



# Klebsiella CP-CRE infection outbreak among liver & kidney transplant recipients – a single centre experience

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## INTRODUCTION

In Malaysia, the most common carbapenem-resistant enterobacteriales (CRE) species is Klebsiella spp. (63.8%), and the NDM gene was most prevalent (83.6%)<sup>1</sup>. We report 11 CP-CRE Klebsiella cases among 11 patients - 8 kidney and 3 liver transplant patients in Selayang Hospital since September till December 2023.

## OBJECTIVES

Primary objective was to control the CRE outbreak and secondary objective was to prevent lateral transmission of CRE cases.

## METHODS

**Urgent ad hoc meeting** with the Hospital Infection and Antibiotic Control Committee (HIACC) and heads of department was organized with the infection and prevention control unit (IPC). **Daily audits** by the infectious diseases team followed by CMEs and CNEs with the respective departments, **Pulsed Field Gel Electrophoresis (PFGE)** use to identify transmission links for targeted intervention, and patient awareness thru a **pilot educational video & printed handouts** were implemented.

## RESULTS

All the CP-CRE Klebsiella cases were tested NDM-1 strain on PCR. Other non-transplant wards also reported isolated cases of CP-CRE ie surgery, HDW, ICU and paediatrics each reported 1 cases respectively. Selected positive CP-CRE isolates on culture during a 1 week period were sent for PFGE testing including 3 kidney and 1 liver transplant recipients. 2 of the 3 kidney transplant recipients shared similar PFGE signatures – patient G and patient H showed 85.7% genetic similarities of Pattern A between them.

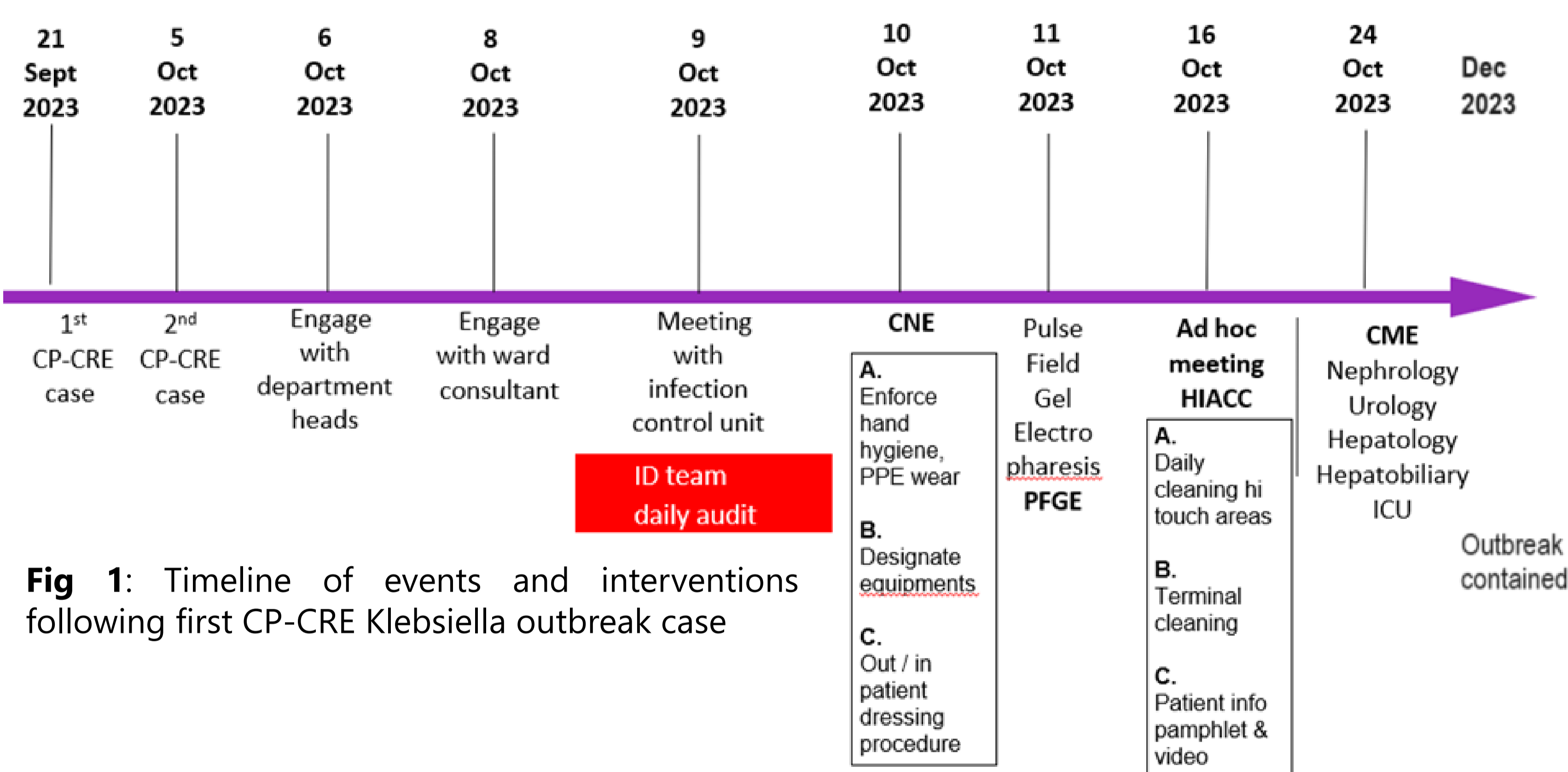


Fig 1: Timeline of events and interventions following first CP-CRE Klebsiella outbreak case

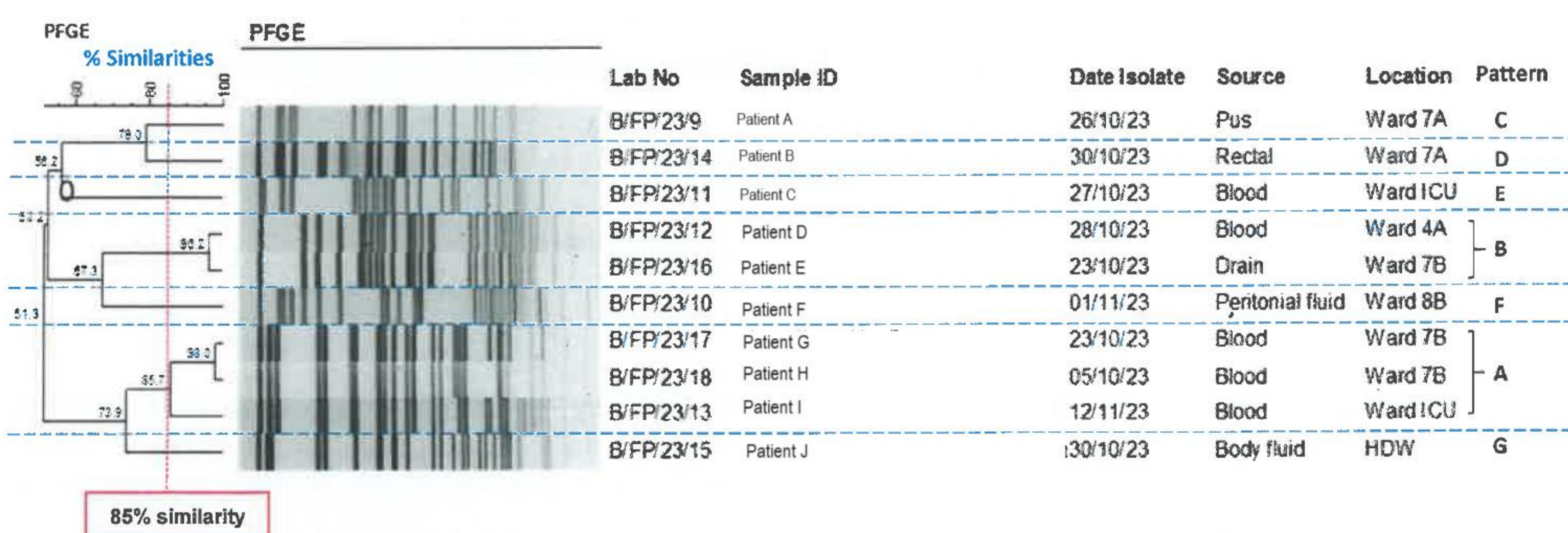


Fig 2: A dendrogram of PFGE with pattern A showing 85.7% genetic similarities between kidney transplant recipients

## DISCUSSION

Mularoni et al<sup>2</sup> concluded that the application of CDC measures in their Southern Italian Transplant Institute contributed significantly to containing CRE infections. Additionally, we find that PFGE and patient awareness thru printed and visual education are useful tools for evaluating the presence of horizontal transmission in hospital-acquired infection and as part of outbreak control measures respectively.

## REFERENCES

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- Mularoni A, Martucci G, et al. Epidemiology and successful containment of a carbapenem-resistant Enterobacteriaceae outbreak in a Southern Italian Transplant Institute. *Transpl Infect Dis.* 2019 Aug;21(4):e13119. doi: 10.1111/tid.13119. Epub 2019 Jun 11.



Fig 3: Educational printed handouts for patients diagnosed with CP-CRE infections with QR code for complimentary video.

## OUTCOME

By end of December 2023, CP-CRE Klebsiella infection cases from both nephrology and hepatobiliary departments had ceased after the strict infection ward control intervention was enforced.