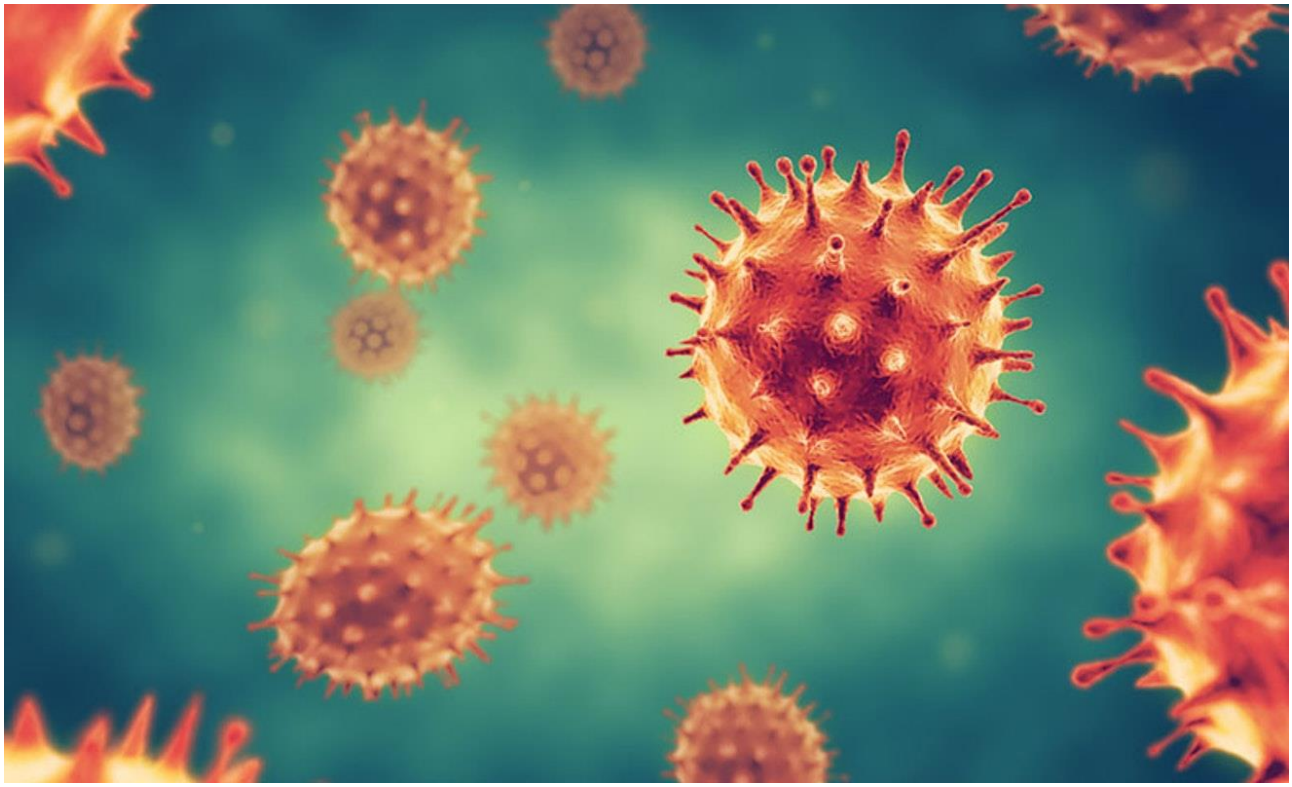
2021 | 1

BELGIAN JOURNAL OF HOSPITAL PHARMACY



BJHP is the official scientific journal of the Flemish Association of Hospital Pharmacists

Vlaamse Vereniging van Ziekenhuisapothekers

TABLE OF CONTENTS

BELGIAN JOURNAL OF HOSPITAL PHARMACY

Vlaamse Vereniging van Ziekenhuisapothekers

Hospital Pharmacists' Day 2021
February 2, 2021
San Marco Village, Schelle, Belgium

This publication contains the abstracts of oral and poster presentations in the field of hospital pharmacy presented at the 'Hospital Pharmacists' Day' held by the Flemish Association of Hospital Pharmacists via broadcasting from Schelle (Belgium) on February 2, 2021.

For this event, fifteen abstracts were submitted. Four abstracts were accepted for both oral and poster presentation. Eleven abstracts were accepted for poster presentation. This publication contains seven abstracts for which the BJHP received approval for publication in the BJHP by the submitting author.

The best two posters presentations will be awarded the 'Amgen Scientific Award for Hospital Pharmacists'.

ORAL AND POSTER PRESENTATIONS

POSTER PRESENTATIONS

ORAL AND POSTER PRESENTATIONS

OP 1 | Clinical validation of vancomycin population pharmacokinetic models in adults.

Astrid Heus[1], David Uster[2], Sebastian Wicha[2], Annemie Somers[1], Veerle Grootaert[3], Nele Vermeulen[4], Pieter De Cock[1]

[1]Department of Pharmacy, Ghent University Hospital, Ghent, Belgium
[2]Department of Clinical Pharmacy, Institute of Pharmacy, University of Hamburg, Hamburg, Germany
[3]Department of Pharmacy, General Hospital Sint-Jan Brugge-Oostende AV, Bruges, Belgium
[4]Department of Pharmacy, OLV Hospital Aalst, Aalst, Belgium

BACKGROUND
Model-informed precision dosing (MIPD) is an innovative technique used for individualized dose optimization of drugs, eg. vancomycin, based on patient characteristics and a suitable population pharmacokinetic model, possibly combined with individual measured drug plasma concentrations.
Objective: The aim of this study was to identify a suitable population pharmacokinetic (popPK) model of vancomycin for bedside MIPD in adult patients.
METHODS
A systematic literature review was performed to identify popPK models that describe the pharmacokinetics of vancomycin in adults. Clinical and therapeutic drug monitoring data from patients receiving continuous vancomycin in three Belgian hospitals were collected retrospectively. Measured plasma concentrations were compared to model predictions in the a priori setting (based on patient characteristics and dosing information) and the a posteriori setting (combination of patient characteristics, dosing information and individual TDM data). The predictive performance was assessed by calculating relative bias (rbias) and relative root mean square error (rRMSE) as a measure for inaccuracy and imprecision of the model prediction. The most suitable model was defined as the model with the lowest rBias and rRMSE of a priori and a posteriori predictions.
Results: The predictive performance of 23 popPK models was evaluated based on clinical data of 181 patients and 923 TDM samples. For the a posteriori scenarios, the third plasma concentration was predicted using the first, second and both the first and second measured plasma concentration. In general, accuracy and precision of the a posteriori predictions were superior to the a priori predictions. Overall, the model of Colin et al.1 and Okada et al.2 were shown to have the best predictive performance.
CONCLUSION
Large differences in model predictive performance were observed. The models of Colin et al.1 and Okada et al.2 were identified as most suitable for individualized dose optimization of vancomycin in an adult patient population.

REFERENCES

1. P. J. Colin et al., "Vancomycin Pharmacokinetics Throughout Life: Results from a Pooled Population Analysis and Evaluation of Current Dosing Recommendations," Clin. Pharmacokinet., 2019.
2. A. Okada et al., "Population Pharmacokinetics of Vancomycin in Patients Undergoing Allogeneic Hematopoietic Stem-Cell Transplantation," J. Clin. Pharmacol., 2018.

POSTER PRESENTATIONS

PP 1 |Development and external validation of an online clinical prediction model for augmented renal clearance in adult mixed critically ill patients: the ARC predictor

Matthias Gijsen[1], Chao-yuan Huang[2], Marine Flechet[2], Ruth Van Daele[1], Peter Declercq[1], Yves Debaveye[2], Philippe Meersseman[2], Geert Meyfroidt[2], Joost Wauters[2], Isabel Spriet[1]

[1]Pharmacy Department, Department of Pharmaceutical and Pharmacological Sciences, University Hospitals Leuven and Clinical Pharmacology and Pharmacotherapy, KU Leuven, Leuven, Herestraat 49, B-3000 Leuven, Belgium.
[2]Clinical Division and Laboratory of Intensive Care Medicine, Academic Department of Cellular and Molecular Medicine, KU Leuven, Leuven, Herestraat 49, B-3000 Leuven, Belgium.

BACKGROUND & AIM
Augmented renal clearance (ARC) might lead to subtherapeutic plasma levels of drugs with predominant renal clearance. Early identification of ARC remains challenging for the intensive care unit (ICU) physician. We developed and validated the ARC predictor, a clinical prediction model for ARC on the next day during ICU stay, and made it available via an online calculator. Its predictive performance was compared with that of two existing models for ARC, i.e. the ARC score and the ARCTIC score.
METHODS
A large multicenter database including medical, surgical and cardiac surgery ICU patients (n = 33258 ICU days) from three Belgian tertiary care academic hospitals was used for the development of the prediction model. Development was based on clinical information available during ICU stay. We assessed performance by measuring discrimination, calibration and net benefit. The final model was externally validated (n = 10259 ICU days) in a single-center population.
RESULTS
ARC was found on 19.6% of all ICU days in the development cohort. Six clinical variables were retained in the ARC predictor: day from ICU admission, age, sex, serum creatinine, trauma and cardiac surgery. External validation confirmed good performance with an area under the curve of 0.88 (95% CI 0.87 – 0.88), and a sensitivity and specificity of 84.1 (95% CI 82.5 – 85.7) and 76.3 (95% CI 75.4 – 77.2) at the default threshold probability of 0.2, respectively.
CONCLUSION
ARC on the next day can be predicted with good performance during ICU stay, using routinely collected clinical information that is readily available at bedside. The ARC predictor is available at www.arcpredictor.com.

PP 2 |Feasibility of continuous administration of antimicrobials in the hospital: nothing is ever as it seems?

V. Grootaert[1], K. Bigler[1], A. Bervoet[2], J.T. Van Praet[3], E. Nulens[4]

[1]Pharmacy Dpt., AZ Sint-Jan Brugge-Oostende AV hospitals, Bruges, Belgium.
[2]Intravenous Vascular Acces Team, AZ Sint-Jan Brugge-Oostende AV hospitals, Bruges, Belgium.
[3]Dpt. of Nephrology & Infectious Diseases, AZ Sint-Jan Brugge-Oostende AV hospitals, Bruges, Belgium.
[4]Dpt. of Laboratory Medicine, AZ Sint-Jan Brugge-Oostende AV hospitals, Bruges, Belgium.

KEYWORDS
Antimicrobials, continuous infusion, drug incompatibility
BACKGROUND & AIM
Continuous infusion (CI) of antimicrobials is increasingly applied because of its pharmacokinetic and practical advantages, including the rapid achievement of stable target serum concentrations, the easiness of sampling since levels are determined during steady state and the simple interpretation of therapeutic drug monitoring. Our objective was to assess medication administration practices related to the CI of antimicrobials.
METHODS
During a 10-day prospective observational survey in March 2019, we enrolled all consecutive hospitalized non-ICU patients, who received at least one antimicrobial suitable for CI. Catheter type, number of lumens, route of administration, loading-and maintenance dose and pump settings were assessed by comparing the electronic prescription and patient file with the observations. Drug incompatibilities (DI) were analyzed using the compatibility information provided in Trissel's 2 Clinical Pharmaceutics Database and categorized as compatible, incompatible, uncertain or none. DI was defined as an incompatibility or uncertainty about the compatibility between at least 2 simultaneously Y-site administered drugs.
RESULTS
107 observations in 86 patients were performed and 113 antimicrobial prescriptions were analyzed. Peripheral lines were most commonly used (53%), followed by central venous catheters (35%) and peripherally inserted central catheters (10%). Single, double, triple, quadruple lumen catheters accounted for 56%, 23%, 17%, and 4% respectively. CI-therapy was prescribed, according to hospital guidelines, in 96% of patients, 93% of which received a loading dose. In 96% of cases a correct maintenance dose was administered. Only 63% of the infusion bags or syringes were labeled appropriately. In 7% of the observations, the pump settings did not match the prescribed dose, causing both over- and under dosing in three patients (respectively defined as >105% and <95% of the prescribed daily dose). We observed DI's in 28% (30/107) of cases, mostly with single-lumen catheters (63%), and in hematological patients(37%). Moreover,

change from CI to intermittent infusion was the only solution to overcome DI in 73% of these cases.

DISCUSSION/CONCLUSION

Matters related to the administration of the antibiotic were common in continuous infusion of antimicrobials. In respons, we started with educational sessions, the hospital policy was slightly adapted including the allowance of intermittent infusion in case of DI and a prescribing alert that can be used by nurses or physicians to request for a DI check by the clinical pharmacist, was implemented.

PP 3 |TDM base camp: a pharmacist's essential skill or useless time fill?

V. Grootaert[1], J.T. Van Praet[2], E. Nulens[3]

[1]Pharmacy Dpt., AZ Sint-Jan Brugge-Oostende AV hospitals, Bruges, Belgium.
[2]Dpt. of Nephrology & Infectious Diseases, AZ Sint-Jan Brugge-Oostende AV hospitals, Bruges, Belgium.
[3]Dpt. Of Laboratory Medicine, AZ Sint-Jan Brugge-Oostende AV hospitals, Bruges, Belgium.

KEYWORDS

Antimicrobial therapy, Therapeutic drug monitoring, clinical pharmacy

BACKGROUND & AIM

Therapeutic drug monitoring (TDM) is a useful and practical tool to integrate PK and PD knowledge for optimal personalized antimicrobial therapy. The goal of TDM is to assure adequate drug exposure, to minimize adverse drug reactions and to reduce the development of antimicrobial resistance. However, despite the fact that TDM guidelines are straightforward, the clinical reality is rather complex. A coordinator, as part of the antimicrobial stewardship team, has to play an important role in safeguarding the interpretation of TDM results in daily practice. Clinical pharmacists have an bird's-eye view of the patient treatment (laboratory results, medication overview, hours of administration anti-infective drug, patient population) and are trained in the PK/PD of anti-infective drugs. Therefore a TDM-service led by the clinical pharmacist, TDM base camp, was implemented and evaluated.

METHODS

TDM flowcharts per anti-infective drug were developed and validated by an expert panel of infectious diseases specialists, microbiologists and clinical pharmacists. Pharmacists were trained to interpret the TDM results by taking a short course and passing a case-driven test. A software-application (Apotplus®) which incorporates information necessary for making dose recommendations was developed. Pharmacist's actions were performed by contacting the physician by phone and adding a note in the electronic patient file.

A retrospective observational analysis was performed to evaluate the efficiency of the TDM service by measuring the number of recommendations given by the pharmacist, the grade of acceptance and the daily time needed to fulfill the TDM service.

RESULTS

During a 9 month period (January–September 2020), 1415 TDM results of 325 patients were analyzed by the clinical pharmacist. Dose recommendations were made in 16% of the reviewed TDM results with an overall acceptance rate of 80%.

The most prevalent recommendations were made for vancomycin (75%), followed by voriconazole (22%). Half of the recommendations (49%) concerned an increase or reduction in dose. In more than one third of the advices (34%), a new TDM sample was advised because of sampling issues.

The daily median time to perform the TDM consults was 31 minutes [20-45 min] with an average of 8 TDM consultations a day.

DISCUSSION/CONCLUSION

The implementation of a pharmacist driven and software supported TDM service resulted in a time efficient way to make dose recommendations, yielding a high acceptance rate.

PP 4 |Personalized QT risk assessment – to inform medication prescribing?

Hallaert M.[1], Desmet S.[1], Grootaert V.[1]

[1]Pharmacy Dpt, AZ Sint-Jan Brugge-Oostende AV hospitals, Bruges, Belgium.

BACKGROUND AND AIM

QTc-interval prolongation can lead to Torsades de Pointes(TdP) which can result in sudden cardiac death. Several risk factors (certain drugs and patient related factors) can produce QT-prolongation1. AzCERT2 categorizes these drugs. In our hospital, the pharmacist provides 'QT-advice' for each prescription of a QT-drug with known risk of TdP (CredibleMeds list KR). In 2019, the pharmaceutical guideline for giving QT-advice was adjusted in collaboration with the cardiologists.

OBJECTIVE

To compare the feasibility and clinical relevance of QT-advice guided by the original and adapted QT-guideline.

METHODS

QT-advices provided by the pharmacist were analyzed. This retrospective analysis includes: number of QT-advices given according to the original (April2018-January2019) and the adapted guideline (May2019-October2019), number of QT-drugs (defined as drugs on CredibleMeds list KR) per prescription and QTc-interval>500ms (if known). During 1 month (15May-14June2019) the acceptance rate of the pharmaceutical advices, including the QT-advices were registered.

RESULTS

The differences between the original and adapted guideline are: (1) threshold for advising an ECG (original: ≥2prescribed QT-drugs or 1QT-drug in combination with a drug that inhibits the metabolism of QTdrug - adapted: ≥1prescribed QT-drug) and (2) definition of a recent ECG (original: maximum 1year old, adapted: during hospitalization). If no recent ECG is available or QTc-interval >500ms, advice is given to the physician.

The number of advices given by using the original and adapted guideline were respectively, 78 (8advices/month) and 243 (41advices/month). In average, using the adapted guideline, 5 advices per month were related to QTc-interval

≥500ms and only 1 using the original guideline. The acceptance rate of QT-advice was 40% with an overall acceptance rate of 79% for all pharmaceutical advices.

DISCUSSION/CONCLUSION

Adapting the QT-flow resulted in a fivefold increase of QT-advices. The rather low acceptance rate may be explained by the fact that the pharmacist only selects patients upon QT-drug prescriptions. To enhance the number of clinically relevant advices, patient related risk factors (hypokalemia, age, gender, cardiovascular co-medications) should be included. It is therefore necessary that personalized risk assessment systems help the pharmacist to identify patients at greatest risk for QT-prolongation.

LITERATURE

1. VANDAEL, Eline, et al. Risk factors for QTc-prolongation: systematic review of the evidence. International journal of clinical pharmacy, 2017, 39.1: 16-25
2. Arizona Center for Education and Research on Therapeutics https://www.crediblemeds.org/

PP 5 |Implementatie, evaluatie en optimalisatie van clinical decision rules in het Ziekenhuis Oost-Limburg

Hulshagen Toon[1,2], Stragier Marnik[1]

Ziekenhuisapotheek, Ziekenhuis Oost-Limburg, Genk[1]
Faculteit farmaceutische wetenschappen, KU Leuven, Leuven[2]

ACHTERGROND & DOELSTELLING

Clinical decision rules (CDR) zijn beslissingsbomen die patiënten screenen op ongunstige combinaties van o.a. geneesmiddelen en/of afwijkende labowaarden.

Recent werden in het Ziekenhuis Oost-Limburg (ZOL) CDRs geïmplementeerd. Deze studie evalueert de performantie en optimalisatie hiervan om tot een zo gunstig mogelijke werking te komen binnen de dagelijkse klinische validatie.

METHODEN

Er werden vijf commercieel beschikbare CDRs aangekocht die inhoudelijk opgesteld en gevalideerd werden door de Nederlandse Vereniging van Ziekenhuisapothekers.

Van 12/11/2019 tot 31/12/2020 worden alle opgenomen ZOL-patiënten gescreend met behulp van de CDRs.

Vier key performance indicatoren nl. aantal meldingen, aantal adviezen, hun verhouding ten opzichte van elkaar (=positief predictieve waarde (PPV)) en de acceptatiegraad, werden globaal en per rule gemeten. De resultaten werden ook uitgezet in de tijd. Aanpassingen aan de CDRs werden doorlopend doorgevoerd.

De werkwijze voor de afhandeling van meldingen werd geüniformiseerd met behulp van een handleiding en geëvalueerd via een kappa-test.

(VOORLOPIGE) RESULTATEN

In totaal werden tussen 12/11/2019 en 30/09/2020 9260 meldingen gegenereerd die leidden tot 782 adviezen. De acceptatiegraad bedroeg gemiddeld 73,03% en varieerde naargelang de rule tussen 68% en 80%.

De kalium-rule (2289) en de nierfunctie-rule (5631) leveren de meeste orders op, alsook de meeste adviezen (respectievelijk 385 en 271). De PPV voor de nierfunctie-rule was het laagst (gemiddeld 4,8%). Doorheen de tijd nam de PPV voor elke rule toe. De acceptatiegraad bleef constant.

DISCUSSIE EN CONCLUSIES

CDRs zijn een nuttige toevoeging aan de dagelijkse klinische validatie. De implementatie van vijf rules leidde tot een groot aantal adviezen in een periode van minder dan een jaar. Ongeveer driekwart van deze adviezen werd geaccepteerd. Redenen van non-acceptatie werden niet onderzocht, maar kunnen te maken hebben met de manier van terugkoppeling. Commercieel beschikbare CDRs zijn nuttig, maar optimalisaties zijn helaas beperkt mogelijk. Het is een uitdaging om met zelfontworpen rules een hogere PPV te bereiken en beter te voldoen aan de noden van de specifieke zorginstelling.

PP 6 |Concordance between guidelines on perioperative management of NOACs and its implementation and preventable causes of the occurence of ischemic stroke

Simons Sara[1], Vanacker Peter[2, 3, 4], Verhaeghe Anne[1], Verhelle Katy[1], Meeus Gert[5]

[1]Dept. Of Clinical Pharmacy, AZ Groeninge, Kortrijk, Belgium;
[2]Dept. Of Neurology, AZ Groeninge, Kortrijk, Belgium;
[3]Dept. Of Translational Neurosciences, Antwerp University, Belgium;
[4]Dept. Of Neurology, University Hospital Antwerp, Belgium;
[5]Dept. Of Nephrology, AZ Groeninge, Kortrijk, Belgium

BACKGROUND & AIM

The extent to which perioperative interruption of NOAC therapy are concordant with best evidence is uncertain. This study investigates whether a possibly inappropriate peri-operative advice can lead to the occurrence of an ischemic stroke. Further, we examined the relation to inappropriate dosing, peri-operative management and interactions.

METHODS

The following data from all ischemic stroke patients, prior treated with a NOAC, were retrospectively collected from the EVAS-BE-database from AZ Groeninge Kortrijk (01/2019-10/2019): date of stroke, etiology, previous stroke, posology & indication NOAC, renal function, weight, age, concomitant drugs, surgery, medication management post-stroke and discharge therapy. Concordance of perioperative anticoagulation management with regional and EHRA guidelines was rated by a clinical pharmacist according to explicit thrombosis and bleeding risk.

RESULTS

Of the 57 included patients with an ischemic stroke under NOAC, nine patients (16%) were planned to undergo surgery. The decision to interrupt anticoagulation was concordant with regional guidelines; compared to EHRA guidelines: three cases stopped without indication, three low and one high bleeding risk patient stopped too early.

First of all inappropriately dosing (30%) and posology (7%) based on the SmPC criteria was identified. Underdosing was mainly the driving factor (16 vs. 1). Secondly, 16 patients (28%) showed one or more interactions with concomitant drug. A higher thrombosis risk was seen in 2 patients (pharmacodynamic interaction). Four patients showed a

pharmacokinetic interaction; one of them was an decreased effect. Thirdly, greatest risk in the peri-operative phase seemed to be post-surgery (7) in comparison with pre-surgery (2). And finally, medication adherence could be questioned in 5 patients (9%).

CONCLUSION

Occurence of ischemic stroke in the peri-operative phase in patients treated with NOAC is a major problem. Main issue seems the discordance between our regional guideline and EHRA guideline. Other reasons for its occurence are inappropriate dosing, drug-interactions and non-compliance.

AUTHOR INDEX