

# CHARACTERISTICS OF POSITIVE BLOOD CULTURES, ANTIBIOTIC THERAPY AND OUTCOMES IN PAEDIATRIC BONE MARROW TRANSPLANT RECIPIENTS – A RETROSPECTIVE OBSERVATIONAL STUDY

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## Background

Bone marrow transplantation (BMT) recipients are particularly susceptible to systemic infections. We aimed to characterize organisms leading to bacteraemia in this group and map this to clinical data. In a retrospective observational study we analyzed the data of all post BMT patients with a positive blood culture to reflect on our current choice of antibiotics and removal of central lines.

## Methods

Positive blood cultures were identified retrospectively from laboratory data between the period of February 2016 to March 2017 in a large paediatric BMT centre in London. Clinical data included time of positivity compared to transplantation date, type of transplant, neutropaenia, presence of a central venous catheter (CVC), community or hospital onset, type and length of antibiotic treatment clinical outcome and resistance patterns.

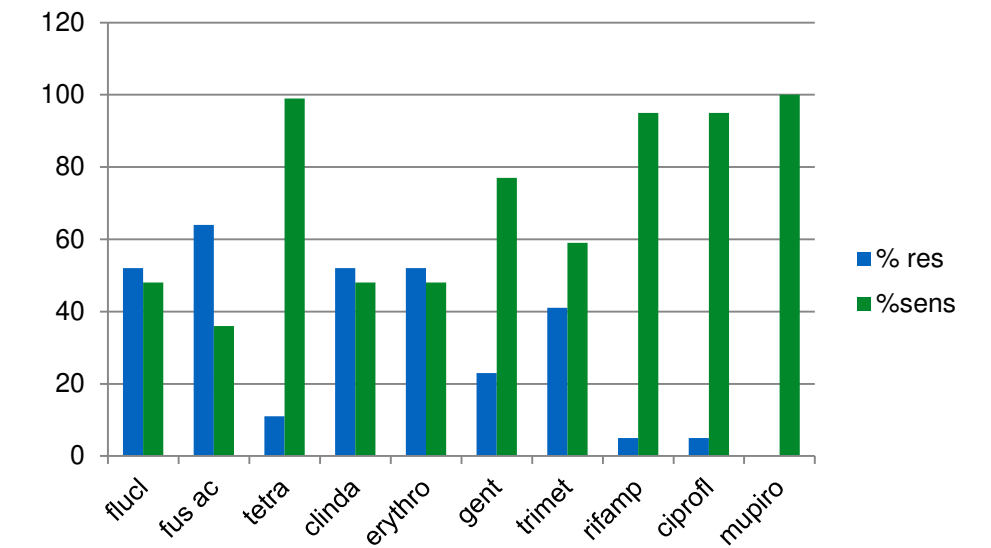
The organisms found in the 3 episodes without a CVC were a *Stenotrophomonas*, a *S. sanguinis*, and a CONS, the last one in a patient who was surprisingly neutropenic at 266 days post transplant.

Coagulase negative *Staphylococci* (CONS) were the most common pathogen in 28%, followed by *Klebsiella pneumoniae* (14%) and *Stenotrophomonas maltophilia* (10%)

18% of the tested organisms were resistant to our first line piperacillin/tazobactam., but only 4% to Ciprofloxacin, our neutropenic prophylactic agent. All tested organisms were sensitive to Gentamicin and Amikacin, both of which drugs we use as back-up. We had a 20% Vancomycin resistance rate (1 VRE), but all tested organisms were sensitive to Meropenem and Teicoplanin.

50% of CONS, 80% of non-CONS CVCs were removed within 7 days of bacteraemia. 95% of CVC tips were cultured but only 1 cultured the organism same as the blood (a *Klebsiella pneumoniae*).

The 30 day mortality rate was 14%.



CONS resistance

## Conclusions

Bacteraemias are common complications of BMT. Identifying the responsible organisms allows targeted therapy and surveillance of regimens. We need to monitor the percentage of resistance to antibiotics and review our guidelines. We had a high rate of CVC removal with a low rate of positive line tip culture. Further study is needed as to whether early removal of CVCs in all bacteraemic patients is necessary.

## Organisms

### Gram positive

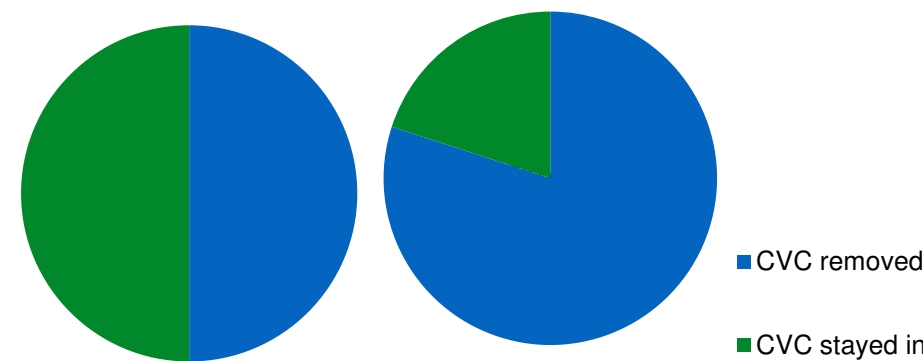
- 8 coagulase negative *Staphylococcus*
- 2 *Staphylococcus aureus*
- 1 beta haemolytic *Streptococcus group G*
- 1 *Streptococcus sanguinis*
- 1 *Streptococcus mitis*
- 1 Vancomycin resistant *Enterococcus*
- 1 *Enterococcus faecium*
- 1 *Micrococcus sp.*

### Gram negative

- 4 *Klebsiella pneumoniae*
- 2 *Klebsiella oxytoca*
- 2 *Enterobacter cloacae*
- 2 *Escherichia coli*
- 1 *Pseudomonas aeruginosa*
- 1 *Acinetobacter sp.*
- 3 *Stenotrophomonas maltophilia*
- 2 *Ochrobactrum anthropii*

### Yeast

- 2 *Candida glabrata*



CONS

Non-CONS

## Results

35 positive blood cultures from 28 clinical episodes were identified.

Not surprisingly, most of the patients, 68% presented in the first 90 days post transplantation. In the first three weeks every patient was neutropenic, and even in the first 3 months, 79% were neutropenic

An indwelling CVC was present in 89% of episodes, in other words, all patients until 150 days, and no patients over 150 days post transplant had a central line.

64% (18/28) were hospital onset episodes.

We thought having a haploidentical transplant will have a protective value against infections given the decreased need for immunosuppression, but exactly half of the episodes came from haplo transplant recipients.

## No of episodes

