EAHP Academy Seminars 2019

An ACPE application based activity

Antibiotic Stewardship: Advanced

About Antimicrobial Stewardship (ABS)

- Background: High costs of antimicrobial therapy, error prone therapy, development of resistance, no new drugs for new targets, necessary for guideline, multidisciplinary team approach;
- Existing guidelines on how to implement and run Antibiotic Stewardship programs;
- Already a topic on several EAHP congresses, high number of audience.

The Educational Need Addressed

As seen during workshops and seminars at last congresses topic is of interest for members but knowledge is different. A first Academy on ABS (ABS for Beginners) resulted in the wish of many participants to run another Academy with the same topic but for hospital pharmacists with an advanced level of knowledge in this field. The topics to be covered were named in the field of:

- Antimicrobial therapy in connection to lab results (MIC-based therapy)
- Antifungal therapy and the necessity to have TDM on board
- TDM driven antibiotic therapy: for whom and for what antibiotic?

Links to the EAHP mission & goals and to the European Statements of Hospital Pharmacy

Antibiotic Stewardship is at the interface of procurement, clinical pharmacy and patient safety. As such, it is addressed in the European Statements of Hospital Pharmacy.

According to statement 1.1, the hospital pharmacist contributes to optimise patient outcomes through working collaboratively within multidisciplinary teams. Statements 1.4 and 1.5 stipulate that the hospital pharmacist has overall responsibility for the safe, effective and optimal use of medicines, and is a supervisor in all steps of all medicine use processes.

In statement 2.2 this supervision is elevated to a leadership in developing, monitoring, reviewing and improving medicine use processes. According to statement 2.7, hospital pharmacists should be involved in the development of policies regarding the use of medicines brought into the hospital by patients.

In the clinical setting, statements 4.1 through 4.6 address the task of prospectively influencing collaborative, multidisciplinary therapeutic decision-making. Hospital pharmacists should play a full part in decision making including advising, implementing and monitoring medication changes in full partnership with patients, carers and other health care professionals. Review should take place prior to the supply and administration of medicines by having access to the patients? health record. Clinical interventions should be documented in the patients? health record and analysed to inform quality improvement interventions. Assessment of the appropriateness of all patients? medicines, including herbal and dietary supplements is also found among the duties of hospital pharmacy, as well as to supervise transfer of information about medicines whenever patients move between and within healthcare settings, to offer information about

clinical management options, and especially medicines, in terms they can understand.

In terms of patient safety and quality assurance, a wide area of tasks comprises supervision of the ?seven rights?, detection of errors and identification of priorities for improvement, reporting of adverse drug reactions and medication errors to regional or national pharmacovigilance programmes or patient safety programmes, disseminating evidence- based approaches to error reduction including computerised decision support, identification of high-risk medicines, elimination of transcription steps between the original prescription and the medicines administration record, assurance of accurate recording of all allergy and other relevant medicine-related information in the patient?s health record, access to the information needed for safe medicines use, according to statements 5.1 through 5.2 and 5.4 trough 5.9. Regarding especially the antibiotic therapy the pharmacist has to be a member of ABS-teams. The task of those teams and so also the task of hospital/clinical pharmacists is written down in existing guidelines like IDSA or others.

As a result, the hospital pharmacy contribution to Antibiotic Stewardship consists of:

- policy and procedure development;
- implementation and performance improvement;
- training and competency assurance;
- information systems development;
- advocacy.

In addition to the European Statements of Hospital Pharmacy, the need is also arising from hospital pharmacy practice, since the topic ?Antibiotic Stewardship? has been proposed in the Cyber Café Needs Assessment Survey at the EAHP Congress 2014 at Barcelona and from the EAHP Scientific Committee?s experience when evaluating submitted abstracts.

Assessment of Learning Success

To evaluate the learning success as requested by ACPE and as defined by teaching goals and learning objectives, a Survey Monkey® driven online questionnaire will be developed. This form can be completed online subsequent to the Academy Camp. The link will be communicated to the delegates. A participation certificate will be delivered by link after anonymous submission of the completed questionnaire.

Contents and Learning Objectives of the lectures

The Academy Seminar and Workshops show a main track from a general overview to national clinical implications. The main focus is put and centred on the patient and on processes.

To clarify terms and obtain a commonality of understanding, some definitions might be outlined as far as they are needed to exclude misunderstandings. However, a broad discussion and philosophy on the terms is excluded.

Therapeutic drug monitoring for all drugs and for all patients?

Dr Ute Blassmann[1], Heidelberg University Hospital, Germany

Linked to Hospital Pharmacy Statements

- Section 1: Introductory Statements and Governance (1.6, 1.7)
- Section 2: Selection, Procurement and Distribution (2.3)
- Section 4: Clinical Pharmacy Systems (4.1)
- Section 5: Patient Safety and Quality Assurance (5.2)

Abstract
Pharmacokinetic variability of anti-infective drugs due to pathophysiological changes is a well-known problem for critically ill patients resulting in suboptimal serum concentrations of these agents. Many licensed antimicrobial dosing regimens are derived from studies in healthy adults with normal physiology. But inter-patient variability in distribution and elimination of anti-infective drugs in critically ill patients is extremely high and also highly unpredictable and therefore risk factor for toxicity as well as insufficient concentrations. In addition, microbiological susceptibility testing doesn't take the pharmacokinetic variability into account. To assure a timely and adequate anti-infective regime individual dosing and therapeutic drug monitoring (TDM) seem to be appropriate tools in infection control.

Learning objectives
At the end of this session, participants will be able to:

- list the principles of antibiotic dosing;
- discuss the scenarios and patients to apply TDM;
- list Antibiotic drugs for TDM;
- discuss the Essentials of an TDM service.

Educational need addressed
During this seminar will be presented circumstances under what (agents, patients, clinical situation) therapeutic drug monitoring should be performed , how to interpret the measured concentrations and what are the TDM limitations.

Keywords: therapeutic drug monitoring, inter-patient variability, intra-patient variability, pharmacokinetic, individual dosing, toxicity, critically ill patients, obesity.

Do we need beta lactam therapeutic drug monitoring or can we just use prolonged infusions?

Dr Ute Blassmann [1], Heidelberg University Hospital, Germany

Linked to Hospital Pharmacy Statements

- Section 1: Introductory Statements and Governance (1.6, 1.7)
- Section 2: Selection, Procurement and Distribution (2.3)
- Section 4: Clinical Pharmacy Systems (4.1)
- Section 5: Patient Safety and Quality Assurance (5.2)

Abstract
Beta lactam antibiotics exhibit primary time-dependent antimicrobial activity. Therefore, prolonged infusion including continuous infusion can improve time over the minimum inhibitory concentration (MIC) and may attain target pharmacokinetic/pharmacodynamic exposures with similar or lower cumulative daily doses than those used for intermittent infusion. In turn, the ability to decrease overall direct consumption of antimicrobials has the potential to reduce antimicrobial-related adverse effects and costs. Individual dosing, prolonged infusion time and therapeutic drug monitoring (TDM) give way to new and promising opportunities in infection control. However, clinical experience with beta lactam TDM remains relatively scarce.

Learning objectives
At the end of this session, participants will be able to:

- discuss the options for dose optimization of beta lactams;
- list the toxicity of beta lactams;
- discuss the current status of beta-lactam TDM and prolonged infusions.

Educational need addressed
Beta-lactam antibiotics are the most commonly prescribed antibiotics and considered very safe drugs. There are a few clinical situations when ?product information? dosing of beta-lactams is not appropriate and results in underdosing of patients and increase in resistance. During the seminar we will discuss pros and cons of different approaches to dose optimisation of beta-lactams.

Keywords: beta-lactams, pharmacokinetic/pharmacodynamic exposure, dose optimisation, therapeutic drug monitoring, prolonged infusions.

Antifungal therapy: what comes out of the pipeline in the near future?

Prof William Hope [2], University of Liverpool, United Kingdom*

Linked to Hospital Pharmacy Statements

- Section 1: Introductory Statements and Governance (1.1, 1.3, 1.6)
- Section 4: Clinical Pharmacy Systems (4.1)
- Section 5: Patient Safety and Quality Assurance (5.1)

Abstract
Invasive fungal infections continue to appear in record numbers as the immunocompromised population of the world increases, owing partially to the increased number of HIV infected individuals, transplanted patients and partially to the ability to treat serious underlying diseases. The effectiveness of current antifungal therapies in the management of these infections has plateaued. The introduction of echinocandins has contributed to the improvements in outcomes related to invasive fungal infections. Optimization of formulations and pharmacokinetic or pharmacodynamics properties is also improving survival. Despite these advances, invasive fungal-related mortality remains high and resistance to existing agents is concerning. The identification of both novel agents and novel fungal targets is very important for a successful treatment of such fungal infections.

Learning objectives
At the end of session participants will be able to:

- describe the pathogens causing most invasive fungal infections;
- discuss the limits of ?old? antifungal therapy;
- define novel potential targets for antifungal drugs;
- list different categories of new antifungals which are being developed;
- discuss advantages of new antifungals.

Educational need addressed
Invasive fungal infections are important causes of morbidity and mortality especially in high risk patients. During this seminar we will discuss limitations of old antifungal therapy, define new potential targets for antifungal drugs and present pros and cons of novel antifungals.

Keywords: antifungals, resistance, pharmacokinetic/pharmacodynamic properties, new agents.

TDM and PK/PD in antifungal therapy: when and why?

*Prof William Hope** [2], *University of Liverpool, United Kingdom*

Linked to Hospital Pharmacy Statements

- Section 1: Introductory Statements and Governance (1.6, 1.7)
- Section 2: Selection, Procurement and Distribution (2.3)
- Section 4: Clinical Pharmacy Systems (4.1)
- Section 5: Patient Safety and Quality Assurance (5.2)

Abstract

Many antifungal drugs exhibit marked variability in drug blood concentrations due to inconsistent absorption, metabolism, elimination, or interaction with concomitant medications. An understanding of the pharmacokinetics (PK) and pharmacodynamics (PD) of these drugs is essential for optimization of drug choice and dosing regimen. Even if appropriate drug and regimen are initiated drug exposure at the site of infection may be inadequate due to PK variability and may contribute to treatment failure or toxicity. Therapeutic drug monitoring is a tool which helps to obtain the desired clinical effects of antifungals safely.

Learning objectives

At the end of session participants will be able to:

- define PK/PD principles of antifungal therapy;
- discuss scenarios when TDM of antifungals is essential;
- list the antifungals for TDM.

Educational need addressed

During this seminar we will discuss PK/PD principles of antifungal therapy and present TDM as a valuable adjunct to the antifungal therapy which can increase the probability of its successful outcome, prevent drug-related toxicity and potentially prevent the emergence of antifungal drug resistance.

Keywords: antifungal therapy, PK/PD principles, therapeutic drug monitoring, toxicity, optimization.

MIC-directed therapy: why, when and what are the pitfalls?

Dr Anouk Muller [3], HaaglandenMC, The Hague and ErasmusMC, Rotterdam

Linked to Hospital Pharmacy Statements

- Section 1: Introductory Statements and Governance (1.6, 1.7)
- Section 2: Selection, Procurement and Distribution (2.3)
- Section 4: Clinical Pharmacy Systems (4.1)
- Section 5: Patient Safety and Quality Assurance (5.2)

Abstract
The MIC is the measure of antimicrobial susceptibility of the pathogen to an antimicrobial agent. Because of that it seems quite logical that the MIC should be used in antimicrobial therapy in every case. But do we do so and even more: should we do so? Do clinicians always chose antimicrobial agents on the basis of MIC?s? And is the MIC a parameter we can always trust? And what about other measures e.g. bioavailability at the infection site? Are those measures of more importance than a MIC given by a single determination?

In this session the speaker will present examples on how to use MIC for the choice of the right antimicrobial agent in the right dose and what the MIC?s impact on outcome of therapy is. There will also be a critical discussion on the MIC itself with a focus on perhaps wrong use of MIC data regarding dose adjustments. He will also stress the susceptibility definitions (susceptible [S], intermediate [I], or resistant [R]) used and what the newest developments in the use of those definitions are.

Learning objectives
At the end of this session participants will be able to:

- list the different methods to measure the MIC;
- list the connection between MIC and therapy outcome;
- discuss how the knowledge on a certain MIC influences therapy decisions;
- discuss the importance of the MIC for effective dosing of antimicrobials.

Educational need addressed
Methods for antibiotic optimization include therapeutic drug monitoring, single MIC determinations plus pharmacokinetic/pharmacodynamics. MIC variation must be considered to prevent underdosing of patients. During this seminar we will present some approaches in MIC interpretation that could be used in clinical practice.

Keywords:antimicrobials, MIC determination, susceptibility, effective dosing.

The impact of PK/PD for clinical decisions

Dr Anouk Muller [3], HaaglandenMC, The Hague and ErasmusMC, Rotterdam

Linked to Hospital Pharmacy Statements

- Section 1: Introductory Statements and Governance (1.6, 1.7)
- Section 2: Selection, Procurement and Distribution (2.3)
- Section 4: Clinical Pharmacy Systems (4.1)
- Section 5: Patient Safety and Quality Assurance (5.2)

Abstract
It is well accepted that pharmacokinetics (PK) and pharmacodynamics (PD) are somehow related to each other. But in clinical practice we can see that this is often ignored and the impact of PK/PD on clinical decisions like individualisation of antimicrobial therapy is poor, unfortunately. The speaker in this session will explain why knowledge of PK/PD of antimicrobials in different patient groups is key to get a favourable outcome of antimicrobial therapy.

Learning objectves
At the end of this session participants will be able to:

- list the different PK/PD correlations in different patient populations, e.g. patients with sepsis;
- discuss how the knowledge on PK/PD should influence clinical decisions;
- discuss if PK/PD data should be ?used? in any patient or only in some patients.

Educational need addressed

During this seminar we will show that to achieve the best antibiotic efficacy we need to evaluate pharmacokinetic parameters, MIC and take into consideration the PD properties of the drug.

Keywords: PK/PD, individualisation, patient populations, critically ill patients.

What?s really new in ?antibiotic? therapy?

Prof Dr Martin J. Hug [4], Institute of Pharmaceutical Sciences, University of Freiburg, Germany

Linked to Hospital Pharmacy Statements

- Section 1: Introductory Statements and Governance (1.6, 1.7)
- Section 2: Selection, Procurement and Distribution (2.3)
- Section 4: Clinical Pharmacy Systems (4.1)
- Section 5: Patient Safety and Quality Assurance (5.2)

Abstract

Several programs have tried to motivate pharmaceutical industry to bring new antimicrobial drugs to the market. But it is not only about getting new drugs at all. It is also about to find new targets for antimicrobial therapy. And perhaps it is also more than new targets. It is perhaps also about new approaches like fecal transplantation or phage therapy. The speaker will list new antimicrobial agents that will have a high impact on therapy and will discuss how the new options might work in the future.

Learning objectives

At the end of this session participants will be able to:

- list new antimicrobial agents which are important for the treatment of serious ill patients;
- list new methods to treat infections;
- discuss the problems of authorisation for new options like phage therapy;
- discuss the evidence behind those new options like fecal transplantation or phage therapy.

Educational need addressed

During this seminar we will list new antimicrobial agents that will have a high impact on therapy and will discuss how the new options might work in the future.

Keywords: new drugs, development, new targets, phage therapy, fecal transplantation.

Antimicrobial prophylaxis in HSCT-patients: guidelines and evidence

Dr Philipp Wohlfarth[5], Medical University of Vienna, Austria

Linked to Hospital Pharmacy Statements

- Section 1: Introductory Statements and Governance (1.6, 1.7)
- Section 2: Selection, Procurement and Distribution (2.3)
- Section 4: Clinical Pharmacy Systems (4.1)
- Section 5: Patient Safety and Quality Assurance (5.2)

Abstract
Patients who will undergo a human-stem-cell-transplantation are at high risk to get an infection. Therefore it is a general strategy to treat the with an antimicrobial prophylaxis regime. Doing that the hope is that patients will not suffer from bacterial, fungal or viral infections. Several guidelines are in place in this field and will be presented by the speaker.

Learning objectives
At the end of this session, participants will be able to:

- discuss the different prophylactical regimes to prevent infections;
- discuss other measures to prevent infections in this patient population.

Educational need addressed
Infection in HSCT recipients is associated with high morbidity and mortality. During this seminar we will discuss general strategies to reduce the risk, different antimicrobial prophylactic regimes and other important strategies that should be employed to reduce the risk of infections in HSCT recipients.

Keywords: HSCT, timeline of infections, prophylactic regime, pre-emptive therapy, hygiene measures.

Hygiene measures, isolation and therapy

Prof Dr Annette Schuermans [6], University Hospitals Leuven, Belgium

Linked to Hospital Pharmacy Statements

- Section 1: Introductory Statements and Governance (1.1, 1.4, 1.5)
- Section 4: Clinical Pharmacy Systems (4.1)
- Section 5: Patient Safety and Quality Assurance (5.1)

Abstract
Patients frequently develop nosocomial infections that are caused by normal flora colonizing the patient at the time of admission, or by exogenous pathogens that are acquired and subsequently colonize the patient after admission to the hospital. To prevent nosocomial infections, a variety of approaches may be used either to prevent colonization from occurring or to eradicate colonization once it has occurred. These strategies include implementation of infection control measures, suppression of normal flora, eradicating carriage of exogenous pathogens, immunization of high-risk patients, antimicrobial prophylaxis and microbial interference therapy.

Learning objectives:
At the end of the session participants will be able to:

- identify risk factors of patients for a colonization by nosocomial pathogens;
- discuss the right strategy for eradication of colonizing organisms for different patients;
- define pros and cons of different eradication approaches.

Educational need addressed
During this seminar we will define the risk factors of patients for a colonisation by nosocomial pathogens, present different strategies for prevention of hospital acquired infections and discuss the advantages and disadvantages of these different approaches.

Keywords: nosocomial infections, colonization, eradication, isolation, hygiene.

Contents and Learning Objectives of the workshops

Prof Dr Isabel Spriet[7], UZ Leuven, Belgium
Dr Peter Declercq[8], University Hospitals Leuven, Belgium
Prof William Hope [2], University of Liverpool, United Kingdom*
Tine Van Nieuwenhuyse [9], UZ Leuven, Belgium

Interactive parts

- Antimicrobial dosing: one size fits all? Clinical case discussion
- Back-office clinical pharmacy services: a contribution to antimicrobial stewardship
- Antifungal case discussion

Linked to Hospital Pharmacy Statements

- Section 1: Introductory Statements and Governance (1.6, 1.7)
- Section 2: Selection, Procurement and Distribution (2.3)
- Section 4: Clinical pharmacy Services (4.1)
- Section 5: Patient Safety and Quality Assurance (5.2)

Abstract

During the three interactive workshops participants will be involved in decision making around antibiotic and antifungal therapy.

In thefirst workshop current challenges in antimicrobial dosing will be discussed. Participants will learn which patient-, pathogen- and product-related characteristics should be taken into account in antimicrobial dose selection. Requirements for and pros vs. cons of TDM and prolonged/continuous infusion will be discussed.

In thesecond workshop the integration of clinical rules promoting antimicrobial stewardship in electronic prescribing and the patient?s medical record will be discussed by a step-by-step approach. Participants will be asked to give their opinion (by voting) on several methodological and pharmacotherapeutic issues.

In thethird workshop, current challenges in antifungal pharmacotherapy will be discussed by presenting several real-life clinical cases. Difficulties in dose selection due to e.g. drug-drug interactions, potential side effects and the role of antifungal TDM will be assessed.

Learning objectives:

At the end of this sessions, participants will be able to:

- understand the key-elements that should be taken into account when deciding about antibiotic dosing;
- explore the different ways in which antimicrobial stewardship might be organized by backoffice clinical pharmacy services;
- discuss the difference between local and global guidelines;
- encourage discussion among workshop participants on choosing appropriate antibiotic dosing;
- gain different perspectives on managing cases that they may encounter in practice;
- discuss challenging cases in antifungal management.

Educational need addressed

During the three workshops we will show via different case studies how to optimize anti-infective dosing in different clinical situations and how integration of clinical decision support system can improve antimicrobial prescribing in inpatient hospital setting.

Keywords:optimization of dosing, PK/PD characteristic, therapeutic drug monitoring, clinical decision support system, guidelines.

Last update: 26 August 2019

Links

[1] http://www.eahp.eu/content/dr-ute-blassmann
[2] http://www.eahp.eu/content/prof-william-hope
[3] https://www.eahp.eu/content/dr-anouk-muller
[4] http://www.eahp.eu/content/prof-dr-martin-j-hug-0
[5] http://www.eahp.eu/content/dr-philipp-wohlfarth
[6] http://www.eahp.eu/content/prof-dr-annette-schuermans
[7] http://www.eahp.eu/content/prof-dr-isabel-spriet
[8] http://www.eahp.eu/content/dr-peter-declercq
[9] http://www.eahp.eu/content/tine-van-nieuwenhuyse-0