

## **Abstract**

**Objectives:** To compare the incidence of major infections after pediatric congenital cardiac surgery (CCS) before and after implementation of the central-line associated blood stream infection (CLABSI) bundle and identify risk factors for major infections.

**Design:** We conducted a single-center, retrospective study to assess the incidence proportion of major infections including blood stream infection (BSI), surgical site infection (SSI) and ventilator associated pneumonia (VAP) following pediatric CCS one year before and after implementation of the CLABSI bundle during April 2018-March 2020. Patient demographics and outcomes were explored, and risk factors for major infections were identified using multivariate analysis.

**Results:** 548 children (53% male) underwent CCS with a median age of 1.9 years (range 0.01-17.5 years). The median Aristotle Basic Complexity score was 7.1 (range 3-14.5). The CLABSI bundle was applied in 262 patients. Overall mortality was 5.5%. 126 patients (23%) experienced major postoperative infections. During the year following CLABSI implementation, BSI was reduced from 8.4% to 3.1% ( $p=0.01$ ), with a smaller reduction of VAP (21% to 17.6%;  $p=0.33$ ). The proportion of SSI was unchanged (1.7% to 1.9%;  $p=0.77$ ). The independent risk factors of major infections were age at surgery  $< 6$  months ( $p=0.04$ ), postoperative ventilator usage  $> 2$  days ( $p < 0.01$ ), central line usage  $> 4$  days ( $p=0.04$ ), and surgery during the pre-CLABSI bundle period ( $p=0.01$ ).

**Conclusion:** Implementation of the CLABSI prevention bundle in a pediatric CCS unit reduced the incidence of BSI and VAP. Sustainability of the prevention bundle through nurse empowerment and compliance audits is an ongoing challenge.

**Trial registration:** TCTR20200420003

**Keywords:** CLABSI bundle, major infection, pediatric, cardiac surgery