**Time to Antibiotic Administration Before & After Addition to the Automated Dispensing Cabinets**

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**INTRODUCTION/HYPOTHESIS:**

The Surviving Sepsis Campaign guidelines recommend prompt intravenous antibiotic therapy within one hour for patients with possible septic shock or a high likelihood of sepsis. Despite this recommendation and the proven mortality benefit, timely antibiotic administration can be challenging. Previous studies shown a reduction in time to antibiotic administration in septic patients when the antibiotics are stocked in automated dispensing cabinets (ADC) on different hospital units. In 2020, the Medical University of South Carolina stocked anti-pseudomonas antibiotics (piperacillin-tazobactam [TZP] and cefepime [FEP]) in the ADCs in the intensive care units (ICU).

**OBJECTIVE:**

The primary objective of this study was to evaluate the time from TZP or FEP order entry to administration in ICU patients before and after adding them to the ADC.

**METHODS:**

This was a retrospective cohort study of adult, presumed septic patients who received their first dose of TZP or FEP in an ICU. Patients included from March 23, 2019 – March 23, 2020 received antibiotics from the inpatient pharmacy (Pre-ADC group) and those from March 25, 2020 – March 25, 2021 received TZP and FEP from their ADCs (Post-ADC). Patients were excluded for subsequent courses of TZP or FEP during one hospitalization, had TZP or FEP administered in the emergency department or units other than the ICU, and if antibiotics were administered prior to order entry or pharmacy verification. The primary outcome was time from TZP and FEP order entry to administration. Secondary outcomes included time from pharmacy verification to nursing administration, proportion of antibiotics administered within 1 hour of order entry, in-hospital mortality, and hospital length of stay.

**RESULTS:**

One thousand eight hundred and three patients met inclusion criteria with 903 patients in the Pre-ADC group and 900 in the Post-ADC group. Baseline characteristics were similar, and most patients received TZP. Respiratory infection was the most common indication for antibiotic administration. The median (IQR) time (minutes) from order of antibiotics to administration in ICU patients was shorter in the Pre-ADC group at 57 (32-97) vs. 75 (43-126) Post-ADC (p <0.001). Median (IQR) time from pharmacy verification to nursing administration was 51 minutes (28-91) Pre-ADC vs. 75 minutes (43-126) Post-ADC, p<0.001. Antibiotics were administered within 1 hour of order entry in 53% of patients in the Pre-ADC group vs. 40% in the Post-ADC group, p<0.001. At the time of antibiotic ordering, 40% of patients were on vasopressors in the Pre-ADC group vs. 42% in the Post-ADC group. Median time (minutes) to antibiotic administration in patients on vasopressors was also longer in the Post-ADC group, 58 (33-99) vs. 78 (42-129). More airborne, contact, and eye protection precautions were seen in the Post-ADC group (0.73% Pre-ADC vs. 36% Post-ADC). Hospital length of stay and mortality were similar between the two groups.

**CONCLUSIONS:**

The addition of TZP and FEP to the ICU ADCs did not result in earlier antibiotic administration in presumed septic patients. A major delay in antibiotic administration was seen between pharmacy order verification and nursing administration. Further investigation of barriers to antibiotic administration and areas of improvement are needed in order to optimize patient care and meet Surviving Sepsis Campaign recommendations.