FULLY AUTOMATED CENTRAL INTRAVENOUS ADDITIVE SERVICE (CIVAS): A 12 MONTH ANALYSIS OF PERFORMANCES AND IMPACT OF COVID-19 ON STERILE ANTIBIOTICS PRODUCTION

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25th Congress of European Association of Hospital Pharmacists

23-28 March 2021
VIRTUAL MEETING

Abstract number: 3PC-071

BACKGROUND

- In 2014, the hospital pharmacy started a project to implement a CIVAS unit for supplying ready-to-administer non-hazardous injectable drugs to the wards. A pre-feasibility study was performed, a new-built class C cleanroom equipped with the robotic system APOTECAunit, and the fully-automated aseptic production process validated (1).
- In 2016, CIVAS has started producing standard doses of chemotherapy supportive treatments (palonosetron, ondansetron, dexamethasone) for the oncology and hematology units.
- Afterwards the production was shifted to antibiotics (cefazolin, piperacillin-tazobactam, ceftriaxone) and pantoprazole for Infectious Disease, Cardiac Surgery, and Emergency Medicine departments.
- Nowadays, the in-advance production preparations in series at CIVAS is mainly based on daily consumption and performed by one pharmacy technician and one pharmacist (0.25 full time equivalent each). The daily working time is from 8 am to 4 pm (Monday–Friday).

OBJECTIVE

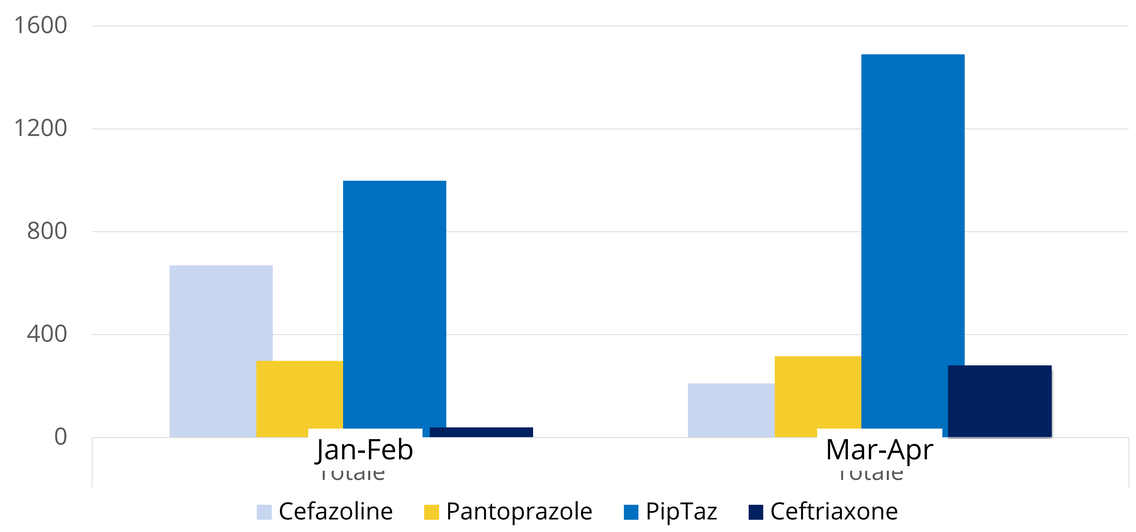
The aim of this study was to analyse the CIVAS performances over the last 12 months and evaluate the impact of COVID-19 pandemic on increasing demands of sterile antibiotics by emergency departments.

MATERIAL AND METHODS

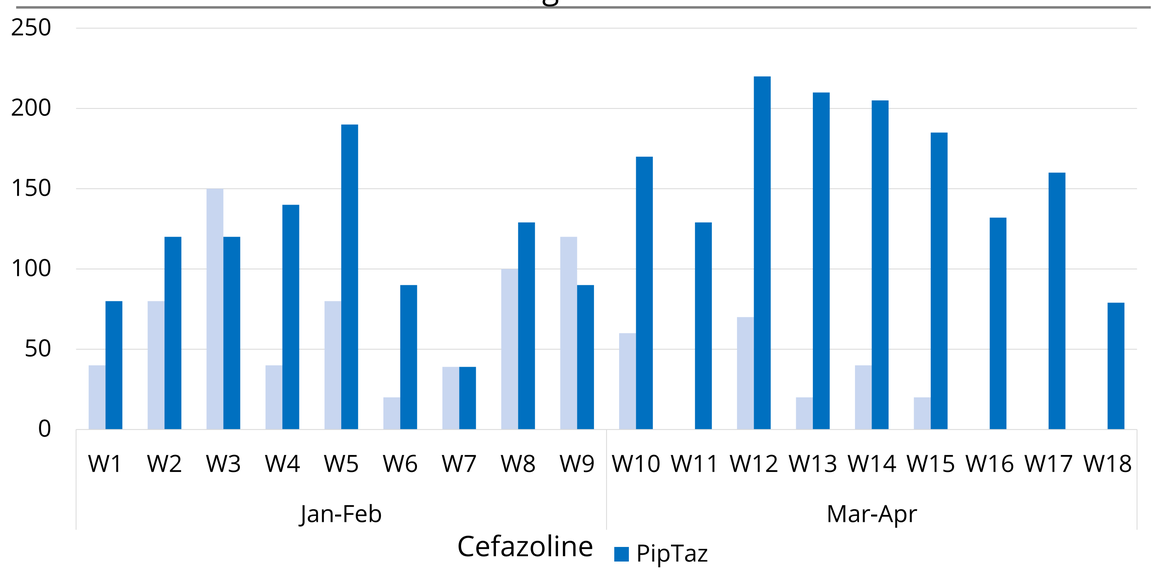
Overall CIVAS production, dosage accuracy, and average production time (APT) of the ready-to-administer preparations were evaluated over a period of 12 months (from September 2019 to August 2020). Data were retrieved from the APOTECA statistical tool.

RESULTS

- 12,215 preparations were compounded;
- 26% in syringe and 74% in 100ml NaCl 0,9% infusion bags;
- 98.9±1% average dosage accuracy of all preparations;
- +28% increase of weekly production during the peak of Italy's COVID-19 outbreak (March 2020);
- Pantoprazole preparations remained steady over time;
- Piperacillin-tazobactam and ceftriaxone for the emergency departments raised considerably (+19% and 9%, respectively);
- Cefazolin for Cardiac Surgery department decreased by 26%.



Active substance	Preparation	Total nr .of preparations	ATP (sec)
Cefazoline	1,000mg undiluted in 10mL syringe	909	125
Piperacillin-tazobactam	4.5g in 100mL NaCl 0.9% infusion bag	2488	203
Pantoprazole	40mg in 100mL NaCl 0.9% infusion bag	614	196
Ceftriaxone	40mg in 100mL NaCl 0.9% infusion bag	318	177



CONCLUSION

The implementation of a fully- automated CIVAS guarantees the possibility of measuring and controlling every step of the whole production process of ready-to-administer preparations.

The study revealed that CIVAS was able to meet increasing demands of sterile antibiotics during the pandemic crisis, thereby supporting the emergency units and providing the highest level of quality and safety.

(1) C. Bufarini "Centralized non-hazardous intravenous compounding: improvement of clinical practice" Eur J Hosp Pharm 2018

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