cover a wide range of infections, most common are: skin and soft tissue, musculoskeletal and infective endocarditis.

There was a significant increase in respiratory tract related bacteraemia in 2017/18 (11 from 4 in 16/17). This is probably related to the heavy influenza season, as a high proportion of patients reported flu symptoms in the weeks prior to being admitted with pneumonia.

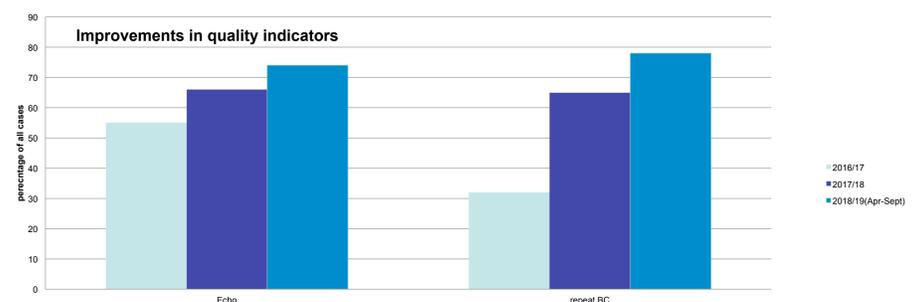
2017/18 MSSA bacteraemia probable source - 112 cases



Quality indicators Through our surveillance we identified a number of areas for improvement against our guidelines in the ongoing management of patients including:

- antibiotic treatment
- taking of repeat blood cultures
- investigation for deep source, particularly echocardiography.

We introduced a S.aureus bacteraemia care bundle² based on national guidelines for investigation and treatment as an improvement measure in November 2017. The clinician is guided through the care bundle when a positive blood culture is reported.



Intravenous drug users (IVDU's) are not surprisingly a high risk group for MSSA bacteraemia. From our 2017/18 surveillance:

22/112 (20%) of cases were identified with IVDU as a risk factor.

Of these 22 cases the probable sources:

- 7 infective endocarditis
- 8 musculoskeletal (discitis, septic arthritis, paraspinal abscess)
- 7 skin and soft tissue (groin abscess, infected thrombosis)

6 of the IVDU patients received sub therapeutic antibiotics due to compliance issues

We have initiated multi agency working to try and address some of the challenges with this patient group looking at both prevention and improving treatment.

All cause 30 day case fatality. As our date of death is recorded our data can be benchmarked against the national PHE statistics^{3,4}. Whilst this must be interpreted with caution, we have seen a reduction in all cause mortality of cases within the Trust

A reduction in MSSA bacteraemia all cause case fatality

	Trust 16/17	PHE 16/17	Trust 17/18	PHE 17/18
Hospital onset	38.7% (12/31)	n/a	24.0% (6/25)	23.2%
Community Onset	15.4% (12/78)	n/a	16.1% (14/87)	19.1%
Overall	22.0% (24/109)	19.7%	17.9% (20/112)	20.2%

Summary

The MSSA review group has been able to demonstrate significant improvements in adherence to guidelines and thus optimising patient care and outcomes.

Work streams going forward:

To continue to build on the work of the MSSA review group

Incorporate all Staph aureus bacteraemia

Further development of multi agency working in relation to IVDU patients – including patient information, education and exploration of treatment options

Expansion of the group to incorporate a newly merged hospital site

References:

- 1) Staphylococcus aureus Bacteraemia Clinical Guidelines, Derby Hospitals NHS Foundation Trust, 2016.
- 2) Staphylococcus aureus Bacteraemia Care bundle, Derby hospitals NHS Foundation Trust, 2017.
- 3) Public Health England. 30-day all-cause fatality subsequent to MRSA, MSSA and Gram-negative bacteraemia and C. difficile infections, 2017/18. October 2018
- 4) Public Health England. Thirty-day all-cause fatality subsequent to MRSA, MSSA and E. coli bacteraemia and C. difficile infection, 2016/17. September 2017.