

correct initial vancomycin dose, requiring $\geq 25\%$ increase in the total vancomycin dose.

Regarding TDM dosage adjustments, 63.4% of patients required an increase in the total daily dose (77% needed a shorter dosing interval while 23% needed higher doses with the same dosing interval).

Conclusion and relevance More than a half of the patients had subtherapeutic vancomycin levels. Initial underdosage was the main cause of subtherapeutic levels. Nevertheless, 22.2% required $\geq 25\%$ increase in dose to achieve target drug concentrations despite an initial therapeutic regimen, according to previous evidence. Shortening the dosing interval was the main TDM dosage adjustment, probably due to increased vancomycin clearance in this population.

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No conflict of interest.

4CPS-036 PHARMACEUTICAL INTERVENTIONS IN A SMALL HOSPITAL

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Background and importance One of the functions of a pharmacist is to validate the prescribed treatment by the doctor, taking into account efficacy, safety, adequacy and cost.

Aim and objectives To analyse pharmaceutical interventions (PI) in prescribed treatment in a 115 bed hospital, and to quantify the degree of acceptance.

Material and methods This descriptive study included patients with an antibiotic prescription whose PI were analysed over a period of 11 months (2018 and 2019). The collected data were: demographic data, antibiotic treatment and indication, duration of treatment, comorbidities and abnormal analytical values (glomerular filtrate, potassium level, C reactive protein), type of PI and acceptance rate of PI. PI were classified as: actions on efficacy, actions on safety, actions on adequacy and actions on cost. The acceptance rate of the PI was detected based on modifications to the medical prescription according to the recommendations. The pharmaceutical recommendations were made through daily assessments of the patient's history or talking by phone with the physician.

Results A total of 438 patients were studied and a PI was made in 1 of 3 patients (163 PI). The interventions were made in antibiotic and non-antibiotic prescriptions. Actions on efficacy: antimicrobial change after antibiogram (11%), antimicrobial inadequate posology (3%) and adding an antibiotic to get a broad antibacterial spectrum (3%). Actions on safety: dose adjustment due to renal failure (15%), dose adjustment due to adverse reaction (0.6%), suspending the drug due to an adverse reaction, contraindication or interaction (4%), suspending the antibiotic due to inadequate duration (20%), inadequate posology (2.4%), therapeutic duplicity (4%), actions on potassium as monitoring levels, increase or decrease in

potassium dose (2.4%) and other (antithrombotic prophylaxis and monitoring nephrotoxicity by aminoglycosides (1.8%)). Actions on adequacy and cost: change to oral administration (24%).

A total of 58% (94/163) of PI were accepted. Most PI not accepted (40/69) were recommendations about change to oral administration or suspending the antibiotic. The reasons for non-acceptance were clinical deterioration or the patient was discharged.

Conclusion and relevance More than half of the pharmaceutical interventions resulted in a change in the medical prescription according to the recommendation. Pharmaceutical validation ensures safety in the hospitalisation process and represents an improvement in quality of care.

REFERENCES AND/OR ACKNOWLEDGEMENTS

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4CPS-037 CLINICAL OUTCOME IN PAEDIATRIC INTENSIVE CARE UNIT PATIENTS TREATED WITH VANCOMYCIN

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Background and importance Vancomycin, a glycopeptide antibiotic, is used for the treatment of serious infections by gram positive microorganisms, especially methicillin resistant *Staphylococcus aureus* (MRSA). However, the attributable mortality of paediatric patients treated with vancomycin in paediatric intensive care units (PICU) has been limited.

Aim and objectives Our study aimed to determine the factors influencing mortality of paediatric patients treated with vancomycin in the PICU.

Material and methods A retrospective study was conducted in paediatric patients admitted to the PICU who received vancomycin from April 2018 to April 2019. We investigated variables such as age, sex, underlying disease, diagnosis, length of stay in the PICU, paediatric index of mortality 2 score, mechanical ventilator use, renal replacement therapy, laboratory data, dose, level of vancomycin and mortality rate.

Results A total of 160 paediatric patients were enrolled (median age 12 months (range 2–180), 69.4% male). The percentage of patients reaching therapeutics trough levels of vancomycin (10–20 mg/L) was 32.5% (n=52). Septic shock was the most common diagnosis (49.3%) and mortality rate was 39.4%. Our study found that children who had vancomycin levels outside the therapeutic range, and used mechanical ventilation and renal replacement therapy were associated with a higher mortality rate (OR 3.14, 95% CI 1.34–7.35, p=0.008; OR 6.1, 95% CI 1.6–22.7, p=0.007; and OR 10.4, 95% CI 2.6–41.4, p=0.001, respectively).

Conclusion and relevance Improper therapeutic vancomycin levels, mechanical ventilator use and renal replacement therapy are factors associated with mortality in the PICU.

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4CPS-038 STABILITY TO HIGH TEMPERATURES OF THE ANTIMICROBIALS USED IN OUTPATIENT PARENTERAL ANTIMICROBIAL THERAPY PROGRAMMES

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Background and importance Outpatient parenteral antimicrobial therapy (OPAT) programmes allow the administration of intravenous antimicrobials to non-hospitalised patients, offering numerous advantages. During administration, antimicrobial solutions could experience an increase in temperature after exposure to room temperature. However, studies on stability at high temperatures (35–37°C) are still very scarce.

Aim and objectives To collect high temperature stability data (35–37°C) for antimicrobials used in an OPAT programme.

Material and methods Antimicrobials used in the OPAT programme of two third level hospitals were compiled. Different sources of information were consulted (data sheet, Stabilis and Micromedex) to find stability studies for each antimicrobial at high temperatures (35–37°C). Data were classified in three groups: antimicrobials with stability data at concentrations used in OPAT, antimicrobials with stability data at other concentrations and antimicrobials without stability data.

Results The stability of 24 antimicrobials was studied: in 16.66% of cases, stability studies were found at the temperatures mentioned for the concentrations used; in 50% of cases there were stability data, but for concentrations other than those used in clinical practice and in the remaining 33.33%, there were no published data for the aforementioned temperatures.

- Stability data found:
 - a. At the concentrations used: acyclovir 3–5 mg/mL (2 weeks), cefazolin 12.5–25 mg/mL (12 hours), gentamicin 2.5 mg/mL (96 hours) and voriconazole 2 mg/mL (4 hours).
 - b. Other than the concentrations used: aztreonam 60 or 100 mg/mL (24 hours), ampicillin 0.0125 mg/mL (24 hours), cefepime 0.5 mg/mL (4 hours) and 50 mg/mL (13 hours), ceftazidime 0.1 mg/mL (2 hours) and 120 mg/mL (8 hours), ceftriaxone 10 mg/mL (2 weeks), clindamycin 0.25 mg/mL (24 hours), daptomycin 100 mg/mL (6 hours), meropenem 5 mg/mL (4 hours), piperacillin–tazobactam 128/16 mg/mL (24 hours), penicillin G 0.13 MUI/mL (5 hours), tobramycin 20 mg/mL (3 weeks) and vancomycin 1 mg/mL (4 days).

- c. Antimicrobials without studies at high temperatures: amphotericin B, cloxacillin, ertapenem, fosfarnet, fluconazole, ganciclovir, sulbactam and teicoplanin.

Conclusion and relevance

- Stability data at high temperatures were scarce for the antimicrobials used in the OPAT programme. It would be convenient to carry out corresponding studies.
- In warm environments, where the OPAT programme is established, antimicrobials and their concentrations should be adapted to the available information.

REFERENCES AND/OR ACKNOWLEDGEMENTS

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4CPS-039 NOSOCOMIAL INFECTION BY MULTIRESTANT PATHOGENS IN KIDNEY TRANSPLANT PATIENTS

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Background and importance Immunosuppression related to organ transplant is a risk factor for multidrug resistant infections.

Aim and objectives To evaluate the prevalence of nosocomial infections (NI) by multidrug resistant (MDR) pathogens, aetiological agents and treatments given to a cohort of patients undergoing kidney transplantation (KT).

Material and methods A retrospective observational study was carried out in a cohort of patients having undergone a KT during 2016–2017. Variables collected: demographics, clinical (type of KT and aetiological agent) and therapeutic (induction immunosuppressant treatments and empirical and targeted antimicrobials) data.

Results Sixty-four patients who had undergone a KT (84.4% from a cadaver, 7.8% from a live donor and 7.8% kidney–pancreas) were included (mean age 53.6±15.3 years, 72.9% men).

The most frequent induction immunosuppressant treatments were: basiliximab+mycophenolate–mofetil+steroid+tacrolimus (31.2%) and thymoglobulin+mycophenolate–mofetil+steroid+tacrolimus (65.6%).

Eight of 64 patients developed NI by MDR pathogens during hospitalisation as a result of the KT (prevalence 12.5%), isolating a total of 10 multiresistant causative agents: *Escherichia coli* (30%), *Pseudomonas aeruginosa* and *Klebsiella pneumoniae* (extended spectrum beta lactamase producing, oxa-48 carbapenemase producing (20% each) and carbapenemase producing (10%)).

The sources of NI were: urinary tract (50%), central venous catheter (30%) and abdominal (20%).

Based on patient symptoms, empirical administered antibiotics were: ceftazidime (30%), ciprofloxacin (20%), ceftriaxone (20%), meropenem, levofloxacin (10%) and piperacillin–tazobactam (10%). In all cases, once the aetiological agent was isolated, targeted treatment was used.

It is worth noting the use of ceftazidime–avibactam in two cases of infection with MDR carbapenemase oxa-48 producing *K pneumoniae*. None of the patients died due to the NI. Of the patients treated with the immunosuppressant regimen that included basiliximab, 40% developed NI by MDR pathogens in contrast with the group that received the regimen including