

Closed intravenous systems for central vascular access: a difference maker for CLABSI rates in neonates?

Matheus F.P.T. van Rens¹, Kevin Hugil², Airene L.V. Francia¹, Mohamad Adnan Mahmah¹, Afaf Boulous J Al Shadad¹, Imelda Caseres Chiuco³ and Krisha L.P. Garcia¹

¹ Neonatal Intensive Care Unit, Hamad Medical Corporation, Qatar, ²Nursing Education, Hamad Medical Corporation, Qatar, ³ Department of Infection Control, Hamad Medical Corporation, Qatar.

Background

Infants in neonatal units are susceptible to numerous potential iatrogenic risks. One key concern is central line-associated blood stream infection (CLABSI). To ensure patient safety and reduce the incidence of CLABSI toward zero, numerous evidence-based clinical interventions and product innovations have been implemented. Nevertheless, sustaining zero CLABSI for sustained periods remains challenging.

Purpose and Outcome

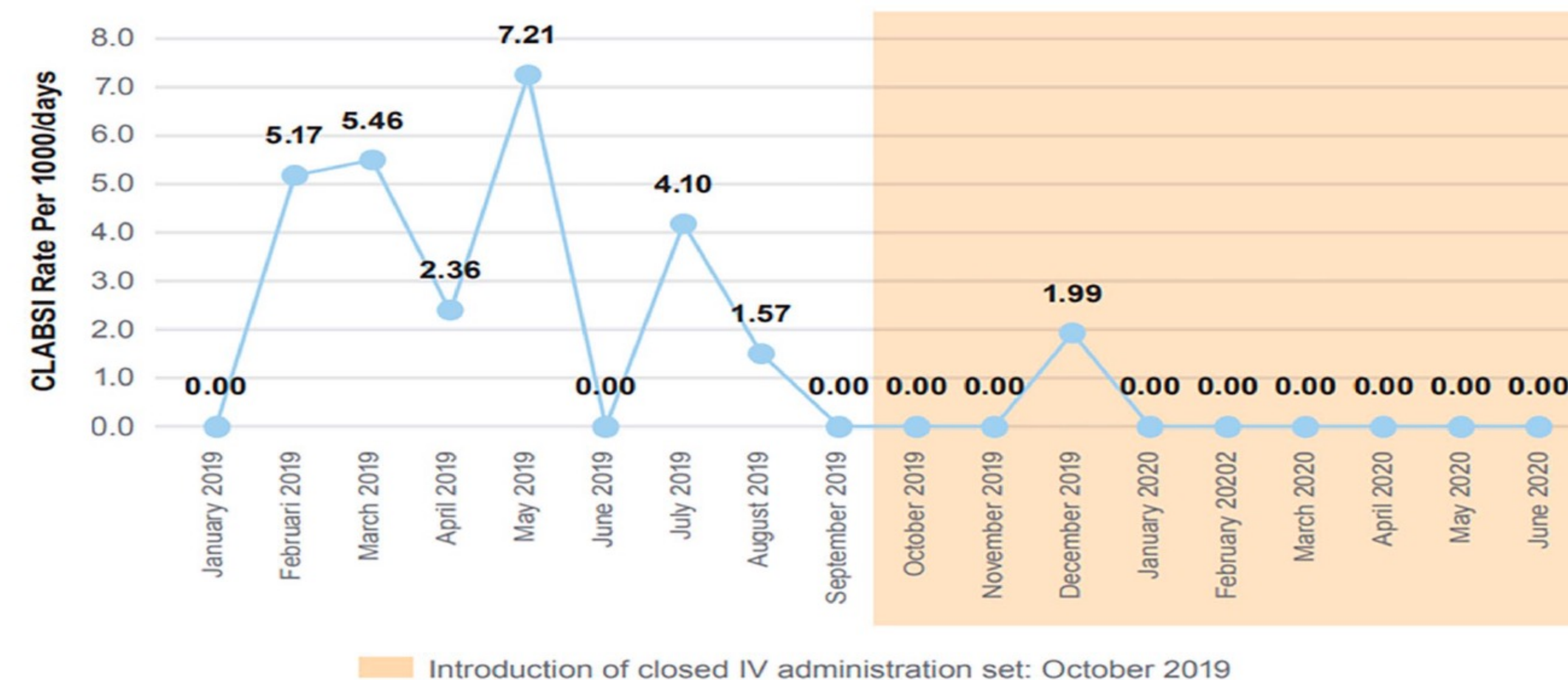
The purpose of this study was to evaluate the impact on CLABSI rates of introducing a preassembled closed intravenous (IV) administration set in a neonatal intensive care unit.

Method and Setting

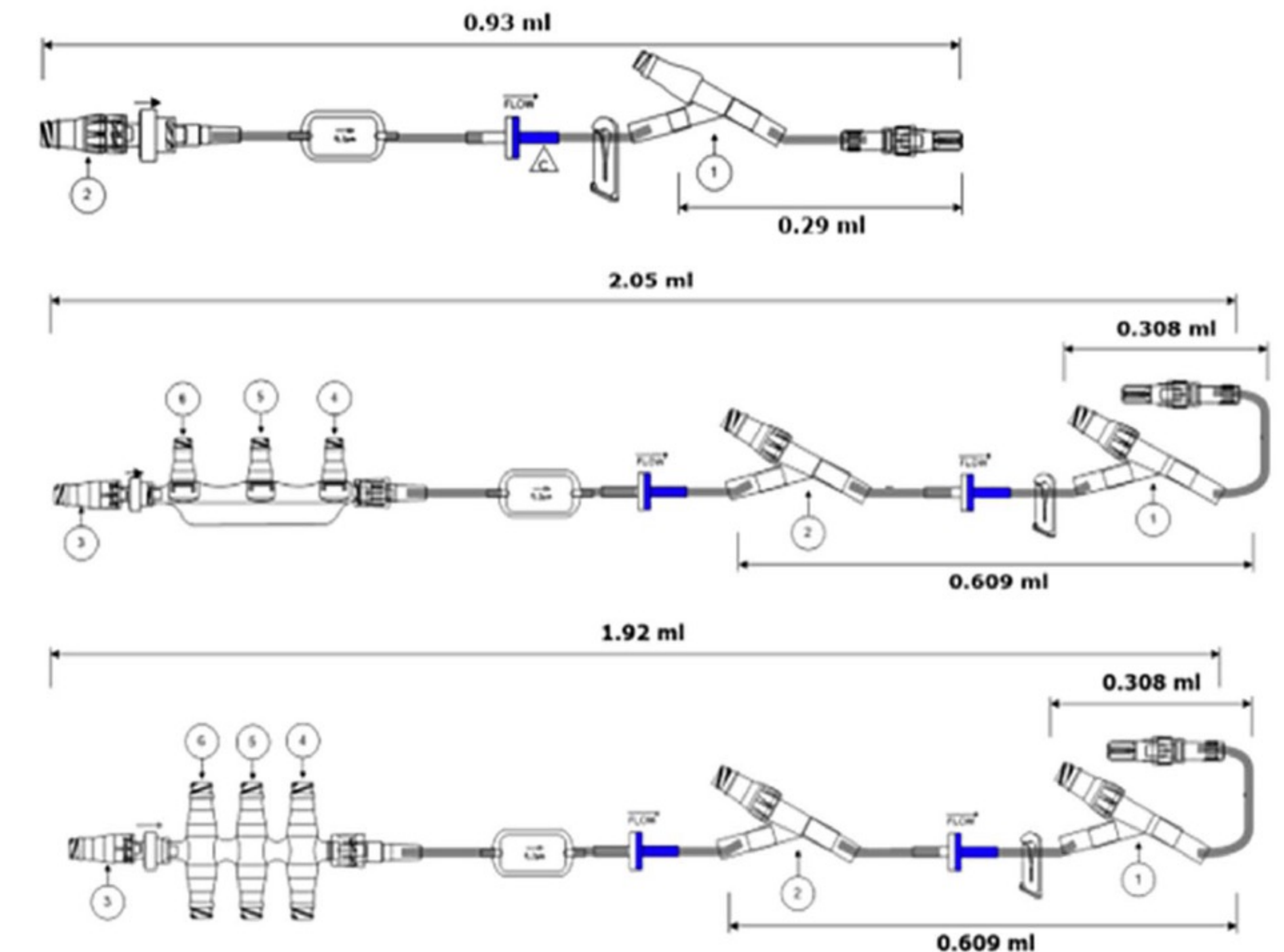
This was a retrospective observational analysis of routinely collected anonymized IV therapy infection data in a NICU. The study period was from January 2019 through June 2020.

Results

Nine-hundred eighty five patients with a Peripheral Inserted Central Catheter (PICC) were included (456 legacy IV set, 529 closed IV set). Patient demographics were comparable between the two groups. PICC dwell time was the only IV characteristic associated ($p = 0.04$) with CLABSI. Mann-Whitney U-test demonstrated significant differences between the two sets for CLABSI complication events ($p = 0.031$). Prior to using the closed IV administration sets (January 2019–September 2019) the mean monthly CLABSI rate was 2.87 (/1000 device days). This figure declined to 0.22 (/1000 device days) afterwards (October 2019–June 2020). Zero CLABSIs were observed during January to June 2020.



Closed IV administration sets with NanoClave™ needle-free connectors (set A, B, C) and manifolds (Set B, C).



Conclusion

Utilization of a pre-assembled closed IV administration set was associated with a reduction in CLABSI rates. The study results suggest that using a pre-assembled closed IV set concurrently with evidence-based central line infection control interventions can help attain extended periods of zero CLABSI.