Clinical profile and outcome of patients with *Burkholderia cepacia* bacteremia and contaminated ultrasound gel as source of infection

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**Background**

*Burkholderia cepacia* complex (Bcc) is a gram negative bacteria usually affecting those with cystic fibrosis causing pneumonia. It is usually considered as a nosocomial pathogen in those without underlying cystic fibrosis. We looked at the clinical profile and outcome of Bcc bacteremia in patients without cystic fibrosis, admitted to a tertiary care hospital in South India to understand the risk factors and preventive aspects.

**Methods**

Retrospective study of charts of patients with bacteremia due to Bcc admitted to this hospital were reviewed over the period 2012-17. Patient profile, underlying medical condition, devices used, source of infection, Pitt's bacteremic index, outcome and sensitivity profile were looked into.

**Results**

22 patients with Bcc bacteremia were identified during this period. Among these 22 patients, 17 patients were identified during 2017. Age of patients ranged from 16 months to 83 years, averaging 47 years. 89.5% were nosocomial; 77.3 % had indwelling vascular catheter, either CVC, dialysis catheter or permacath. When 30 days mortality was looked at, 17 patients survived and 5 patients expired. Those who expired had high Pitt's bacteremic score (scoring done either prior to or within 48 hours of positive culture), 4 patients had underlying pneumonia, of which 2 patient's respiratory sample grew Bcc, 3 also had underlying vascular catheters.

Sensitivity pattern of Bcc was noted as follows: trimethoprin sulfamethoxazole was uniformly sensitive (100%), ceftazidime was sensitive in 86.5%, minocycline in 73% of isolates. Meropenem was tested in 19 and was found sensitive in 15 isolates (79%), fluoroquinolone was tested only in 8 isolates and was sensitive in 7.

**Analysis of possible sources of infection**

- A increase in Bcc bacteremia and its association with indwelling vascular catheters in 2017 prompted to process audit.
- CLABSI bundle compliance audit revealed inadequacies in chlorhexidine (CHG) strength (0.5% instead 2% CHG) for skin antisepsis, failure to use full sterile draping, contaminated ultrasound gel, inadequate probe disinfection.
- Gaps in CLABSI maintenance bundle were- hand hygiene before CVC handling was only 85% and alcohol rub for hub disinfection were practised only in 75%
- Environmental surveillance such as water, high touch surfaces, knobs, infusion devices, computer key boards, ultrasound probe did not reveal Bcc growth

**Distribution of Bcc cases and risk factors**

<table>
<thead>
<tr>
<th>2/22 were community onset</th>
<th>20/22 (90.5%) were nosocomial</th>
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<tr>
<td>11 CVC</td>
<td>3 Dialysis catheter</td>
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<tr>
<td>3 had CVC + internal catheter</td>
<td>2 Permacath 1 Hickmann</td>
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<tr>
<td>4 had pneumonia</td>
<td>17/22 (77.3%) had vascular catheter</td>
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**Interventions**

- Video demonstration and hands on sessions on CVC insertion and maintenance were given as part of retraining.
- CVC insertion: Corrective measures were taken for identified gaps in asepsis. The team leader was made to check and intervene when asepsis is not maintained. Femoral catheters were discouraged.
- Contaminated ultrasound gel was replaced with sterile gel sachet.
- At 3 months follow-up there was no further incidence of Bcc bacteremia.

**Conclusions**

Bcc bacteremia is an important nosocomial pathogen, especially associated with intravascular catheters with 26% mortality in the study group. Cotrimoxazole was 100% sensitive. Good infection control practices, including early removal of unnecessary catheters are important to prevent its occurrence and transmission. Ultrasound gel can harbour Bcc and pose a potential threat for infection.

**References**

El Chakhtoura NG. A 17-Year Nationwide Study of Bcc bloodstream infections among patients in the United States Veterans Health Administration. CID 2017;65(8):1327–34