BACKGROUND: According to actual PK/PD concepts, the use of continuous infusion (CI) of beta-lactams could increase their likelihood of therapeutic success. Although this strategy has been described in hospital setting, it is poorly documented for outpatient parenteral antimicrobial therapy (OPAT). We aimed to evaluate the efficacy, safety and global savings following the introduction of an OPAT pathway for CI of piperacillin/tazobactam (TZP), temocillin (TMO) and ceftazidime (CAZ).

METHODS: This study is a monocentric retrospective data collection. Between June 2014 and December 2016, adult patients with the following criteria were included in the study: treated ≥48h with IV antibiotics in hospital, (ii) who still need IV antibiotics (TZP, TMO or CAZ) more than one day and for at least 3 additional days and, (iii) who are suitable for OPAT. For CI, elastomeric devices were systematically used and placed through a peripherally inserted central catheter (PICC).

The clinical outcome was evaluated on infection markers, culture results, assessment of the patient clinical condition, relapse within 2 months. Savings were calculated as follow: saved bed days = duration of OPAT & cost savings = (duration of OPAT x cost of hospital bed) – (cost of OPAT team + antibiotic + PICC line + elastomeric device). Exclusions to bed and financial savings were: any patient(s) who had a clinical outcome of (failure, indeterminate or relapsed), developed an adverse reaction or died.

RESULTS: Fifty patients included. Patients were mainly treated for pulmonary infections and urosepsis. Clinical outcome and savings were as below:

- Infection resolution rate (%): 93 for TZP, 100 for TMO & 80 for CAZ
- Overall bed savings was a total of 641 days
- Estimated overall financial savings: €94347

CONCLUSIONS: OPAT is crucial to decrease bed cost and pressure in hospital while offering patients optimal treatment and improved quality of life. This goal is supported by use of CI in OPAT which:

- decreases the frequency of visiting by OPAT team,
- improves the efficacy and well tolerated and (iii) economically profitable.

Penicillins such as Piperacillin/tazobactam (TZP), Temocillin (TMO) & β-lactam antibiotics such as ceftazidime (CAZ) exhibit time dependent bacterial kill. Maintaining free levels above the minimum inhibitory concentration (MIC) for a percentage of the dosing interval (50% for penicillins & 60% for cephalosporins), will ensure near maximal bactericidal effect (1). There are relatively few intravenous (IV) antibiotics with gram negative action for once daily outpatient use to treat resistant Gram negative infections. It has been suggested that administering TZP by CI produces a drug concentration in excess of the MIC for a longer period which may achieve improved outcomes in critically ill patients (2). Pharmacodynamics optimisation of TZP by manipulation of infusion times may be particularly useful in the treatment of infection caused by less susceptible pathogens (3). Administering TMO as a CI produces a stable free serum concentration above the breakpoint (4) and stability by CI as well as elastomeric pumps were both published (5,6). CAZ stability as CI is supported by literature (7).

Following the introduction of an OPAT pathway for CI, we aimed to evaluate the efficacy, safety and to calculate overall savings including bed days saved out of hospital and financial savings.

CONCLUSIONS

A continuous β-lactam intravenous Antibiotic infusion for (TZP, TMO & CAZ) over 24 hours for OPAT appears to be clinically effective, safe, practical and cost effective. Only 2 patients in the PIP/TAZ group experienced adverse events (diarrhoea and rash) which were unlikely due to the infusion but the drug itself.

OPAT is crucial to decrease bed and cost pressure in hospital while offering patients optimal treatment and improved quality of life. This goal is supported by use of CI in OPAT which:

(i) reduces the frequency of visiting by OPAT team, (ii) effective and well tolerated and (iii) economically profitable.

REFERENCES

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