

A Retrospective Study On Carbapenem-Resistant Enterobacterales (CRE) Bacteremia in A Tertiary Hospital In Perak from year 2018 to 2023

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INTRODUCTION

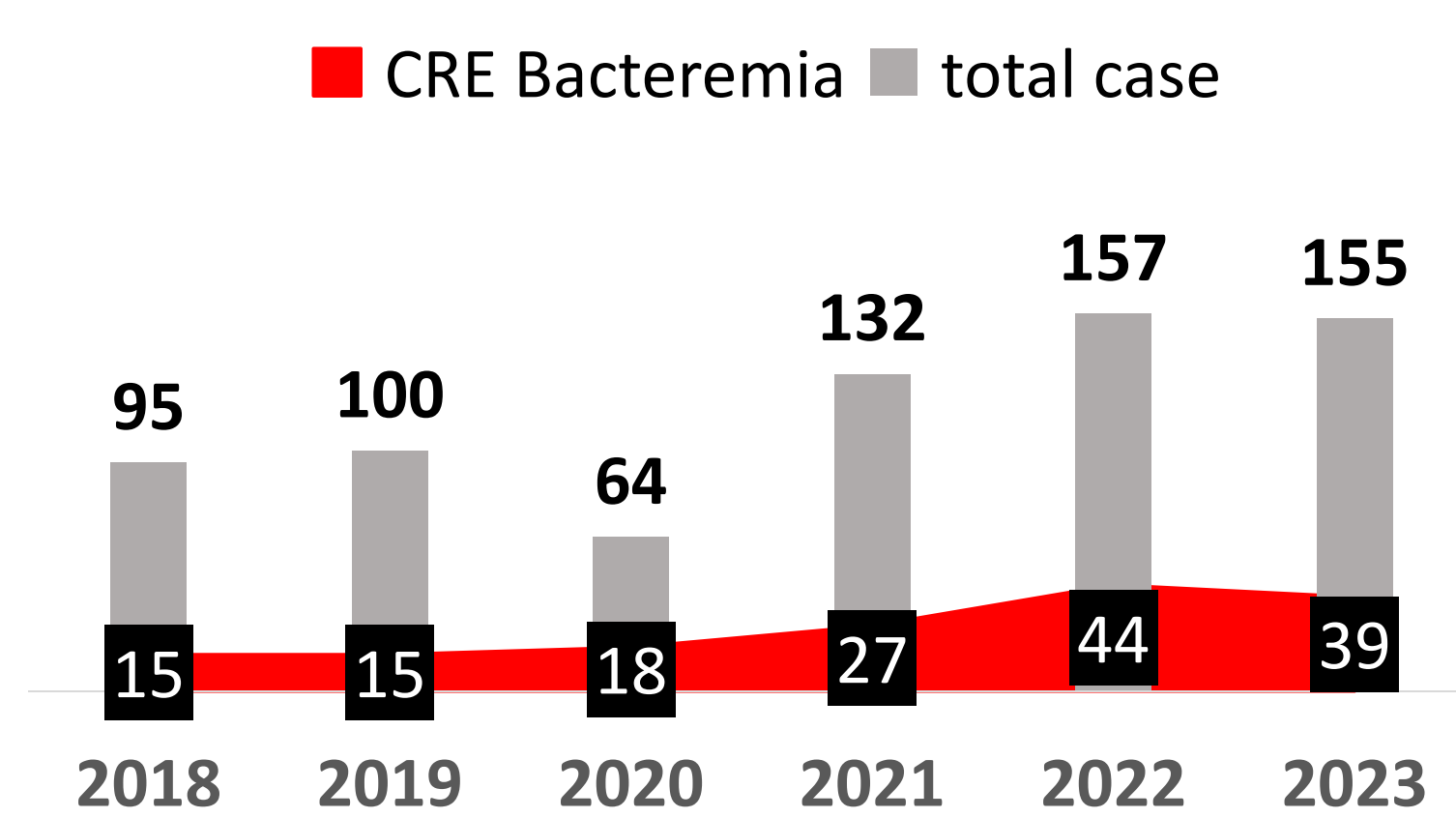
Carbapenem-Resistant Enterobacterales (CRE) are serious multidrug resistant gram-negative bacilli with increasing health threat. Bacteremia caused by CRE has limited treatment options and is associated with high mortality rate. Our study aimed to identify the contributing factors for CRE bacteremia, prevalence rate and 30 days mortality rate in a 1097 bedded tertiary hospital.

METHODOLOGY

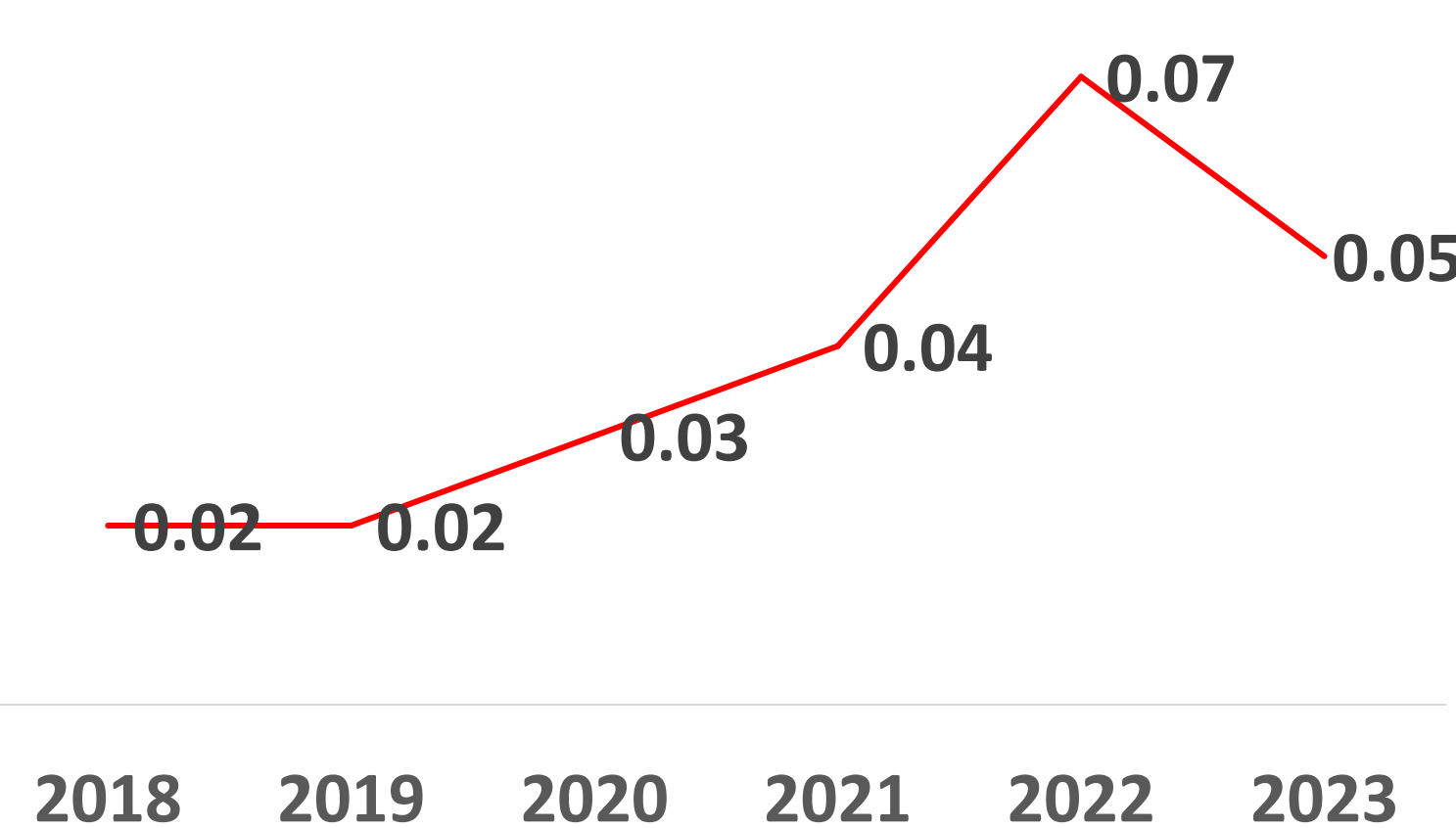
A retrospective descriptive analysis was conducted among patients admitted to Hospital Raja Permaisuri Bainun (HRPB) from January 2018 until December 2023. Patients with CRE bacteremia were identified from monthly Multidrug Resistant Organism (MDRO) surveillance line listing collected by Hospital Infection Control Unit. Patients' medical records were analysed to extract the contributing factors prior to development of CRE bacteremia, prevalence rate per 100 admissions and 30 days mortality rates. The cause of death was based on the documentation by the primary team in medical records.

RESULT

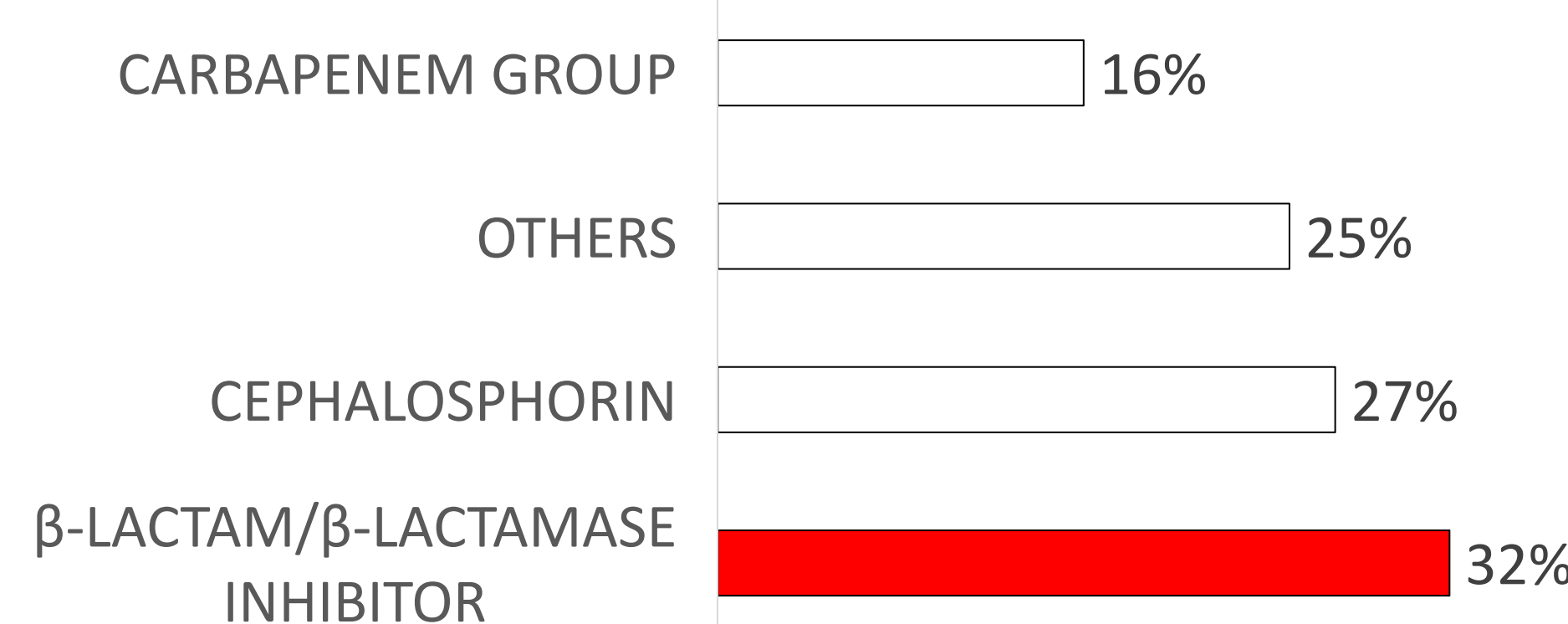
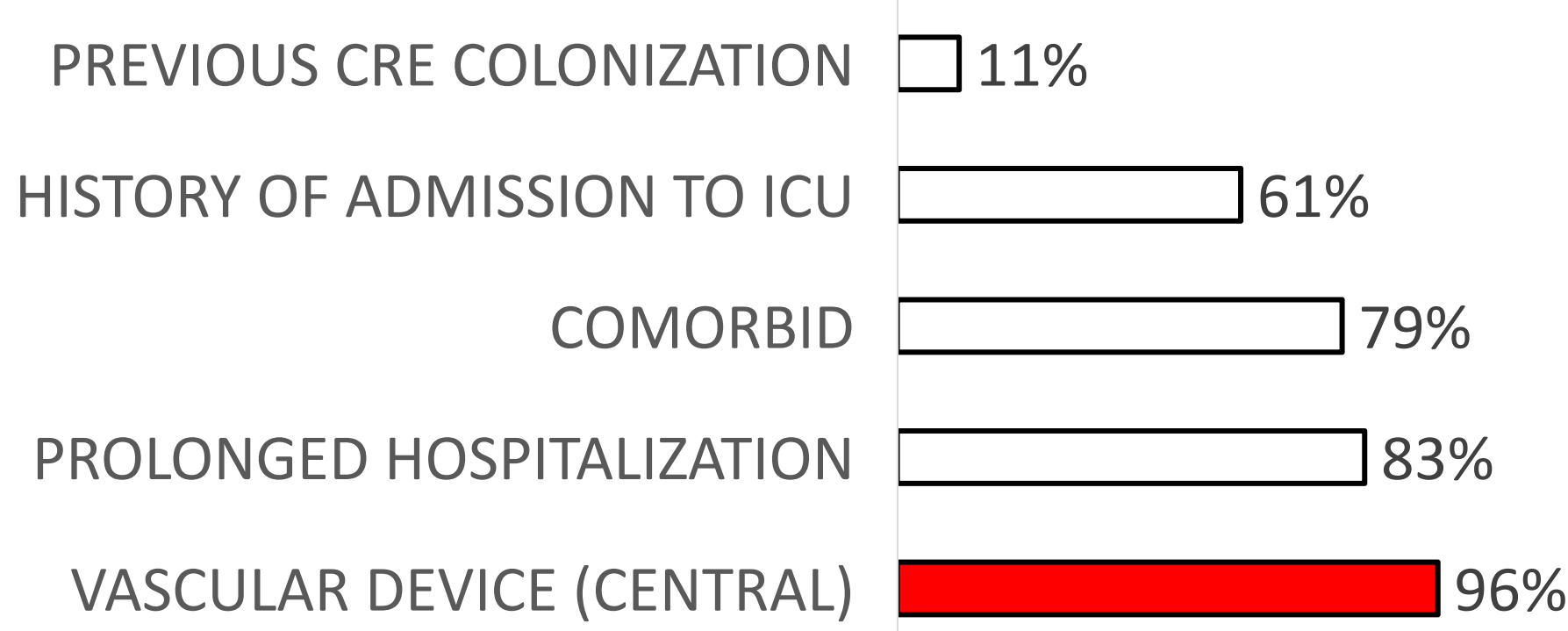
Total CRE vs CRE Bacteremia



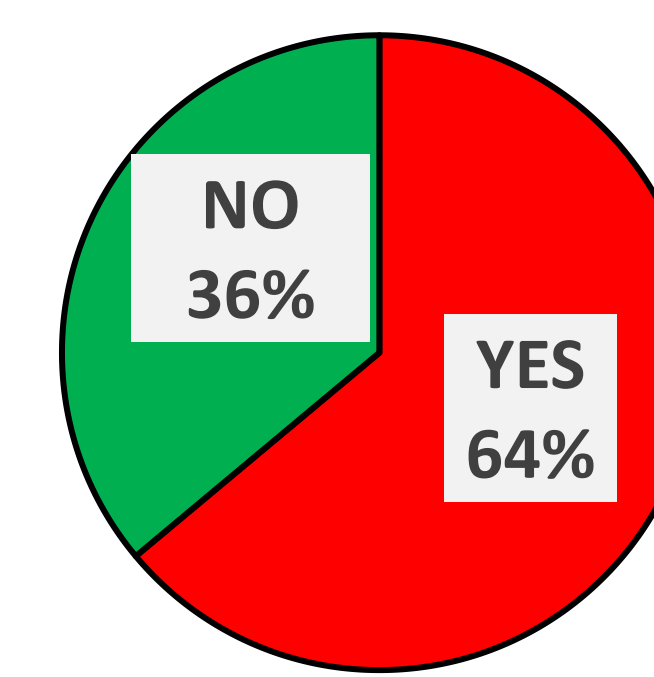
HA CRE Bacteremia Prevalence



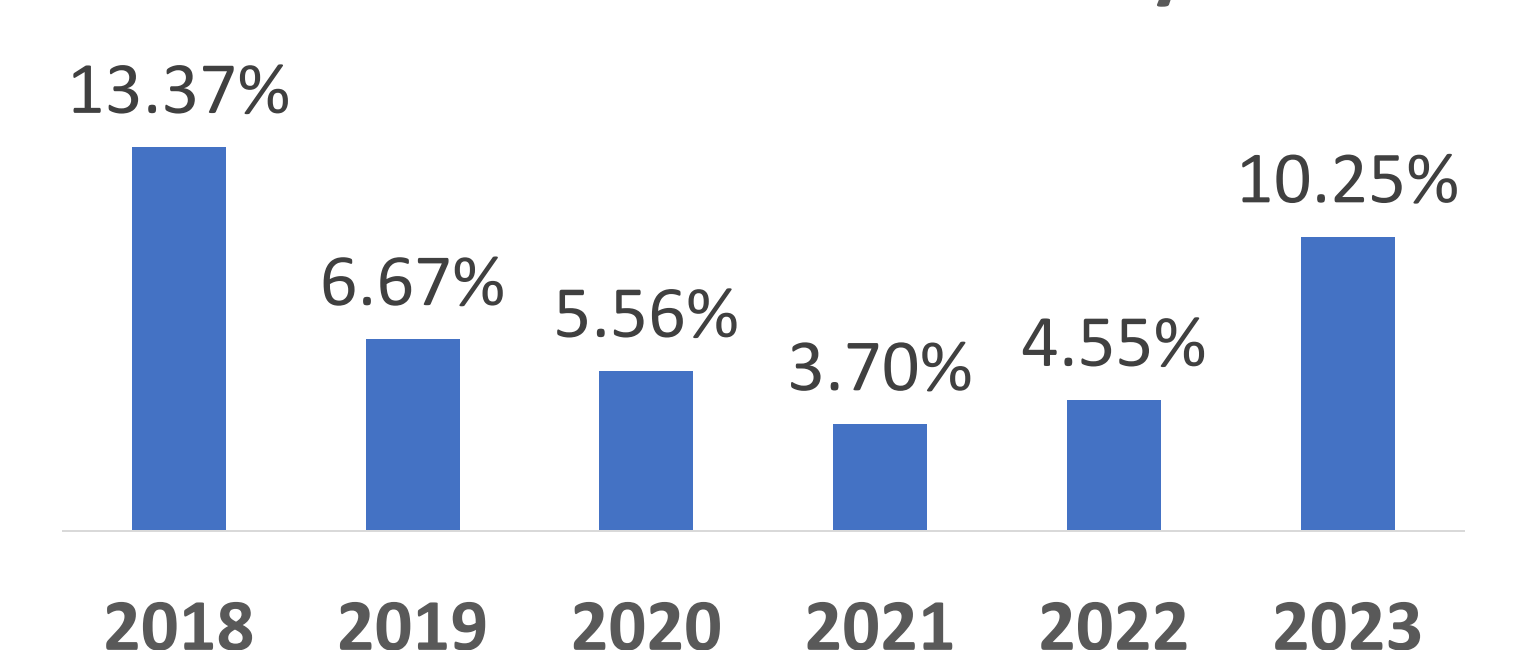
- A total of 703 CRE cases was identified from January 2018 until December 2023. Out of 703 CRE cases, 158 cases were identified as hospital associated CRE bacteremia with 85% identified as CRE *Klebsiella pneumoniae*.
- The prevalence rate ranged from 0.02 - 0.07 per 100 admissions with increasing trend from year 2018 to year 2022. The highest prevalence rate was noted in year 2022 during Covid-19 pandemic.



Patient on Rx



CRE Bacteremia Mortality Rate



- Analysis of contributing factors revealed that 96% of patients had central line catheterization during the hospital stay. Prolonged hospitalization of more than 2 weeks (83%), presence of comorbidities (79%), and history of ICU admission (61%) were other contributing factors. Previous CRE colonization within last 12 months was only identified in 11% of the patient with CRE bacteremia.
- 98.7% of patients were exposed to antibiotics during the same hospitalization period with 59% of them being exposed to either β-lactam/β-lactamase inhibitor (BL/BLIs) or cephalosporin groups of antibiotics. Carbapenem was prescribed in 16% of patients prior to CRE bacteremia. Approximately one third of patients (36%) with CRE bacteremia were discharged prior to culture results available and not received treatment.
- The 30 days mortality attributed to CRE bacteremia ranged from 3.70% to 13.37%. The mortality rate was noted to be lower from year 2020 to 2022, which was inversely related to prevalence rate except in year 2023.

CONCLUSION

The annual incidence rate for cre bacteremia in HRPB was 0.02 to 0.05 per 100 admission which is much lower than one study in Oman and Korea.^{1,2} The analysis of the possible risk factors showed that central venous catheterisation are more associated with cre bacteremia.⁵ Previous CRE colonization is an independent risk factor for developing CRE bacteremia. Meanwhile, Palacios-Baena et al found that previous CRE colonization reported as significant association with CRE infection.⁴ β-lactam/β-lactamase inhibitor (BL/BLIs) and cephalosporin are the most common class of antibiotics being administered. Our results were similar with other results in which exposure to any broad-spectrum antibiotic has led to CRE bacteremia.^{1,2,3} In this review, 30 days mortality rate ranges from 3.70% to 13.37% in which it was lower compared to other study.^{1, 2, 3}

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