**Staphylococcus aureus** Bacteremia due to Central Venous Catheter Infection: A Clinical Comparison of Infections Caused by Methicillin-Resistant and Methicillin-Susceptible Strains.

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**Abstract**

**Background:** Bacteremia due to *Staphylococcus aureus* (S.aureus) has been associated with mortality rates of 15-60%. Central venous catheter (CVC) infection is a major cause of healthcare associated S.aureus bacteremia. We aimed to investigate differences in clinical features and mortality rates for patients who have MRSA bacteremia compared with methicillin-susceptible S.aureus (MSSA) bacteremia secondary to CVC infection.

**Methods:** We retrospectively reviewed the records of patients who were admitted to our hospital from August 2004 to March 2016 and were diagnosed with MRSA bacteremia due to CVC infection. MSSA bacteremia secondary to CVC infection was also included for comparison. We analyzed the characteristics, therapy, complications, and 60-day mortality rate of the MRSA pts and MSSA pts. Mann-Whitney U-test, chi-square test, and Fisher test were used for analysis.

**Results:**

- **Baseline Characteristics:**
  - Median age was significantly higher in MRSA pts: 69 years (IQR 60-72) compared with MSSA pts (55 years (IQR 48-65), P<0.01).
  - Male patients accounted for 60% of MRSA pts and 53% of MSSA pts, P=0.49.
  - The incidence of septic shock was higher in MRSA pts: 48% vs 11%, P<0.01.

- **Complications:**
  - MRSA pts showed a significantly higher incidence of MRSA bacteremia compared with MSSA pts.
  - MRSA pts had a significantly higher mortality rate of the MRSA pts vs the MSSA pts.

**Conclusion:**

1. We analyzed total 36 pts with S.aureus bacteremia due to CVC infection.
2. 17 MRSA pts (47%) and 19 MSSA pts (53%) were identified.
3. Median age was significantly higher in MRSA pts (69 years vs 55), P<0.01.
4. MRSA pts showed significantly higher incidence of MRSA bacteremia compared with MSSA pts.
5. MRSA pts showed significantly higher incidence of septic shock compared with MSSA pts. (48 % vs 11 %), P<0.01.
6. 60-day mortality rate was significantly higher in MRSA pts compared with MSSA pts (35 % vs 5.3 %), P<0.04.

**Introduction**

- Bacteremia due to *Staphylococcus aureus* (S.aureus) has been associated with mortality rates of 15-60%.
- Central venous catheter (CVC), chronic kidney disease, prolonged antibiotics use, solid tumor, and a history of hospitalization are known to be risk factors of S.aureus bacteremia.
- CVC infection is a major cause of healthcare-associated methicillin-resistant *S.aureus* (MRSA) bacteremia.
- Many reports have shown that the prognosis of MRSA bacteremia was worse compared with MSSA bacteremia.
- There have been few studies that evaluated the prognosis of MRSA bacteremia due to CVC infection compared with MSSA bacteremia due to CVC infection.

**Method**

- Retrospective cohort study at St Luke’s International Hospital (530 beds, acute care hospital in Tokyo, Japan).
- Patients (pts) with positive for MRSA or MSSA from peripheral blood cultures and also positive from semi-quantitative cultures of CVC tip taken on the same or near date from Aug 2004 to Mar 2016 were included.
- We compared the characteristics, therapy, complications, and 60-day mortality rate of the MRSA pts and MSSA pts. Mann-Whitney U-test, chi-square test, and Fisher test were used for analysis.

**Results:**

- MRSA pts: 6/17 (35%) vs MSSA pts: 1/19 (5.3%), P=0.04.
- Time lag from onset to CVC removal: MRSA pts <1 day vs MSSA pts >1 day, P=0.71.
- CVC infection was present at catheter (CVC) tip when taken on the same or near date from Aug 2004 to Mar 2016.
- The incidence of septic shock was higher in MRSA pts: 48% vs 11%, P<0.01.

**Conclusion:**

1. Pts with MRSA carrier and old age might have higher risk of MRSA.
2. 60-day mortality rate was significantly higher in MRSA pts compared with MSSA pts.
3. MRSA pts showed significantly higher 60-day mortality rate compared with MSSA pts in spite of appropriate therapy (35% vs 5.3%), P<0.04.