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Abstracts



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ABSTRACTS

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Oral Presentations

O1 World tour of ritualistic, wasteful and unsafe IPC practices

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Although the real global burden of healthcare-associated infections (HAIs) is unknown because of the difficulty in gathering reliable data, it has been estimated that, at any time, over 1.4 million patients worldwide are suffering from infections acquired in healthcare facilities. HAIs affect all countries, irrespective of their level of development, and can affect patients, healthcare workers and visitors. It has been estimated that the incidence of HAIs in the developed world is between 5–10%, while in low- and middle-income countries the risk of HAIs is 2–20 times higher and the proportion of patients affected by HAIs can exceed 25% in developing countries.

Despite recent advances and publications of evidence based papers in HAIs, most healthcare facilities worldwide fail to implement even basic evidence based IPC practices effectively and waste lot of resources in implementing practices which are not only ineffective but ritualistic and wasteful. This presentation will take you through a photographic journey of healthcare facilities worldwide to highlight the ritualistic, wasteful and unsafe IPC practices which are currently observed and discuss that HAIs can be reduced by abandoning the ritualistic and wasteful practices and diverting resources to implement evidence based practices to reduce HAI. The presentation will also give examples that the implementation of no/low cost and cost effective IPC interventions are very effective in reducing HAIs.

O2 Healthcare associated infections: a quality indicator for hospitals

Jacqui Reilly

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Healthcare associated infections are adverse events, a measure of patient safety and considered a quality indicator for hospitals therein. Quality indicators in healthcare show how an organisation is progressing in terms of its aims. In some countries targets have also been used to express organisational priorities. Together, targets and indicators let users of healthcare systems know what to expect of the organisation. Healthcare is however part of a complex system and these indicators need to be: relevant, defined, consistently measured and focussed on prevention potential, as part of the healthcare system, if they are to deliver better outcomes for patients. Experience with existing targets and indicators in HAI, in some countries, has been positive in many respects. Significant improvements in HAI have been achieved.

However, the risk of 'hitting the target and missing the point' is ever present and there remains considerable debate about which HAI related indicators are the most appropriate. Studies on the impact of indicators describe two main issues, firstly improvements in processes which are measured and focussed upon, and secondly unintended consequences. Thus before effective targets and indicators can be set, it is necessary to be clear about the overall objectives of this complex system, the methods by which those objectives will be delivered and the information that can be used to measure progress towards those objectives if we are to optimise their use in IPC.

O3 Pro-con debate: Multidrug-resistant organisms can be effectively controlled in healthcare settings without a screening programme

For the motion: David Jenkins

*University Hospitals of Leicester NHS Trust,
United Kingdom*

Against the motion: Fidelma Fitzpatrick

*Royal College of Surgeons in Ireland and Beaumont
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Control of multidrug-resistant organisms (MDROs) continues to pose a major challenge to infection prevention and control (IPC) professionals, especially with the increasing incidence of resistant Gram-negative infections (including Carbapenem-resistant Enterobacteriaceae). Screening is often cited as a key intervention in IPC programmes to control these MDROs. However screening comes at a significant cost both in terms of laboratory requirements as well as human and hospital resources. Can we therefore achieve effective MDRO without a comprehensive screening programme? Two experts will debate this topic from divergent points of view.

O4 Naughty CAUTI – why is prevention still a challenge?

Martin Kiernan

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Many device-associated healthcare-related infections have now a solid evidence base on which to base best prevention practice, however is this true for infections related to urinary catheters? Catheter-associated urinary tract infections (CAUTI) continue to figure as a significant proportion of HCAI in prevalence studies and these are both costly in terms of financial resources and clinical impact from morbidity. This paper will review the most recent evidence for long and short-term CAUTI prevention and will highlight interventions that have demonstrable effectiveness both from clinical practice and technology

perspectives as biofilms in catheters are significant when examining the aetiology of CAUTI. Reducing inappropriate catheterisation is at the forefront of CAUTI reduction strategies and the latest evidence for this will be examined, particularly from evidence relating to any requirement for catheterisation during surgical procedures, where custom and culture may dominate clinical practice.

Right line, right patient, right time – improving vascular access

O5

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Vascular access along with the administration of intravenous drugs and fluids is common practice in healthcare today and plays an important part in the care and management of many patients. Although vascular access can be life saving for some patients it can also result in a range of both minor and life-threatening complications including phlebitis, thrombus, infection and damage to the vessel. Vascular access is often delegated to junior staff with little or no assessment for the choice of device. It is commonplace to default to the peripheral venous cannula that may not be the best device for some patients resulting in the device failing before the intended duration of treatment. The implications for patients of failed cannulation include pain and delayed IV fluids, antibiotics and analgesia resulting in increased length of hospital stay.

Previous work published by Moureau *et al.* (2012) inspired a working group led by the Infection Prevention Society to produce a vessel health and preservation (VHP) framework. This was with the intention of producing a resource for frontline staff to be able to assess and select the best vascular access device to meet the individual patient's needs, reduced delayed treatment and to preserve veins for future use.

This presentation describes how the framework was developed using available evidence, expert opinion

and some small scale testing of the components of the framework. Further work is required to formally evaluate the VHP framework in clinical practice to measure both staff knowledge and patient outcomes.

O6 Ventilator-associated pneumonia

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Ventilator-associated pneumonia (VAP) is among the most serious of all healthcare-associated infections, with crude mortality estimates ranging from 15% to 70%. VAP is also associated with increased length of stay (both Intensive Care Unit and Hospital) and added costs. Changes in surveillance and prevention approaches to incorporate the broader concept of "Ventilator Associated Events" (VAE) have provoked debate in the literature and anecdotally, surveillance for VAP/VAE is not always perceived by clinicians as valuable or a true indicator of disease. VAP and VAE "bundles" have been commonplace for a number of years with reported success but again are not without controversy. This presentation will review the epidemiology of and surveillance for VAP/VAE, including estimates of morbidity and mortality and will discuss the elements of VAP/VAE "bundles" and their associated evidence base. Finally more speculative interventions will be explored, such as modified endotracheal tubes and probiotics.

O7 A path to least resistance: a study of nurse antibiotic prescribing behaviour

Valerie Ness, Lesley Price, Jacqui Reilly, Kay Currie

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Introduction/aims

Inappropriate prescribing is a contributing factor to antimicrobial resistance. Nurses across the

world, through additional training and/or specific guidance or governance, can independently prescribe antimicrobials; however, very little is known about their prescribing behaviour. This study aimed to explore the appropriateness of nurses' antimicrobial prescribing behaviour and the influences on this behaviour.

Methods

This was a three stage, mixed methods study, using a behavioural model - The Reasoned Action Approach (RAA).

- **Stage 1:** an analysis of prescribing data to describe current nurse antimicrobial prescribing practice,
- **Stage 2:** telephone interviews with 27 nurse prescribers,
- **Stage 3:** development of an online questionnaire using the findings from Stage 2 was completed by 184 nurse prescribers. Descriptive and inferential statistical analysis, including correlation and regression analysis, was carried out to establish the key determinants of their behaviour.

Results

Results from both the prescribing data and the survey found that nurse prescribers adhere to antimicrobial prescribing guidelines. Key significant influences facilitating this behaviour were, social influence from other nonmedical prescribers (NMP) ($\beta=0.042$; $p=0.007$) and other nurse prescribers ($\beta=0.036$; $p=0.045$), along with experience and confidence ($\beta=0.044$; $p=0.001$); whilst pressure from patients/carers to prescribe an antibiotic was a barrier ($\beta=0.026$; $p=0.031$).

Conclusion

Nurse prescribing of antibiotics is increasing and these results suggest this cohort prescribe appropriately. To promote this behaviour in other nurse prescribers, interventions should focus on, reducing the influence of patient pressure, using the positive influence of other NMPs, or changing nurse prescribers' beliefs about their capability to manage these patients.

O8 **Balancing the risks to individual and society: a systematic review of qualitative research on antibiotic prescribing in secondary care**

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University of Leicester, United Kingdom

Introduction/aims

Over-prescription of broad-spectrum antibiotics in secondary care remains a global driver of antibiotic resistance. Qualitative research can help identify risks and benefits associated with decisions about antibiotic use, contributing to more targeted interventions.

Methods

A systematic literature search of qualitative research on antibiotic prescribing in secondary care was conducted. Using a framework synthesis approach informed by the Health Belief Model, two risks involved in antibiotic prescribing decisions were examined: individual patient morbidity and society's antimicrobial resistance risk.

Results

Physicians across all studies stated the salience of individual patient risks for their daily prescribing choices. Broad-spectrum antibiotics were perceived as effective treatment with few side effects. Their use was seen as giving best protection from immediate risks of negative patient outcomes and risks to professional reputation. BSAs were seen as best response to patient demand, time and resource constraints. The risk of antimicrobial resistance was recognised, but the abstract and long-term nature of its consequences led physicians to discount personal risk susceptibility. Prescribing narrow-spectrum antibiotics was considered to confer limited benefit in the fight against a problem as complex as antimicrobial resistance. Specific barriers to optimising prescribing included poor microbiology services and risks of damaging professional relationships.

Conclusion

To optimise antibiotic use, research needs to raise awareness about immediate risks associated with

antimicrobial resistance, provide quantifiable evidence of the effectiveness of stewardship activities, and identify successful rewards for engaging in these. Cross-national studies comparing private and public hospitals may improve understanding of prescribing differences between countries of varying development levels.

Effectiveness of a hospital wide antimicrobial stewardship programme

O9

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Introduction

Multidrug resistant organisms (MDRO'S) spread is a major public health worldwide.

Aim

To evaluate the effectiveness of a hospital antimicrobial stewardship programme (ASP) on both antibiotics use and hospital circulation of MDRO's.

Methods

Since February 2016 antibiotic restriction with prior authorization by an antibiotic expert was introduced for carbapenems and teicoplanine, together with selective reporting of antimicrobial susceptibilities. Antibiotic use was measured by daily defined doses (DDD) and MDRO's circulation by hospital incidence of newly diagnoses case, both colonized and infected.

Results

A before-after analysis was done, comparing January 2014-2016 versus February 2016-October 2017. Meropenem use decreased by 39%, ertapenem by 57.4%, teicoplanin by 60.3% (all: p<0.001). Use of antibiotic already restricted before 2016 also decreased, even if to a lesser extent: tigecycline by 19.1%, linezolid 41%, colistine 25% (all; p<0.001), vancomycin 5.5%. Overall, use of all other antibiotics decreased by 3.4% in the study period.

Finally, in the before-after analysis incidence of patients colonized/infected by carbapenem resistant enterobacteria decreased by 30.4%, while MRSA incidence was stable.

Conclusions

Our ASP showed to be effective in reducing use of target antimicrobials and, possibly, in lowering hospital circulation of selected MDRO's; furthermore, selective reporting of antimicrobial susceptibilities likely lead to increased appropriateness in the use of most antibiotics. Our ASP, albeit limiting, was well accepted by clinicians due to their direct engagement in the project.

O10 An effective strategy for auditing hospital mattresses at Mater Dei Hospital, Malta

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Michael A. Borg

Mater Dei Hospital, Msida, Malta

Introduction

Hospital mattresses are known to have the second highest patient contact after bed rails.¹

Background

In September 2017 a patient was admitted to a ward in our hospital. When she lay on the mattress, blood stained liquid started to seep out of the mattress resulting in soiling of the patient skin.

Management of the incident:

After this incident all mattresses in the hospital were checked for any leakage and those who were found not suitable were replaced with new ones. An SOP was drafted to verify effective inspection and disinfection after each patient discharge. Regular audits of all mattresses was also introduced. These interventions will be described in the presentation.

Conclusions

From January 2011 to January 2013, the FDA received 458 reports associated with medical bed mattress covers failing to prevent blood and body

fluids from leaking into the mattress.² It is essential that hospitals have policies in place to prevent such incidents.

References

1. Huslage K, Rutala WA, Sickbert-Bennett E, Weber DJ. A quantitative approach to defining "high-touch" surfaces in hospitals. *Infect Control Hosp Epidemiol* 2010; **31(8)**: 850-853.
2. FDA. April 19, 2013. Damaged or worn covers for medical bed mattresses pose risk of contamination and patient infection: FDA safety communication. <http://www.fda.gov/MedicalDevices/Safety/AlertsandNotices/ucm348016.htm>

The potential of Internet-of-Things for patient safety in infection control: using indoor-location systems to improve nurses' hand hygiene performance

O11

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Hospital-acquired-infections are a major patient safety problem. Their occurrence can lead to higher morbidity and mortality rates, increased length-of-stay, and higher costs for both hospital and patients. Performing hand hygiene (HH) is a simple and inexpensive prevention measure, but healthcare workers' compliance is often far from ideal.

To raise awareness regarding HH compliance, individual behaviour change and performance optimization, an Internet-of-Things (IoT) solution was implemented to collect data and provide real-time feedback accurately in an engaging way.

A Design Science Research Methodology was used to design, implement and evaluate the solution. Two work-iterations were performed applying gamification components, each using a different indoor-location technology. Preliminary experiments, simulations and field studies were

performed in an intensive care unit (ICU) of a Portuguese tertiary hospital. Nurses working on this ICU were engaged during, participating in several sessions during implementation.

Nurses enjoyed the concept and considered that it allows for a unique opportunity to receive feedback regarding their performance. Tests-performed on the indoor-location technology applied in the first-iteration regarding distances estimation presented an unacceptable lack of accuracy. Using a proximity-based technique, it was possible to identify the sequence of positions but with low precision. In the second work-iteration, a different indoor-location technology was explored with success, showing the importance of IoT technology to respond to the ward demands.

Combining automated-monitoring systems with gamification seems to be an innovative approach, based on the already achieved results. Involving nurses in the project since the beginning allowed to align the solution with their needs.

O12 **Man-machine dialog: how to optimize results of intelligent IT tools in infection surveillance and in clinical decision support**

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Introduction

In clinical IT solutions, use of coded data and involvement of clinical experts in the design are

important, but insufficient prerequisites for full clinical acceptance, even if all inference steps can be tracked. Hence, human experts should also be involved during execution of such IT solutions, thus promoting a less automated, more interactive program design.

Aims

We report on our interactive approach to solving ambiguity and identification problems. As an example, we chose unidentified terms used by clinicians and by the microbiology lab in their daily routine, which caused reports not showing up in automated follow-up analyses.

Method

For data import and analysis, we used MOMO, a comprehensive tool for analysing and monitoring microbiology lab reports, which automatically checks incoming textual identifiers (e.g., microbes, senders, antibiotics) for compatibility with existing thesaurus entries. Reports flagged by MOMO because they contained incompatible texts were automatically submitted to verification by a human expert. This expert determined to which (if any) thesaurus element the so far unknown item belongs, or if it demands a new code entry. Consequentially, the thesaurus was “trained” to recognise synonyms, syntactic deviations and misspellings, and codes were consolidated by process-inherent human intervention.

Results

The implementation of this man-machine terminology interface reduced dropouts to zero with only 2h/week work input.

Conclusion

In our opinion, clinical IT solutions must focus on good balance between full automation and man-machine interactivity for successful clinician-lab dialogue, which in turn supports patient care and infection control.

O13 Characterizing hand hygiene opportunities in the neonatal intensive care unit

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Eslyn Thomas, Nely Amaral, Allison McGeer**
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Introduction

Hand hygiene adherence measurement can be done through direct observations or e-monitoring systems. Group e-monitoring (GEM) systems require knowing the expected rate of hand hygiene opportunities (HHOs) per patient care hour.

Objectives

We aimed to characterize the type and frequency of HHO's in the neonatal intensive care unit.

Methods

One hour patient based observations were conducted in the neonatal intensive care unit (NICU) May – June 2017. The numbers of HHOs were recorded as defined by the “four moments for hand hygiene.” Rates of HHO per patient-hour were calculated, examining variation by moment, healthcare worker, acuity of neonates and time of day.

Results

In 122 hours of observations, 1040 HHO were observed. Moment 1 and 4 (before/after contact with patient/environment) comprised 86% of HHOs; moments 2 and 3 accounted for 8% and 6%, respectively. 78% of the HHOs involved nurses, 15% parents, 3% respiratory therapists, 2% physicians, 2% others. HHOs were more frequent during the day: 9.2/pt-hr (95%CI: 7.6-10.8) from 08:00-20:00 compared to 6.1/pt-hr (95%CI: 4.5-7.7) from 20:00-08:00 (P=0.05) HHO/pt-hr for neonates requiring mechanical ventilation or NIPPV was 16.8 (95% CI 8.7-21); compared to 7.9 (95% CI 6.6-9.1) for neonates requiring CPAP, and 7.6 (95% CI 6.1-9.1) for neonates not requiring ventilatory support (P=0.01).

Conclusion

The overall rate of HHOs in our NICU is 7.7/pt-hr. Ventilatory requirements are the most important factor influencing this rate. These data will be used to enable estimates of hand hygiene adherence using our GEM system.

O14 Education and training as a vehicle for change in infection prevention and control

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Kay Currie

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Effective delivery of training material is a critical component in ensuring you have impact in changing behaviour. Those required to deliver training in IPC should be familiar with approaches to teaching and learning with small and large groups, facilitating group work and discussion and how to get the most out of learners. This interactive workshop will overview: the evidence for the role of training and education in changing behaviour, basic androgogy for IPC professionals involved in training, approaches to training and hints and tips for success and the importance of evaluation.

O15 Prospective assessment of hospital acquired infections epidemiology in a haematology department

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Mohamed Mahjoub¹, Wadiaa Bannour¹, Bechir Achour², Abderrahim Khelif², Mansour Njah¹**

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Introduction

In haematology/oncology, intensified procedures have been associated with higher risk of healthcare associated infections (HAIs). This study aimed to estimate the burden of HAIs in an onco-haematology unit in a Tunisian university hospital.

Materials and methods

A prospective study, conducted during 6 months from March through September 2016 in the department of onco-haematology in a university hospital in Tunisia. Patients, admitted for ≥ 48 h, were followed until hospital discharge. The (CDC) criteria for site-specific infections were used to define HAIs.

Results

A total of 150 patients were included in the study with mean age; 23.12 ± 18.36 years. The incidence density of HAIs was 15.73 per 1000 patient-days. Mortality rate was 9.3% (n= 14), and 50% of cases of death were caused by HAIs.

The most frequent episodes of infection were: infection of skin and superficial mucosa (5.3%), pulmonary aspergillosis (4.6%), healthcare associated pneumonia (HAP) (4%), central venous catheter associated infection (4%), digestive infection (5%) and primary bloodstream infection (2.6%). Finally, fever of unknown origin (FUO) incidence rate was 14%.

In case of skin and superficial infection, implicated organisms were *Escherichia coli*, *Geotricum capitatum* and *Proteus mirabilis*. For pulmonary aspergillosis, only one case was proved by positive aspergillus antigen in bronchial aspiration. Considering primary bloodstream infection, implicated germs were *Enterobacter cloacae*, *Geotricum capitatum*, *Klebsiella pneumoniae* and *Streptococcus pneumoniae*.

Conclusion

This study showed the high incidence of HAI in the hematology unit and the need to implement strategies to reduce the HAI's rate and associated morbidity and mortality.

Patients' claims of hospital-acquired infection based on personal experiences

O16

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The use of new, innovative technologies as well as the development in medicine has contributed to a higher risk of causing damages, which were not apparent until now. The increase in the number of claims from patients and their families for so called medical errors becomes more important and it is due to the implementation of numerous legal solutions in this area. Moreover, courts alone are more inclined to grant the patients higher compensations in comparison to the rulings from several years ago. The victims of hospital-acquired infections are in much more difficult situation than other people demanding compensation or redress. In their cases finding the culprit is exceptionally hard. Most frequently, claims are made on account of being infected with Hepatitis B, Hepatitis C, *Streptococcus* spp. and *Staphylococcus* spp.

The following article is an example of an initial analysis of claims connected with hospital-acquired infections. The claims, identified on the basis of the authors' personal experience, are made by patients towards public hospitals.

The conclusion from the examples presented in this dissertation may serve as an aid in creating certain generalizations in patient's claims towards healthcare entities in Poland.

O17 **The perceptions of nurses in charge of wards about their role in improving hand hygiene compliance in their unit**

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Although hand hygiene (HH) is essential in preventing healthcare associated infections, improving compliance rates remain a challenge. We wanted to assess perceptions of ownership and accountability among nurses in charge of wards (CN) within our 1000 bed acute hospital.

Semi-structured questionnaires were distributed to all CNs at Mater Dei Hospital with a response rate of 87% (n=39). More than 95% of CNs agreed that it is their responsibility to ensure that handrub (AHR) is available near every bed and that nurses and carers under their responsibility perform the correct HH technique. Reminding and ensuring that nurses and carers perform HR before patient contact was also acknowledged as the CNs' job. However 35% of CNs did not believe that reminding allied health and doctors to perform HH was their responsibility. 84% agreed that it is their responsibility to carry out additional HH audits on nurses and carers in their ward but only 43.6% on doctors and allied health professionals (AHPs). 71.4% of CNs stated that they introduced initiatives among nurses and carers such as ensuring HR availability and regularly reminding staff during hand over and meetings. However only 26.3% reported any initiatives among doctors and AHPs as it is "not my job". HH audits were ranked as the most important initiative in improving HH in wards followed by HH promotional visits in the wards and feedback of HH rates.

These results correlate with anecdotal feedback and are possibly culturally related. They illustrate the challenges in extrapolating practices from more adhocratic countries.

Hand rubbing for 30 seconds is unrealistic goal for healthcare workers

O18

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Introduction

WHO has recommend hand disinfection time from 20 seconds (s) to 30 s.¹ However, it has been shown that hand rubbing time of 15 s in reducing bacterial counts on hands was not shown to be inferior to 30 s.²

Aims

To evaluate the duration of hand disinfection time in WHO's five moments¹ among healthcare workers during five years.

Methods

Between 2013 and 2017, infection control link nurses have observed hand disinfection among healthcare workers in Oulu University Hospital. The duration of successful hand disinfection time was evaluated afterwards in three time points: 15 s, 20 s and 30 s.

Results

There were 8233 hand disinfection findings from doctors and 33487 from nurses. Successful hand rub time in three time points (15 s, 20 s and 30 s) for doctors was 44%, 33% and 17% and for nurses 77%, 64% and 36%. Hand rub was not used in 36% by doctors and in 11% by nurses.

Conclusions

Basing on the experience of five year observation period in university hospital hand rubbing for 30 s is unrealistic goal for healthcare workers, especially for doctors but even for nurses. More realistic would be the duration of 15 s.

References

1. WHO 2009
2. Pires D, Soule H, Bellissimo-Rodrigues F, Gayet-Ageron A, Pittet D. Hand hygiene with alcohol-based hand rub: how long is long enough? *Infection Control & Hospital Epidemiology* 2017; **38**: 547-552.

O19 Ventilator-associated pneumonia, multidisciplinary and multifactorial interventions aiming “0”

Silvia Margalejo Raffin, Sebastian Nuñez, Silvia Paz, Claudia Diaz, Javier Reyes, Vivian Boyardi Cevora, Carlos Agüero, Mauro Castro, Rocio Altamirano, Paola Yanson, Gustavo Ramos

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Introduction

In July 2012, where we observed a rate of 21.60‰ ventilator-associated pneumonia (VAP). We implemented measures to improve rates but after the implementation, VAP rate decreased to 16‰, although it was still high.

Objective

Reduce the VAP rate in the intensive care unit (ICU), implementing a package of multifactorial measures to achieve a “0” rate.

Materials and methods

Prospective, interventional study in a polyvalent ICU. We use old NHSN definition of VAP according our national surveillance system (VIHDA).

In Nov 2015, we observed that the average onset of the VAP cases had changed from 18th to the 4th day from intubation, so the intervention was focused even more on this procedure. In addition, meetings of the infection control committee (ICC) were held, involving the entire ICU team in this objective. In the month of Dec/15, the ICC meeting resolved to carry out the intervention, implementing all the measures simultaneously.

These measures were:

1. Intubation checklist, oral hygiene with 0.2% aqueous chlorhexidine before intubation, hand washing, use of sterile field, maintain aseptic technique,
2. Perform oral hygiene of non-intubated patients with risk of respiratory complications,
3. Purchase of endotracheal balloon pressure gauge for each patient ventilated,

4. Readjustment of sedation protocol,
5. Keep doing the checklist for maintenances of patients in mechanical ventilation,
6. Use of endotracheal tubes with subglottic suctioning.

Results

The post-intervention rate after one year was 6.3‰, 5 episodes were observed versus 19 in 2015, utilization rate decreased 789 vs. 1154 ventilator-days. Current rate (Jan16/Jun17) is 5.82‰, 1375 ventilator- days, 8 episodes observed, SIR 0.342, 6888 patient-days. The 3 episodes occurred in the first semester of 2017, were patients over 70 years, with more than 4 comorbidities, one intubated in emergency in another institution and two patients were admitted with a diagnosis of pneumonia, one of them due to Influenza type A H1N1. None had another episode of HAI. The average onset of the episodes observed were 14 days from intubation. The use of endotracheal tube with subglottic aspiration was not implemented.

Conclusions

The intervention was effective, the rate decreased significantly, although the “0” was not reached. The cases that occurred in the semester of 2017 concurred also with a decrease in the nurse / patient relationship and an increase in the extra hours of the same due to unforeseen absences. It is important to emphasize that the institutional commitment and the multidisciplinary work guided by the infection control (IC) measures in our institution made the intervention effective, but it should also be noted that an improvement in the sedation protocol that is not directly related to the IC, decreased time of intubation and mechanical ventilation further reducing the VAP rate.

Use of reporting guidelines to design, report and referee antibiotic stewardship studies

O20

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Now that most infection control journals expect submissions to adhere to reporting guidelines, this

workshop will help you, whatever your level of experience, trainee or Nobel Prize winner, understand their role in enhancing quality and transparency of research. You will get a chance, in a highly interactive group setting to try one of them (ORION) out to review an antibiotic stewardship study.

Learning outcomes

1. Learn which guidelines relevant to antibiotic stewardship are now endorsed by IPC journals
2. Learn how to use one of them (ORION) to review antibiotic stewardship studies

O21 HIS Working Party guidance on multi-resistant Gram-negative infections

Peter Wilson

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Multidrug-resistant (MDR) Gram-negative bacterial infections have become prevalent in some European countries. Moreover, increased use of broad-spectrum agents selects organisms with resistance and, by increasing their numbers, also increases their chance of spread. The Joint Working Party Report described measures that are clinically effective for preventing transmission when used by healthcare workers in acute and primary healthcare premises. Methods for systematic review from 1946 were in accordance with SIGN 50 and the Cochrane Collaboration; critical appraisal was applied using AGREEII. Accepted guidelines were used as part of the evidence base and to support expert consensus. Recommendations were made in the following areas: screening, diagnosis, and infection control precautions including hand hygiene, single room accommodation, and environmental screening and cleaning. Recommendations for specific organisms were given where there are species differences. A second major publication this year has reviewed antibiotic treatment and stewardship. There were very few good-quality randomised controlled trials to support treatment regimens. Antimicrobial stewardship and improved surveillance are essential.

O22 Managing outbreaks of multi-resistant Gram-negative infections

Martin Kiernan

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The resurgence of gram-negatives as significant pathogens for healthcare-associated infections is a significant concern given the rapidly increasing resistance of this group to many antibiotics. Outbreaks are common and can be difficult to detect, especially if plasmid-mediated. Many countries have now introduced guidelines for the management of multi-resistant Gram-negatives, yet outbreaks still occur as many guidelines may be difficult to implement in practice, necessitating continual risk assessment by infection prevention specialists. This paper will review the measures that may be considered when attempting to prevent and control outbreaks and will consider the role of screening, isolation and patient and environmental decontamination. The formation of environmental biofilms by gram-negatives increases the challenge and the reasons for this will be explored and effective strategies suggested.

O23 Treatment of multi-resistant Gram-negative infections

Peter Hawkey

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University of Birmingham, United Kingdom*

The presentation will summarize the recommendations of the BSAC/HIS/BIA joint Working Party for antimicrobial prescribing for the treatment of infections caused by MDR GNB. More than 100 tabulated recommendations are made with suggestions for ad further research, and algorithms for hospital and community antimicrobial usage in urinary infection. The international definition of multi-drug resistance is complex, unsatisfactory and hinders the setting and monitoring of improvement programmes. A new definition of multi-resistance is given. The background information on the

mechanisms, global spread, and the UK prevalence of antibiotic prescribing and resistance has been systematically reviewed. The treatment options available in hospitals using intravenous antibiotics and in primary care using oral agents have been reviewed, ending with a consideration of antibiotic stewardship and recommendations given. The guidance includes recommendations for stakeholders, including prescribers, and antibiotic-specific recommendations. The clinical efficacy of different agents is critically reviewed although very few good quality comparative randomized clinical trials to support treatment regimens, particularly for licensed older agents. The guidance was derived from current peer-reviewed publications and expert opinion with open consultation. Methods for systematic review were NICE compliant and in accordance with the SIGN 50 Handbook; critical appraisal was applied using AGREE II. Published guidelines were used as part of the evidence base and to support expert consensus. The guidance should be used to improve outcome of infections with such strains. Anticipated users include medical, scientific, nursing, antimicrobial pharmacy and paramedical staff where they can be adapted for local use.

O24 Surveillance - using data for impact on patient care

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Surveillance for healthcare-associated infections (HAI) remains a challenge for infection prevention and control professionals (IPs) in healthcare settings around the world. Outcome surveillance requires use of definitions, calculation of infection rates, and reporting rates for the most impact in patient improvement activities. The use of process surveillance, or auditing, also plays a pivotal role in efforts to reduce infection risk, particularly when paired with meaningful outcome measures. IPs use surveillance to identify high risk patients, engage

stakeholders and inspire clinicians to implement measures that improve patient care. Well-planned and executed surveillance provides a powerful basis for improving patient care across patient populations and settings. In this session we will highlight how surveillance used in Winnipeg, Manitoba, Canada improved patient outcomes and review different types of surveillance and their uses. Additionally, participants will be asked to suggest surveillance challenges for discussion so practical solutions can be identified.

Achieving behaviour change for infection prevention and control

O25

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This interactive and lively full-day workshop provides an opportunity for delegates to develop an enhanced understanding of behaviour change theory and its application to Infection Prevention and Control practice. Using examples identified by delegates (e.g. hand hygiene, sepsis care), the moderators will guide a series of group exercises that will result in an enhanced understanding of behaviour change theory and its application to supporting clinical practice and the skills to design a tailored, theory based interventions to improve practice. Delegates will receive a “toolkit” of resources they can take away and use in the workplace.

Implementation of the IPC core components in low-resource settings

O26

Benedetta Allegranzi

World Health Organization, Geneva, Switzerland

The World Health Organization’s (WHO) work on Infection prevention and control (IPC) is aimed at preventing health care-associated infections (HAIs) by strengthening national and international IPC capacity and supporting implementation of safe

practices at the point of care. The IPC team leads networking, advocacy and global campaigning activities to promote IPC policies and best practices and develops evidence-based guidelines, and implementation and monitoring strategies and tools. WHO also provides technical expertise to countries to adapt and implement these resources. In this context, new evidence- and consensus-based Guidelines on core components of IPC programmes at the national and facility level were developed.

According to the AMR Global Database, 86% of countries have an IPC policy or plan but only 37% have national-wide implementation and monitoring of IPC measures at the facility level. This situation is poorer in low- and middle-income countries (LMICs). Robust evidence on the implementation of IPC interventions in low-resource settings is limited. There is a urgent need for capacity building and technical support to empower countries, in particular in LMICs. Therefore, the WHO IPC team has actively supported specific countries to assess and improve IPC according to specific methodologies documented in new implementation tools. This work and resources have been based on country missions and semi-structured interviews with IPC professionals from low-resource settings using a qualitative inductive thematic approach. The presentation will summarize this experience, present evidence-based results as well country examples highlighting the assessment and implementation approaches used and the challenges and solutions identified.

O27 Surveillance in limited resource settings - is it possible without laboratory facilities?

Nizam Damani

Southern Health and Social Care Trust, Portadown, United Kingdom

Surveillance has been described as the systematic collection, analysis, and interpretation of data on specific events (infections) and disease, followed by the dissemination of that information to those who can improve the outcomes.

Good diagnostic microbiology laboratory plays a pivotal role in the surveillance and control of healthcare-associated infections (HAIs). It helps diagnose various microbial diseases, identify the presence of pathogenic microorganisms, perform susceptibility testing to identify multi-resistant microorganisms, help typing of microorganisms for epidemiological investigations of an outbreak and perform trend analysis which is an essential part of a comprehensive Infection Prevention and Control (IPC) programme. In addition, laboratory services can act as a source of expert consultation both to clinicians and IPC practitioners for surveillance of HAIs and a good quality diagnostic service that serves as an 'early warning centre' for an outbreak.

Since surveillance of HAIs is a key component of the IPC programme, this can only be done by the provision of good quality microbiology service. In many low- and middle-income countries, the provision of laboratory support is either not available or very limited to support HAI surveillance using the most widely used CDC and ECDC definitions. The use of these definitions for calculating HAIs is important for consistency and international comparison. This presentation will focus on the issues and limitations of performing HAIs surveillance in low- and middle-income countries without adequate or limited laboratory facilities and support.

Experiences from the IFIC Mentor Scholarship Programme

O28

Ermira Tartari

University of Malta, Msida, Malta

Healthcare-associated infections (HCAIs) are common adverse events in acute-care medicine, causing significant morbidity and mortality. There has been a significant increase in the commitment to infection prevention and control (IPC) globally in recent years. IFIC aims to facilitate international networking in order to improve the prevention and control of healthcare associated infection worldwide. IFIC launched a mentoring/twinning exchange

scholarship programme, which allows for fostering a close working relationships between a centre of expertise in a developed country, and a facility from a low/medium resource centre. The programme aims to facilitate the sharing of knowledge and expertise in order to achieve best practice in IPC, all for the purpose of enhancing educational experiences between these entities. Mater Dei University Hospital, Malta was selected as a centre of expertise/excellence to the University Hospital Centre 'Mother Teresa' (QSUT) of Tirana, Albania between January 2015 and February 2016. QSUT is the largest hospital in the country with 1555 beds and the only tertiary-care referral centre for acute and critical patients. The programme aimed to achieve a close collaboration between different stakeholders including hospital leadership and IPC professionals. Participants from this collaboration visited the respective countries, firstly to perform a situation analysis of the IPC situation in Albania. Secondly, to learn on the ground with the IPC team in Malta, develop new approaches to organize an IPC strategy and acquire further knowledge and skills through educational sessions on hand hygiene monitoring, peripheral and central line management. The mentor exchange approach may serve as a reference model to education and training of IPC professionals worldwide.

O29 **Achieving a “safety first” culture in infection prevention and control: what can we learn from the aviation industry?**

Martin Egerth

Lufthansa Aviation Training GmbH, Munich, Germany

2017 was the safest year in the history of civil aviation. According to the ICAO accident statistics, there were 44 lost lives in 2017. Despite of this number, the number of preventable deaths annually as a result of medical errors is exponentially greater. Patients die daily due to human errors committed by doctors, nurses and hospital staff. Why then is there such a great emphasis on rules, regulations and standardized simulations and trainings in the aviation industry,

but not in the medical sector? How do we define safety and how can we continuously improve this notion? It is not only critical to reduce the human error in medicine, but also to develop a “safety first culture”. A safety culture, in addition to strengthening the interpersonal and personal skills for those working with or on patients, will result in proper error management, a positive working environment and ultimately less patients dying due to staff fatigue, a lack of assertiveness and hierarchy. This presentation will be more like a workshop, we will have a closer look at some tools and discuss some difficulties in the daily operation. We will have a closer look at the team, but also on the role of ego, why the selection of the right people is as essential as the definition of a safety goal. Empathy and Inspirations will also be two topics that will be addressed.

Waterborne pathogens and hospital acquired infections: does it take a drought to save patient lives?

O30

Michael Weinbren

Kings Mill NHS Foundation Trust, Sutton-in-Ashfield, United Kingdom

Despite advances in understanding of the role of water in relation to infection, there has been a strong counteracting force limiting progress. Examples spanning the centuries will be provided. Understanding of this force is required if we are going to make future inroads into prevention of waterborne infections.

Within the UK the neonatal outbreak of *Pseudomonas aeruginosa* in 2011/2 in Belfast linked to contaminated water was the impetus for change in the way water was managed in healthcare settings. As a result, national guidance was issued to minimise the risk of waterborne infections in augmented care units. However, is this sufficient?

Hand washing is widely accepted as being the most effective barrier to cross infection. It is frequently

performed at hand wash stations, an interface between water supply and drainage systems. How safe are hand wash stations? What part do drains have, if any, in transmission events?

The talk will explore what the true burden of waterborne infections is. Are we good at detecting waterborne transmission events in hospital?

The emergence of highly resistant organisms (Carbapenemase Producing *Enterobacteriaceae*) threatens to bring about the end of the antibiotic era. Does waterborne transmission have a role to play?

O31 **New treatment options for multidrug-resistant Gram-negative bacteria**

Agnieszka Laudy

Medical University of Warsaw, Poland

The World Health Organization in February 2017 published the list of the multi-drug resistant bacteria for which new antibiotics as well as new treatment options are urgently needed. The most critical group of these pathogens includes Gram-negative rods as *Acinetobacter baumannii*, *Pseudomonas aeruginosa* and *Enterobacteriaceae* resistant to carbapenems and third generation cephalosporins. Currently, the main direction of antimicrobial research is searching for new antibiotics and chemotherapeutics within the already known groups of antibacterial drugs. Several new compounds from beta-lactams, fluoroquinolones, tetracyclines, and aminoglycosides groups there are in clinical trials. Moreover, benzoxaboroles are novel, promising group of antimicrobial compounds. Besides looking for compounds with the direct activity against Gram-negative rods, equally important direction of antimicrobial investigations is searching for new beta-lactamase inhibitors. The clinical strains of Gram-negative rods producing enzymes as KPC, ESBLs or extended-spectrum AmpCs (ESACs), constitute a global threat. More recently, the two classes of beta-lactamase inhibitors are in the interest of

researchers: the diazabicyclooctane compounds (avibactam and relebactam) and inhibitors based on a cyclic boronic acid (vaborbactam).

A question may arise, whether the demonstration of the activity of new compounds against Gram-negative rods during the clinical trials gives us the sense of success in combating infections? Unfortunately not, within a short time after the introduction of a new medicinal product, bacteria are able to acquire or develop resistance mechanisms. Beside, the development of drug dosing regimen for new agents is necessary to reduce the selection of drug-resistant mutants. Other non-antibiotic treatment options for bacterial infections involve phage-therapy and microbiome modulation.

Multidrug-resistant tuberculosis

O32

Ewa Augustynowicz-Kopeć, Anna Zabost

Department of Mycobacteriology, National Tuberculosis and Lung Diseases Research Institute, National Tuberculosis Reference Laboratory, Warsaw, Poland

Mycobacterium tuberculosis is transmitted in airborne particles called droplet nuclei that are expelled when persons with pulmonary or laryngeal TB cough, sneeze, shout, speak or sing. The tiny infectious particles can be carried by air currents throughout a room or building. The recent resurgence of TB together with the ongoing HIV epidemic has resulted in a larger number of infectious TB patients being admitted to health care facilities. Local public health agency personnel are potentially exposed to TB during case management activities such as directly observed therapy TB or when persons with unrecognized pulmonary TB are present in the agency facility. Health care workers in most facilities are at high risk of becoming infected with tuberculosis (nosocomial transmission). It is therefore very important to have guidelines for infection prevention and control in order to prevention of tuberculosis transmission. Many years of research on tuberculosis transmission in the environment of patients indicate, that the risk of infection among close contacts is very high.

Therefore, epidemiological investigation should be extended to all persons who have contact with the TB patient and under special review should be the people living in the environment with patients with drug-resistant tuberculosis MDR-TB. Infectious MDR-TB patients serve as even greater potential infectious sources because they often remain AFB smear and culture positive for months to years.

The keys to the prevention of nosocomial and occupational transmission of *M. tuberculosis* is conducting a risk assessment for each area of the facility and instituting appropriate control measures.

O33 Non-fermenting Gram-negative rods – multidrug resistance

Tomasz Bogiel, Eugenia Gospodarek-Komkowska

*Microbiology Department,
Collegium Medicum in Bydgoszcz,
Nicolaus Copernicus University in Toruń, Poland*

Gram-negative non-fermenting rods are together one of the most commonly isolated bacteria from clinical specimens. *Pseudomonas aeruginosa*, *Acinetobacter baumannii* and *Stenotrophomonas maltophilia* species are the most often isolated and the most important representatives. Their importance in hospital outbreaks of different localizations (respiratory and urinary tract, skin and soft tissues, bacteraemia) is constantly growing.

Low nutrition requirements of non-fermenting rods and their natural resistance to a number of antimicrobials used in a standard empiric therapy make them potentially dangerous threat. Moreover, their increasing isolation frequency is accompanied by the reduced susceptibility to standard therapy due to the ability to acquire new resistance mechanisms to other antimicrobials. Multi-drug resistant (MDR), extremely-drug resistant (XDR) and pan-drug resistant (PDR) strains appear more often in nosocomial outbreaks. It makes the treatment more and more difficult and additionally underlines the necessity of the resistance epidemiology monitoring as a crucial task for the empiric therapy schemes establishment.

At present, there are limited antibiotic regimens for the treatment of infections of different localizations caused by drug resistance bacteria. In terms of increasing antimicrobial resistance of Gram-negative rods clinicians are forced to consider e.g. different treatments of nosocomial and outpatients' infections, use of new or alternative therapeutic options, combined or experimental treatment. The lecture will be an attempt to explain complexity of drug resistance phenomenon of Gram-negative bacteria and the overview of current therapeutic options for the treatment of infections caused by non-fermenting rods, e.g. usefulness of ceftolozane-tazobactam and ceftazidime-avibactam combinations, synergistic effects of antimicrobials combined with antimicrobial peptides and novel combinations of well-known antibiotics.

Antibiotics in different combinations against multidrug-resistant Gram-negative bacteria

O34

Beata Kowalska-Krochmal

Wroclaw Medical University, Poland

Nowadays infections caused by multidrug or pandrug resistant bacterial strains are being noticed with rising frequency. Current medical knowledge provides only few effective therapeutic options or, in worse case, it sometimes happens that none of used antibiotics is effective. Additionally today more often than it used to be more than one bacterial strain take part in infection. Both polibacterial aetiology and multidrug resistance force us to use synergy antibiotic therapy. The empirical therapy also may need using antibiotics in combination. The simultaneous usage of few drugs may result in such effects as synergism, addition or antagonism. First two of them can positively influence the effectiveness of eradication of pathogens but the antagonism is the unwelcome effect, so it is definitely worse option than monotherapy. Unfortunately our abilities to predict consequences of combined therapy are limited. The predictions are mostly based on *in vitro* studies rather than clinical researches.

Nevertheless bacterial multidrug resistance, which is mostly connected with production of carbapenemases by Gram-negative rods, made scientists all around the world to intensify their researches on different combinations of antibiotics and the potential effectiveness of those combinations. In consequence colistin got into the spotlight. It's one of few or maybe even the only one antibiotic which is effective in therapy against NMD1, KPC or OXA-48 positive strains. During this short presentation the special attention will be paid to effectiveness of combinations of colistin and fosfomycin with other antibiotics in the therapy of infectious caused by carbapenemase producing bacteria.

O35 The application of next generation sequencing in clinical microbiology and infection prevention

Monika Chlebowicz

University Medical Center, Groningen, The Netherlands

Current molecular diagnostics of human pathogens provide limited information that is often not sufficient for outbreak and transmission investigation. Next generation sequencing (NGS) determines the DNA sequence of a complete bacterial genome in a single sequence run, and from these data, information on resistance and virulence, as well as information for typing is obtained. Generated data are useful for outbreak investigations and can be further used for the development of outbreak-specific screening tests. Further data can be used for epidemiology on local and international level, molecular case finding, characterization and surveillance of pathogens, rapid identification of bacteria species using the 16S-23S rRNA region, taxonomy, metagenomics approaches on clinical samples, and the determination of the transmission of zoonotic micro-organisms from animals to humans. The applications of NGS in the clinical setting at the medical microbiology diagnostic laboratory at the University Medical Center Groningen in The Netherlands will be presented.

O36 Hand Hygiene World Café "Revisiting the reasons why the 5 Moments concept is the right one!"

Benedetta Allegranzi

World Health Organization, Geneva, Switzerland

Hand hygiene is a cornerstone of infection prevention. Monitoring hand hygiene adherence and providing performance feedback to health care workers is a critical component of the WHO multimodal hand hygiene promotion programme. "My five moments for hand hygiene," a user-centred design approach has been developed for measuring, teaching, and reporting hand hygiene adherence. This interactive workshop will discuss the "My five moments for hand hygiene," application concept based on the core design principles of a World Café. World Café conversation will evolve around small round tables with small groups of participants engaging in constructive dialogue around questions on "My five moments for hand hygiene" and their relevance in clinical practice. At the end of the twenty minutes, groups will move to a different new table. Ultimately the moderators will share insights and results with the larger group.

O37 Hands on hand hygiene observations – interactive discussion of practical examples

Ermira Tartari

WHO Collaborating Centre on Patient Safety, University of Geneva Hospitals, Switzerland

Monitoring hand hygiene adherence and providing performance feedback to health care workers is a critical component of the WHO multimodal hand hygiene promotion programme, but important variations exist in the way adherence is measured. The World Health Organization's (WHO) First Global Patient Safety Challenge known as "Clean Care is Safer Care," an evidence-based, user-centered concept, "My five moments for hand hygiene," has been developed for measuring, teaching, and reporting hand hygiene adherence. We describe the

WHO hand hygiene observation method in a hands on interactive session that will stimulate discussion around the identification of the right moments for hand hygiene.

Infection prevention and control (IPC) practitioners establish the institution's hand hygiene infrastructure, lead training programs and spearhead hand hygiene improvement activities and scientific research agendas. The use of a multimodal approach to learning and a diversity of audio-visual video reviewing of real clinical scenarii, role-plays with discussion and immediate performance feedback will be emphasised. Simulation-based learning for the mastery of unobtrusive direct observation of hand hygiene practices, is considered the gold standard for evaluating compliance.

O38 Understanding the patient experience of healthcare associated infection: a qualitative systematic review

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Introduction

Healthcare associated infections (HAI) are the most frequently occurring adverse event worldwide, with reports from high income countries indicating a combined prevalence of 7.6% (Allegranzi *et al.* 2011). The global burden of HAI is well-recognized; what is less well known is the impact HAI has on patients. In order to develop acceptable, effective, patient-centred interventions, greater understanding of patients' experience of HAI is needed.

Objectives

This paper reports on a recent systematic review and meta-synthesis of qualitative research, which sought to explore adult patients' experiences of common healthcare associated infections.

Methods

Five databases were searched. Search terms were combined for qualitative research, HAI terms and patient experience. Study selection was conducted by two researchers using pre-specified criteria. CASP quality appraisal tools were used. Internationally recognised PRISMA guidelines for reporting systematic reviews were applied. Noblit and Hare's (1988) approach to meta-synthesis was adopted.

Results

Seventeen studies (2001-17) from five countries addressing five common types of HAI met the study inclusion criteria. Four inter-related themes emerged: 'the continuum of physical and emotional responses'; 'experiencing the response of healthcare professionals'; 'adapting to life with an HAI'; and 'the complex cultural context of HAI'.

Conclusions

The impact of different HAIs may vary; however, there are many similarities in the experience recounted by patients. The bio-socio-cultural context of 'contagion' was graphically expressed, with potential impact on social relationships and professional interactions highlighted. Greater understanding of the patient experience of HAI can equip healthcare professionals to provide better quality care.

Characterization of hospital cleaning services in the State of Sao Paulo, Brazil

O39

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Background

Antimicrobial resistance is a public health problem. Poor environmental cleaning practices may result in spread of resistant pathogens. Understanding current hygiene practices in hospitals is a key element to propose improvements.

Objective

To characterize structure and processes of hospital cleaning services (HCS).

Methods

A cross-sectional study was performed by hospital infection division from the São Paulo State Health Department in hospitals in the State of Sao Paulo, Brazil (n=756) between June and August, 2016. An electronic survey was addressed to professionals of hospital infection control committee (HICC). A first message was sent to eligible settings, with an additional message for non-respondents after 45 days. Non-respondents after 60 days were excluded. Four dimensions were addressed: characterization of hospital, HICC, HCS, and cleaning monitoring.

Results

Response rate was 30.7% (232). Most hospitals, 166 (71.5%) were private; 36 (15.5%) had external quality accreditation. The mean number of nurses and physicians in HICC was 1.5 and 1.3 respectively. HCS was outsourced in 81 (34.9%); cleaning/ disinfection routines were available in 226 (97.4%), with defined responsibilities in 201 (86.6%) hospitals. HCS training program was reported by 183 (78.8%) and HICC approval for HCS training and disinfectants by 180 (77.6%) and 179 (77.8%), respectively. Cleaning monitoring was performed in 163 (70.3%), with objective methods in 42 (18.2%). Most frequently monitored surfaces were doorknobs (90.8%) and bed rails (89.6%).

Conclusion

There are opportunities for improvement in HCS regarding education programs, disinfectants standardization and methods of cleaning monitoring; these will be the focus of a further statewide program for improvement of hospital hygiene.

Multisite study to examine the extent of bacterial contamination in hospital washrooms according to hand drying methods: results of the Italian site

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Background

Hand hygiene is one of the most important components of infection prevention. Few studies have focused on the contribution of hand drying method to the dissemination of potential pathogens.

Materials and methods

We performed a multicentre study with internal crossover, switching between hand drying by either paper towels (PT) or a jet air dryer (JAD), to compare bacterial contamination levels within hospital washrooms. Sixty daily sampling sessions occurred during 6 intervention periods over 12 weeks across 2 washrooms per 3 hospitals (Italy, UK and France). Total and specific bacteria were cultured from air (Coriolis sampler), surfaces (sponges) and dust (vacuum cleaner).

Results

In Italy, total bacterial recovery was significantly greater from the JAD outer surface versus PT dispenser (median 0 vs 100 CFU, p=0.00001). A significantly higher frequency of bacterial recovery from the JAD box rather than the PT box (40 vs 4 p<0.00001) was highlighted. Total aerobic bacterial recovery was similar from the air, door and sink with very low numbers of bacteria recovered. A higher bacterial recovery from the dust of the PT washroom was observed (not statistically significant).

Conclusions

Italian results were basically consistent with UK and French data, confirming that surface bacterial

contamination was generally higher in washrooms using jet air dryers compared with paper towels. However, in Italy only a limited range of bacteria were recovered, suggesting possible differences in washroom cleaning practice.

Our results suggest that options for washroom hand drying have differing potential for environmental bacterial contamination.

O41 Development of a successful programme to reduced catheter-related blood stream infections

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Introduction/aims

Central venous catheter related blood stream infections (CRBSI) cause increased mortality and morbidity in patients; many of these are preventable using evidenced based care. Matching Michigan, a national project focused on critical care units to reduce CRBSI using a quality improvement programme. Following improvements in critical care it was agreed, to implement across the whole hospital ensuring that all patients with central venous access devices (CVAD) received safe and effective care.

Interventions

A CVAD Steering group was set up with all key stakeholders. It was important from the outset to establish an outcome measure to demonstrate improvements in practice with the obvious measure being CRBSI. Potential CRBSI were identified by the microbiologists (numerator) and a process to collect the number of line days (denominator). All cases of CRBSI are investigated using root cause analysis (RCA) and the learning shared with the Steering Group to action changes to practice.

Results

During the last five years, learning from CRBSI has allowed improvements to practice including standardised care pathways, training and competency

framework, routine MSSA and MRSA screening and a change to chlorhexidine island dressings. Evidence of the improvement is seen in the surveillance data with the rate of CRBSI falling from 5/1000 line days in 2011 to 0.6/1000 line days.

Conclusions

We are able to monitor the rate of CRSBI for each department with patients with CVAD and we can accurately assess problems and spot trends at an early stage to implement effective change as required.

Hospital hygiene project in Mongolia

O42

Walter Popp

HyKoMed GmbH, Dortmund, Germany

The Mongolian Emergency Service Hospital Hygiene Project (MeshHp) is working since 2010. It is a grassroot project which was financed for 3 years by the German Ministry of Health and after that by sponsoring.

The main area is capacity building in hospital hygiene and in emergency medicine. Therefore, repeated trainings are done in Germany as well as in Mongolia. Until now 20 Mongolian groups have come to Germany with up to 100 different persons.

The main result in Mongolia is the improvement of hand disinfection in the public hospitals. Starting from pieces of soap and no alcoholic handrub, now most of the hospitals have alcoholic disinfectants, liquid soap and in many cases single use paper towels.

The main problem in the Mongolian healthcare system is the high carrier rate of hepatitis B and C with up to 20% in the population. Only children are vaccinated against hepatitis B from 1991 on and when the Meshhp project started only 10% of the healthcare workers were vaccinated. Mainly because of the MeshHp project, there was an order in 2012 from the Mongolian Ministry of Health that healthcare workers should be vaccinated, now the vaccination rate is between 60-80%. Also there

are some improvements in reprocessing of medical devices. A main problem is financial shortage of public hospitals.

A lot of work is put in information of the public and publication of papers in scientific journals.

Looking back 7 years we think that the MeshHp project is quite successful and we hope that it can work for another lot of years.

O43 Evaluating a medical paper

Kathryn Suh

The Ottawa Hospital, Canada

The number and availability of medical journals is increasing. Change in healthcare often results after dissemination of new research findings, typically as papers published in medical journals. With this in mind, it is essential that readers of medical publications understand how to evaluate a medical paper, with consideration of the:

- quality of the research,
- strength of the research findings,
- applicability to individual settings.

Using an interactive approach, this session will address how readers (in particular those who are novice or less-experienced) can better evaluate medical publications. Time permitting, we may also address how journal editors and article reviewers evaluate manuscripts submitted for publication in medical journals.

O44 Sepsis and stewardship – friends or foes?

Fidelma Fitzpatrick

Royal College of Surgeons in Ireland and Beaumont Hospital, Dublin, Ireland

Timely empiric antimicrobial therapy is an essential part of the management of patients with sepsis.

However, a much-discussed potential unintended consequence of sepsis programmes is their impact on antimicrobial resistance (AMR) rates. This concern is not unfounded due to changing definitions of sepsis, lack of reliable sepsis biomarkers and lack of rapid diagnosis/antimicrobial susceptibility of bacterial infection to guide targeted therapy.

The first step in sepsis management pathways is recognition of patients with sepsis, however this itself can present difficulties in a busy healthcare setting; there are no specific pathogens associated with sepsis and indeed frequently pathogens are not identified, viral infection can cause sepsis and sepsis itself can mimic other types of (non-infective) presentations. This lack of sepsis diagnostic specificity coupled with a time dependent need to start antimicrobials likely contributes to inappropriate broad-spectrum antibiotic use. In addition, much of the focus of sepsis programmes is on the initial choice of empiric antimicrobials with less emphasis placed on appropriate antimicrobial de-escalation. Hence why managing sepsis in the age of AMR has to be linked tightly with antibiotic stewardship.

This presentation will review the recent evidence behind sepsis definitions and time targets and their impact on antimicrobial stewardship programmes and propose that early alignment of sepsis and antimicrobial stewardship programmes coupled with an equal focus on patient recognition and reassessment is essential for patient safety and AMR prevention.

Can behavioural economics explain and improve antibiotic prescribing? **O45**

David Jenkins

University Hospitals of Leicester NHS Trust, Loughborough, United Kingdom

Antimicrobial resistance is arguably the most urgent problem facing healthcare in the 21st century. Resistance mechanisms have accumulated in many pathogens and, at the same time, there has been a dearth of new antibacterial classes. The combination

of resistance and no new antibiotics makes antibiotics, at best, an only partially renewable resource. Without effective antibiotics many infectious diseases will be incurable and the absence of prophylaxis will make many surgical procedures too hazardous to contemplate. The primary driver of resistance is the use of antimicrobials and so the concept of antimicrobial stewardship has been developed, an idea that aims to limit the use of antibiotics to the prevention or treatment of serious infections. A central element of stewardship is understanding how prescribing decisions are made, particularly when most prescribing is empirical, without confirmation of the antimicrobial susceptibility of the infecting organism, or even before a firm diagnosis of infection has been made. Decisions under conditions of incomplete information and uncertainty are a central problem for behavioural economics, an emerging discipline that has delivered valuable and often counter-intuitive insights into how humans use limited resources. This presentation will highlight how behavioural economics can provide a theoretical framework for the development of antimicrobial stewardship and contribute to the preservation of antimicrobial efficacy.

O46 Surgical prophylaxis: using behaviour change principles to improve practice

Michael Borg

Mater Dei Hospital, Msida, Malta

Surgical prophylaxis is - at face value - an inherently simple practice. There is abundant evidence that shows that the antibiotic should be administered within the 60 minutes before knife to skin and then should not be administered for more than one dose (or at most, not longer than 24 hours). Nevertheless, studies show that this is not at all straightforward, with incorrect dosing and especially prolonged administration, frequently reported. Using a behavioural science basis, and publications in the literature, the presentation will provide an overview of possible effective interventions that go beyond the issuing of a set of guidelines.

**Knowing how to act in a situation:
the French approach of infection control
practitioner core competences**

O47

Pascal Astagneau

French Society for Hospital Hygiene, France

Infection control has been a priority of public health policy in France. Since the mid 1990's, the first IC teams were required by regulation in each hospital, leading to upgrade expertise and competencies. Beside, new challenges have become of immediate concerns for ICP including emerging antibiotic resistance, global patient safety approach, development of new technologies and ambulatory cares, changes in care organization and resources. To answer these issues, a 10-members expert group of the Society for IC (SF2H) was designed to set up a standard guideline to determine the core competencies needed for ICP in routine. A pattern of Key Situations (KS) regarding infection control was identified. For each KS, the guidelines describes the process and steps, how to act at each step, and the expected results. For instance, for the KS « outbreak investigation », the « what has to be done by the ICP » was described at the different steps of the process, and the expected results were stated. The same description was done for other KS, such as Building a guidelines for HAI prevention, Implementing AMR prevention programme, Implementing prevention measures for environmental risk, or Providing expertise for leading structures and management projects. The evolution factors related to institution and policy, care practices, scientific knowledge, professional network, or training level were also considered as well as the human resources in terms of knowledge and know-how for each KS.

O48 The competences of the infection prevention specialist in the Netherlands
Heidi Schijf
Spaarne Hospital, Hoofddorp, The Netherlands

In an organization, the position of the infection prevention specialist has to be so that it can function independently, without conflicting interest of regular or medical management. The expert infection prevention has a substantive collaboration with the microbiologist, in which both functions are complementary.

The training for infection prevention specialists is a post-post bachelor study. Students therefore are required to have a University of Professional Education.

Additionally, the infection prevention specialist is registered in the quality register of the professional association. The goal of this quality register is to ensure that a registered member meets the conditions set by the organization for the proper execution of the profession.

A competence is a combination of knowledge, insight, skills, motivation, attitude and personal traits that are necessary for an expert infection prevention to act effectively in a professional situation. Being competent thus means more than having professional knowledge and having the skills alone. The professional conduct of an infection prevention specialist can be subdivided in 5 competence areas:

1. Administrative organizational competencies such as goal oriented, planning and organizing.
2. Social communicative competencies such as persuasion, working together, communicative skills, computer skills, organizational awareness, negotiating and networking.
3. Intellectual competencies such as expertise, analytical skills, judgment skills and creativity.
4. Emotional competencies such as stress-resistant, confidence, empathy, integrity, self-reflection and mood.
5. Task-oriented competencies such as flexibility, decisiveness, independent quality awareness, assertiveness and taking initiative.

O49 Competences of the infection prevention specialist in Croatia
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Clinical Hospital Center Zagreb, Croatia

Hospital infections are a great problem in healthcare institutions around the globe. In the Republic of Croatia there is formal continuing education of nurses (ICN) for hospital infection control from 1998, and basic education from 2005. For medical doctors, there is only formal continuing education (from 1992). In 2004, Reference centre for hospital infections made the Plan and Program for basic education of ICN. In the beginning the courses were held in CHC Zagreb during a 6-month period (one week per month). In the basic education specific goals were to learn about; role of ICN and infection control team, to learn the basic principles of clinical microbiology and infectious diseases important for prevention and control of hospital infections, to become familiar with epidemiological and statistical methods important for surveillance of hospital infections, to learn about principles and practice of sterilization, disinfection, hand hygiene, etc. The course lasted all together 300 hours. Direct teaching was 180 hours (30h of lectures, 60h seminars, and 60h of training/practical work and 30h of general discussion) plus 120 hrs work between two moduls. In 2012 the courses continued but now it is taking place at the Medical School in Zagreb, and in the years 2013, 2015 and 2016 it was under the name "Prevention and infection control related to healthcare". In the Republic of Croatia 80% ICP have completed courses which are obligatory and legally required. In the last 20 years there have been significant improvements for continuing the education of professionals (ICP) in prevention and control of infection.

O50 Infection prevention specialist competency framework for infection prevention and control

Helen O'Connor

Homerton University Hospital, London, United Kingdom

This presentation aims to share the development work on clinical competences for a wide range of practitioners working in the field of infection prevention & control. It gives a brief historical background from the first competences in 2000 to today. Today's competences are aimed at every level of practitioner from a primary level through to advanced and finally expert. Within these levels the practitioners is encouraged to identify whether they are working with assistance, supervised or independently all of which contribute to a personal assessment. An example will be demonstrated using one of the domains.

3. Decontamination of surfaces and equipment by hydrogen peroxide gas and other oxidative agents including an overview of the most common methodologies, an assessment of area decontamination as tool for prevention of transmission in hospitals
4. The use of ultraviolet light for decontamination of air and surfaces including:
 - current methods and guidelines to assess UV-based devices for air decontamination;
 - activity of UV-based devices against major types of airborne pathogens;
 - relative benefits and short-coming of UV disinfection of air;
5. Prevention of contamination of environmental surfaces by decontaminating air in the same setting.

O51 Environmental decontamination

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This workshop will cover the following topics through a mixture of interactive presentations as well as group work and feedback:

1. Testing and standards for chemical disinfectants
2. Antimicrobial wipes for disinfection of surfaces including:
 - the relevance of high-touch environmental surfaces (HITES) as potential vehicles for healthcare-acquired infections;
 - testing of disinfectant-soaked wipes for HITES decontamination;
 - the risk of spread of pathogens to clean areas during improper wiping of surfaces;
 - the types of surfaces and pathogens to focus on for wiping for optimal risk reduction;
 - current methods to assess the decontaminating activity of wipes.

Problems with the treatment of infections in older patients with fragile syndrome

O52

Barbara Gryglewska

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Frailty syndrome is a consequence of cumulative decline in many physiological systems with vulnerability to poor resolution of homeostasis after a stressor event. Frailty affects 13% to 28% of older adults and up to one-third of those 80 years and older. Frail elderly patients are at particularly high risk for the development of infectious diseases. Many comorbid conditions predispose people to infections. Moreover, immunosenescence, affecting both the adaptive and innate immune systems, contributes to an increased risk of infection, but fails to respond appropriately to the stress of acute inflammation. Signs and symptoms of infections in the frail elderly are often atypical, causing a delay in diagnosis and treatment. The most frequent infectious diseases are pneumonias, urinary tract infections, skin infections, and gastroenteritis. Nursing home residents with diagnosis of frailty and physical incapability are more likely to suffer from acute infections compared to healthy elderly individuals. Treatment of infections may cause side effects because pharmacokinetic and pharmacodynamic changes of drugs and possible drug interactions.

O53 Emerging and re-emerging infections in elderly patients
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 Central Clinical Hospital, Warsaw

Elderly patients are particularly prone to healthcare-associated infections (HAIs) due to many risk factors, such as immunity declining with advanced age, underlying diseases (e.g. diabetes, malignancies, chronic obstructive pulmonary disease), frequent hospitalisations and administered treatment.

At present, infections caused by *Clostridium difficile* remain a challenge in hospitalised patients, with an increased risk of unfavourable outcome in the elderly. Similarly, the spread of multidrug-resistant (MDR) Gram-negative rods is a worldwide problem, with emphasis on a high rate of colonisation among the institutionalised elderly patients. In many parts of the world, control of meticillin-resistant *Staphylococcus aureus* (MRSA) remains a priority. Recently *Corynebacterium striatum* has emerged as healthcare-associated pathogen.

Many viral infections are particularly dangerous to patients at extremes of age. The highest rates of influenza-linked respiratory deaths are reported in adults aged 75 years and older. The respiratory syncytial virus (RSV) has been known as a pathogen prevalent in infants and young children, however it is increasingly reported in the elderly. According to the Centers for Disease Control and Prevention (CDC) it is estimated, that in the USA alone >177,000 older adults are hospitalised each year due to RSV infection, with 14,000 fatal cases. In recent years, rotavirus and norovirus outbreaks have been particularly common in geriatric patients. Control of such epidemics in the healthcare institutions is very difficult. Another viral disease – shingles (herpes zoster) – typically affects elderly adults, as with age-related decline in immunity the risk of varicella-zoster virus (VZV) reactivation increases.

In recent years a new species of *Candida* – *C. auris* – has been described. At present this pathogen is spreading worldwide. CDC reported that within one year of issuing a clinical alert on this MDR species, the number of *C. auris* cases has increased more than 11 times. In contrast to other *Candida* spp. responsible usually for endogenous infections, *C. auris* is causing hospital outbreaks.

O54 Chronic wounds – can we deal with them and be successful?
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 and Parasitology, Wroclaw Medical University, Poland

Chronic wounds protracted with infective complication still pose a significant threat to health and life of patient and are economic burden for healthcare system. Majority of microbes within a chronic wound exists in specific societies of cells embedded in extracellular matrix, referred to as the biofilm. These structures are highly resistant to immune system and antimicrobials, including antibiotics. However it seems that recent advances in the field of microbiology, antisepsis and dressing-related science brought us closer to the solution of the aforementioned issue, i.e. to utilization of combined antimicrobial and healing-promoting measures able to provide favorable environment for patient cells and able to eradicate biofilms within, respectively. One should remember that even the most advanced methods aimed to close non-healing chronic wound are of low efficiency if patient com-morbidities, being frequently the first reason of chronic wound formation, would not be treated and managed in the proper way.

O55 Prevalence of healthcare-associated infections in European long-term care facilities
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 Maria Luisa Moro²**

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Background

The European Centre for Disease Prevention and Control (ECDC) monitors healthcare-associated infections (HAIs) and antimicrobial use (AU) in long-term care facilities (LTCFs) through repeated point prevalence surveys (PPSs) in EU/EEA Member States (MSs). So far, three PPSs (called HALT) were conducted (2010, 2013 and 2016-2017).

Methods

National/LTCF teams use a standard protocol to collect data on HAIs and AU from residents and indicators of infection prevention and control (IPC) and antimicrobial stewardship at LTCF level. For HALT-2 onwards, algorithms for HAIs adapted from US CDC/SHEA case definitions are applied to each resident with signs/symptoms. In HALT-2, the HAI onset had to occur >48 hours after the resident was (re-)admitted to the LTCF. A validation survey estimated sensitivity and specificity of HAI and AU data collection.

Results

HALT-2 was conducted in 1181 LTCFs in 17 MSs. The majority of participating LTCFs were nursing homes (64.5%). The prevalence of HAI and systemic AU was 3.4% and 4.4%, respectively. The most frequently reported HAIs were respiratory tract infection (31.2%), urinary tract infection (31.2%) and skin infection (22.8%). The total number of HAIs occurring every year in European LTCFs was estimated at 4.2 million HAIs. The sensitivity and specificity of HAI data collection was 76% and 99% respectively.

Conclusion

The collected PPS data provide a valuable insight into HAIs and antimicrobial use in participating countries and LTCFs. The survey helps to improve LTCF surveillance skills and raises awareness for prevention and control of HAIs and prudent antimicrobial use.

Healthcare-associated infections in Polish long term care facilities

O56

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The epidemiology of HAI in long term care facilities (LTCFs) has so far been the subject of very few studies in Poland. One of them was the point prevalence study of HAI conducted in 2017 in selected LTCFs in Poland. The study was a part of point prevalence survey of HAI and antimicrobial use in European LTCF (HALT-3) run by European Centre for Disease Control and Prevention. The survey involved 25 Polish LTCFs, including 13 nursing homes (NH) and 12 residential homes. The number of resident admitted to the study was 2,313, including 33% of residents over 85 years of age. Most residents were persons with impaired mobility - 67%, with disorientation in time and/or in space - 55%, and with incontinence (faecal and/or urine) - 74%.

The average prevalence rate for HAI was 4.2% (range: 0.0 to 17.5%), and at least one antibiotic was taken by 4.3% of residents (range: 0.0-15.8%). The most cases of HAI were urinary tract infections - 27%, followed by skin and soft tissues infections - 26% and lower respiratory tract infections - 22%. In 76% cases of HAI no microbiological diagnostics was performed. Only 52% of LTCFs (100% NH) declared monitoring of HAI.

The results of the study confirm that HAI in LTCFs in Poland is a significant problem and that availability of microbiological diagnostics in these healthcare settings is extremely unsatisfactory.

Outbreak! Planning and executing a successful investigation

O57

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²International Federation of Infection Control, Norwich, United Kingdom

Outbreak investigation is an essential activity of infection prevention and control programs. How do you identify that an outbreak is occurring? What steps should you take to investigate an outbreak and why are they important?

This interactive 90-minute session will lead participants through the principles of outbreak investigation, using two examples in the hospital setting.

O58 Light and shadow in infection control in Poland over the years

Piotr Heczko

Chair of Microbiology, Jagiellonian University Medical College and Polish Society of Hospital Infections

Knowledge on importance of hospital acquired infections (HAI) and demand for their prevention has emerged in Poland already in seventy years of the twentieth century. Thanks to financial support from the US, it was possible to apply and get a CDC grant to study hospital epidemiology and to obtain first sound data from active surveillance performed in a dozen of Polish surgical, pediatric and neonatal wards by medical staff. Nearly in the same time, antibiotic resistance of the major hospital pathogens reached awareness of the healthcare professionals due to isolation of first MRSA strains in Polish hospitals. However, presence of HAI was totally neglected by central and regional healthcare administration for next 20 years. The change of the political system and joining EU enabled IC specialists in Poland to join various international activities and to build IC systems at hospital level and to establish 2 important societies: Polish Society of Hospital Infections and Polish Association of Epidemiology Nurses which promote IC, and train and educate all healthcare professionals in this field. Also, local activities in IC training were established, like as Society of Hospital Epidemiology which is a local activity of the Western Pomerania Doctors' Chamber or Lesser Poland Association of Hospital Infections

Teams and Committees

The most prominent activities which influenced professional level of IC specialists in last 28 years were related to participation in research projects founded by UE, in activities of the ECDC and ESCMID and in many international meetings and conferences.

Still, a support from the central and local public health institutions to promote infection control in Polish hospitals was further negligible with one important exception: establishing a specialty in hospital epidemiology for highly educated nurses based on syllabus similar to this of SHEA. Thanks to this, infection control in Polish hospitals is now in hands of well-educated epidemiology nurses, although mostly without medical leaders.

IC teams are active in practically all Polish hospitals and IC programs in acute care hospitals are nowadays based on team-based prevention of HAI utilizing evidence-based interventions such as proper hand hygiene, barrier precautions etc.. As mentioned above, unfortunately, there are only a few IC leaders in our hospitals: medical microbiologists and/or trained infectious diseases specialists. This situation causes problems in creating successful programs in IC supported by management teams. To overcome, this deficit at least in part, postgraduate teaching on IC was introduced by Medical Faculty of the Jagiellonian University and appropriate textbook provided.

Hospital acquired infections registration, reporting and analyzing at regional and central level is one of the essential elements of the infection control programs. In 2011 Polish Society of Hospital Infections has developed HAI surveillance program convergent with current recommendations in the European Union based on the ECDC HAI-Net system. It appeared that epidemiological situation in the studied wards was diverse, and general rates varied from 6.25 to 26.64% for 100 admissions. Unfortunately, introducing HAI-Net recommendations concerning HAIs surveillance in Polish hospitals encounters difficulties connecting with the lack of principles and requirements on the national level.

Poster Presentations

P1 **Proper adherence to tuberculosis treatment as a main prerequisite of effective infection control**

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NGO Infection Control in Ukraine, Kyiv, Ukraine

Patients with active tuberculosis (TB) stop transmit infection after two weeks of the treatment. At the same time, low treatment adherence and interrupted drugs intake can lead to renewal of infective droplet nuclei production.

In 2017 NGO "Infection control in Ukraine" implemented the project on TB outpatient treatment in Chernihiv oblast and the city Zhytomir (Ukraine). To ensure proper treatment adherence and, ultimately, safety of the contacts, the NGO established a system of civil monitoring. During six months, four monitors supervised directly observed treatment (DOT) of 50 TB patients, apart from routine DOT provided by health care workers (HCW). They used Morisky medication adherence scale (MMAS-8) to evaluate the adherence rate. Initially, only 12 percent of the patient had high adherence rate, 63 had moderate rate, and 25 percent had low rate; the monitors discovered that five of 50 patients in fact missed the prescribed doses, regardless formal DOT. Close dual observation done by HCW and non-medical monitors during the treatment course, included patient education, peer support, contact tracing and continual adherence control.

By the end of the treatment course, re-evaluation against MMAS-8 demonstrated significant

improvement of adherence rate: no patient had low adherence, 80 percent had moderate and 20 percent had high adherence rate. Among 220 contacts, no new TB cases were detected during the observation. Therefore, civil monitoring is an effective tool to improve safety of TB treatment.

Epidemiology of ventilator associated pneumonia; a matched case control study with incident cases

P2

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Introduction

Ventilator-associated pneumonia (VAP) a common infection in intensive care units (ICUs), and it is associated with increased healthcare costs. Our study are; to determine the rate and the risk factors of VAP in a Tunisian medical Intensive Care Unit (ICU).

Methods

An incident case control study performed in the adult medical ICU of "Farhat Hached" University hospital (Sousse-Tunisia) during 18 months from September 15th 2015 to 15th March 2017. Patients admitted longer than 48 hours and received mechanical ventilation via endotracheal intubation, for more than 48 hours, were enrolled for our study. Each case was matched to two controls on the basis of duration of intubation. Multivariate regression was used to identify VAP risk factors.

Results

Among the 258 admitted patients, 222 were under MV, and 45 cases were diagnosed. The density of incidence is 21.56 VAP/ 1000 days of MV. Multidrug-resistant *Acinetobacter baumannii* was the most implicated germ in VAP (64.4% of all isolated microorganisms). We successfully matched each case to 2 controls. Analysis retrieved that independent risk factors of VAP in ICU are the following; age (OR=1.038, 95% CI: [1.010-1.066], p=0.008), accidental extubation (OR=4.086, 95% CI: [1.041-16.041], p=0.044), and prolonged duration of sedation (OR= 1.150, 95% CI: [1.052-1.259], p=0.002). Protective factors are; invasive MV at admission (OR=0.364, 95% CI: [0.143-0.925], p=0.034), and non-invasive ventilation (OR=0.306, 95% CI: [0.118-0.794], p=0.015).

Conclusion

VAP constitutes a therapeutic challenge in ICU setting, therefore; strategies that effectively prevent VAP are needed.

P3 Investigation and control of multidrug resistant *Acinetobacter baumannii* outbreak in a medical intensive care unit

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Introduction

Multidrug-resistant *Acinetobacter baumannii* (MRAB) is an emerging cause of intensive care unit (ICU) outbreaks. Patients are the main reservoirs, inducing cross transmission. We describe an MRAB outbreak and its management in a Tunisian medical ICU.

Methods

Our department is an 8 bed medical ICU in a university hospital which is participating in an ongoing surveillance of nosocomial infections. The outbreak occurred from January to March 2016;

the MRAB positive patients were included in our study. We reviewed the carriers' files and enhanced infection control measures.

Results

A total of 14 patients were involved in this outbreak, they presented different hospital acquired infections caused by MRAB. Similar antibiotic resistant profiles showed that they were extensively drug-resistant strains, susceptible only to colistin. Thirteen patients died. The index patient was admitted in November 2015 and the outbreak started 2 months after his discharge. We dressed the epidemic curve and the synoptic table. Despite the non-recognition of outbreak source, a series of strategies were implemented to control the infections as follows: (1) separating infected patients into cohorts with special care; (2) giving optimized antimicrobial therapy; (3) strictly executing hand hygiene protocols by all medical staff; (4) extensive environmental decontamination, including floor, bed rails, tables, water taps, and sinks daily with 75% alcohol and sodium hypochlorite. No other case was observed in the ICU between March 11th and April 11th.

Conclusion

This study suggested the importance of thorough surveillance and disinfection of the environment, including concealed devices, in preventing the transmission of an outbreak.

P4 Results and impact of environmental investigation and hand swabbing in a medical intensive care unit

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Introduction

An effective surveillance system of healthcare associated infections (HAI) must identify priorities

for preventive interventions and improvement in quality of care. The aims of our study were to analyze the microbial flora of the staff hands, the antiseptic products as well as the healthcare environment (surfaces, bedding, medical devices...) in a medical intensive care unit (MICU).

Methods

In the framework of the nosocomial infection surveillance, we noted the increase of HAI rate occurring in the MICU occurring during July and August 2016. The majority of cases were caused by multidrug resistant bacteria. Hands swabbing was performed on 40 healthcare professionals, 13 liquid products were sampled, in addition to surfaces swabbing (bed rails, side tables, respiratory equipment, bedside monitors, keyboards, water taps) and passive air sampling procedure.

Results

We identified Coagulase Negative *Staphylococcus* spp., *Acinetobacter baumannii*, and *Pseudomonas aeruginosa* in the hand swabbing with a higher microbial population density within night shift nurses. *Acinetobacter baumannii* and *Escherichia coli* were identified in the aqueous eosin; *Klebsiella pneumoniae* was isolated in the methylene blue. *Aeromonas hydrophila* was found with a high microbial density in the liquid hand soap. *Staphylococcus* spp. and Gram negative bacilli were isolated in air sampling.

Our immediate actions were; to eliminate contaminated solutions, to perform an extensive environmental decontamination and to conduct a training and awareness program emphasizing on standard precautions and preventive actions.

Conclusion

The results of the sampling clearly reflect the team's hygiene procedures and behavior, and explain the relatively high rate of HAI.

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Introduction

Intensive care unit (ICU) patients are highly concerned by a risk of hospital acquired infections (HAIs). This is due to the seriousness of the treated pathologies, and more and more to invasive medical procedures.

Aims

To assess the rate and the risk factors of HAIs in a Tunisian medical ICU.

Materials and methods

This prospective study took place in an 8-bed adult medical ICU of a University Hospital (Sousse Tunisia), during 18 months from September 15th, 2015 to March 15th, 2017. All patients admitted for more than 48 hours were included in the study. HAIs were defined according to standard Centers for Disease Control and Prevention criteria. Risk factors were evaluated by a multivariate logistic regression model.

Results

A total of 258 patients were eligible for the study. Density of incidence of HAI is 27 infected patient/1000 days of hospitalization. Antimicrobial resistant bacteria were responsible of 40.6% of total HAIs. Ventilator Associated Pneumonia was the most frequently reported HAI (17.8%).

Multivariate analysis showed that independent risk factors of HAI were; age with an OR [95% CI]; 1.03[1.007-1.053], p=0.01, the transfer from another hospital department with an OR [95% CI]; 2.99[1.15-7.7], p= 0.024, a longer duration of sedation with an OR [95% CI]; 1.19[1.09-1.29], p<10⁻³.

However, a higher RAMSAY score was revealed protective; OR [95% CI]: 0.39[0.16-0.9], p= 0.031.

Conclusion

In addition to aged patients, those who are transferred from another hospital department and exposed to longer sedation are at higher risk of HAI.

P6 **Comparison of nosocomial vs. non-nosocomial hospital-associated diarrhea caused by *Clostridium difficile***

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Introduction/aims

Clostridium difficile infection (CDI) is recognised as one of the most significant hospital-associated (HA) infections worldwide. The aim of this study was to determine differences between patients with nosocomial (N) vs. non-nosocomial hospital-associated (nNHA)-CDI.

Methods

This retrospective observational study included inpatients with confirmed HA-CDI, in a teaching hospital in Croatia, from 2013-2016. N-CDI had onset of diarrhea >48h after hospital admission, and nNHA-CDI <48h after admission or community onset, in patients discharged from a hospital within previous four weeks. Demographic and clinical data were analysed. Length-of-hospital-stay after CDI (LOS), intensive care unit (ICU) treatment due to CDI and mortality rate were studied. Statistical analysis was performed.

Results

The analysis included 776 patients: 546 (70.4%) had HA-CDI, among them 170 (31.1%) having N-CDI and 376 (68.9%) nNHA-CDI. The range of N-CDI increased through observed years non-significantly (21.6-32.7%, $p=0.2440$). Groups were comparable by McCabe scores (mean: 1.58 vs. 1.55, $p=0.6227$). Patients with N-CDI had higher ATLAS scores (4.80 vs. 3.67, $p<0.0001$), were younger (median 68.1 vs. 72.3 y., $p=0.0075$), often diagnosed with first CDI episode (85.9 vs. 50.0%, $p<0.0001$), more often had severe complicated disease (18.8 vs. 10.4%, $p=0.0070$),

longer LOS (18.6 vs.13.3 days, $p=0.0003$), higher mortality rate (15.3 vs. 8.2%, $p=0.0126$), and higher independent risk for death (OR=0.4977; 95% CI, 0.29-0.87). ICU treatment (2.9 vs. 2.1%) was equally utilized between groups ($p=0.5680$).

Conclusions

Among observed HA-CDIs, N-CDI were less frequent, but associated with worse outcomes. Particular effort should be made in prevention of first CDI episode during in-hospital stay.

The use of UV fluorescent markers for monitoring cleaning and disinfection practices

P7

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It is recommended that the practices of housekeepers should be monitored. Besides methods such as visual inspection and microbial count, ATP bioluminescence assays and fluorescent marking systems have proven useful for evaluating cleaning practices. Compared with ATP bioluminescence assays, fluorescent marking systems are for the ongoing basis easier to use, have the advantage of being visible and are cheaper in use. On the other hand it is not always clear which type of marker and how to use them. The aim of this study is to determine how and for what specific purpose the different types of UV fluorescent marking systems can be used in the context of monitoring cleaning and disinfection practices. The first part describes the use of different markers and their domain of application. The second part compares the results of different cleaning and disinfection products on different types of surfaces. The methodology is based on the standardized method of the EN 16615 and a score index is used for quantification of the pictures of the remaining UV-traces after performing each test. The results of the 648 tests are evaluated by 2 independent researchers. Of the 4 different UV markers, the traces of the marker based on surfactants are most removed on all 3 surfaces by 5 different types of products with 4 types of cloths. Based on these results it is recommended to use UV markers based

on surfactants on smooth non-porous hydrophobic surfaces for evaluating cleaning practices with products and wipes with a cleaning ability.

P8 Antibiotic resistance and ability to form biofilm of coagulase negative staphylococci isolated from touch surfaces in hospital wards

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Introduction

Transfer of etiological factors of nosocomial infections through contact is one of the most important transfer route in hospital environment. The problem becomes particularly important in the case of multi-resistant organisms.

Aim

The aim of the study was characterization of coagulase-negative *Staphylococcus* spp. (CoNS) strains most frequently isolated from touch surfaces in hospital wards for their drug resistance and the ability of biofilm formation.

Material and method

The research material consisted of 48 CoNS strains isolated from different wards in multi-profiles, highly specialized hospital in Krakow, Poland. Identification of the species was carried out using MALDI-TOF MS system. Disk diffusion method according to the current EUCAST guidelines was used for testing antimicrobial susceptibility. PCR was used for detection of genes coding antimicrobial resistance. Isolates biofilm formation was screened using the method with Congo red agar.

Results

In the group of isolated CNS strains following species were identified: *Staphylococcus epidermidis*, *Staphylococcus haemolyticus*, *Staphylococcus hominis*, *Staphylococcus warnerii*, *Staphylococcus capitis*, *Staphylococcus simulans*, *Staphylococcus pettenkoferii*.

Almost 68% of the analyzed strains were methicillin-resistance. Resistance to other markers (macrolides, mupirocin, aminoglycosides) varied between 5 to 35%. Ability to form biofilm showed 26% of the isolates.

Conclusion

CoNS isolated from touch surfaces showed high resistance to methicillin and moderate resistance to other antibiotics. The results of the study confirm that cleaning and disinfecting procedures in hospital wards should be performed according to recommendation and carefully monitored.

The study was done as a part of the Jagiellonian University Medical College project no. K/ZDS/007040.

P9 Drug resistance and virulence of *Pseudomonas aeruginosa* strains isolated from skin and soft tissue infections

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Skin and soft tissue infection (SSTI) is the most common infection which physicians meet in their practice and *P. aeruginosa* (PAR) is one of the most important etiologic factor of SSTI. The aim of the study was to analyze the drug resistance and virulence of PAR isolated from Polish patients.

Drug resistance was examined in accordance with the EUCAST. The virulence genes were detected by PCR, the ability of motion was investigated on the semi-solid agar and the ability to slime formation was tested on Congo red agar.

There were 111 PAR strains, including 84 from hospital patients (62 from surgical ward) and 27 from outpatients. Patients were from 48 to 92 years old, median was 70.

PAR strains were classified into the groups: susceptible (61.3%), multi-drug resistant (19.8%)

and extensively-drug resistant (18.9%). The most strains were resistant to levofloxacin (42%) and the least to colistin (1.8%). Among the detected virulence genes, the *exoT* and *exoY* genes were most frequent (97.3% and 91.9%), the *phzM* gene (8.1%) and *pilB* (7.2%) were the least frequent. Most virulence genes (7 out of 9) were showed in strains isolated from the oldest patients. There was no correlation between the number of virulence genes and the type of resistance. 98% of the strains showed the ability to move, the ability to slime production showed 1/3 of the strains.

Increased virulence of the PAR strains which has been demonstrated in older patients may indicate increased susceptibility to infection with this etiology due to deteriorated skin condition, comorbidities, weakened immunity.

P10 **Necrotizing fasciitis after the hystrectomy in a previously healthy woman caused by invasive *S. agalactiae* – a case report**

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Necrotizing fasciitis is a severe soft-tissue infection which can be affected by *Streptococcus agalactiae* (GBS). We herein report a case of GBS infection in a 50-year-old, previously healthy woman after a total hysterectomy procedure. The patient was readmitted to the hospital in the 7th day after surgery with a necrotic surgical side infection. Microbiological samples were collected and GBS was identified as a pathogenic factor, however also *Peptostreptococcus anaerobius*, *Mobiluncus mulieris* and *Prevotella melaninogenica* were present to a small extent. According to EUCAST guidelines isolated demonstrated cMLS_B resistance phenotype. A clinical isolate had been characterized by numerous typing methods, such as molecular serotyping, protein gene profiling and multilocus

sequence typing (MLST). In an MLST analysis result, the tested GBS strain represented the sequencing type ST-28 (clonal complex CC-19). According to the PCR method, the analyzed isolate belonged to serotype II, and coded rib gene. Aside from the invasive infection, the woman also developed an abscess in the lumbar region. The treatment consisted of surgical debridement, incision, drainage, hyperbaric therapy as well as a combination of the following antibiotic courses: amoxicillin/clavunalic acid and genatymicin. Previously administered doses of clindamycin and tigecycline were discontinued after drug sensitivity tests. The patient made a full recovery. A described infection was the second episode of postsurgical complications in this patient, after the first, which occurred in 2011. Thus it is worth to consider whether GBS screening before gynecological procedures in patients in risk groups, previously infected with a given pathogen, should be a standard.

Microbiological contamination of new sinks in an intensive care unit

P11

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Introduction

Contaminated drains are known sources of pathogens in hospitals. Particularly, drains in patient rooms can be linked to nosocomial infections or outbreaks with multidrug-resistant pathogens.

Material and methods

To determine the contamination of the drains in a “real life szenario” in an intensive care unit (ICU), the syphons were removed, replaced and sampled and replaced according to a protocol. After 12 weeks, the examination was repeated. In total, 102 samples were taken from 17 wash basins (6 samples per syphon).

Results

Before the replacement of the syphons, multidrug-resistant Gram-negative bacteria were detected in 18 samples (10 drains). Twelve weeks after the

exchange, four syphons were already contaminated with multidrug-resistant Gram-negative bacteria, three of them on the wall mounting.

Conclusions

Our study shows that the entire wastewater system of washbasins may be contaminated with multidrug-resistant bacteria. Replacement of the basins and the implementation of new syphons seems not to be the way to solve the problem. In our study, the drains were recontaminated in a short time period retrogradely. A bundle of measures is necessary to prevent nosocomial infections associated to the wastewater system, eg. washbasins without porcelator, prevention of aerosolization, using separate sinks for handwashing and disposal of contaminated fluids, etc.

P12 Biofilm production in patients with urinary tract bacterial infection associated with urinary catheterization

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Introduction

Microbial biofilms pose a public health problem for patients with urinary tract infection (UTI) with indwelling medical devices.

Aim

The present study was conducted the relation between biofilm production, catheterization and resistance to the antibiotics commonly used in treating UTI.

Material and methods

This study included 100 urine samples from patients admitted at New Damietta University Hospital, suffering from UTIs. They divided into: 50 patients with urinary catheter (group 1) at least 2 days and 50 non catheterized patients (group 2), who are

randomly selected from patients with suspected clinical signs of UTI. Detection of biofilm formation by isolated organisms was done using Congo red agar method.

Results

Urine cultures were positive in 45 (90%) patients of group 1 and in 28 (56.0%) patients of group 2. *Escherichia coli* in 22 (48.9%) and 11 (39.3%), followed by *Klebsiella pneumoniae* in 10 (22.2%) and 6 (21.4%), *Staphylococcus aureus* in 8 (17.8%) and 3 (10.7%), and *Pseudomonas aeruginosa* in 5 (11.1%) and 8 (28.6%) ($\chi^2 = 3.88$, P-value = 0.274). Biofilm was more significantly formed in group 1 (37/45, 82.2%) than group 2 (17/28, 60.7%) ($\chi^2 = 4.15$, P = 0.042). Again biofilm formation was more with *E. coli* followed by *K. pneumoniae*, *S. aureus* and *P. aeruginosa*. Antibiotic resistance was more detected in biofilm producers than non biofilm ones.

Conclusion

This study indicates that that urinary catheter represents a risk factor in the biofilm formation particularly with *E. coli*. Biofilm formation also has a major role in resistance to antibiotic used against the isolated organisms.

P13 Evaluation of hydergen peroxide and silver cations vs active chloride disinfection procedures for eradication of multidrug-resistant organisms

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Background

Environmental persistence of MDROs in hospital environment and fomites is a widely diffused and persistent problem. Partial ineffectiveness and inefficiencies intrinsic into manual disinfection heighten contamination and infection risk.

Objective

Study evaluated a new no-touch disinfection technology called HyperDRYMist®, which decontaminates surfaces by micro-nebulizing hydrogen peroxide, as an alternative to manual disinfection.

Materials/methods

Surface contamination measured after patient's discharge on 10 high-touch points in 20 rooms occupied by MDROs affected patients.

Measurements taken after manual disinfection with active chlorine (2000 ppm), before and after HDM® treatment.

Results

For 8 months, prospectively identified and included 20 cases of "classical MDROs" patients. After final cleaning, the residual bacterial contamination was 59.27 ± 78.89 (mean \pm DS) cfu / ml, with values reaching 400 cfu / ml, then reduced to 2.48 ± 12.07 ($p < 0.0001$) after HDM. In rooms occupied by MDRO infected/colonized patient, MDROs isolated via swabbing. In 14/20 rooms MDR bacteria still found after conventional disinfection, in particular MRSA found in 4/4 rooms. *Acinetobacter baumannii* in 2/2, MDR *Pseudomonas* spp. in 2/2, KPC in 2/4, VRE in 0/2, *E. coli* ESBL 2/2, *K. pneumonia* ESBL 0/2, *Stenotrophomonas maltophilia* 2/2. After HDM® no MDR-contaminated surfaces detected.

Conclusion

The study confirms presence of significant environmental contamination levels even after manual disinfection. The persistence of MDROs in the rooms suggests that surfaces can play a key role in transmitting HAI. HDM® drastically reduced MDRO's presence, hence beneficial role played by this novel environmental disinfection technology.

P14 Chasing zero CLABSI: a multidisciplinary approach

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Introduction

Central line associated bloodstream infections (CLABSI) are one of the most common healthcare-associated infections in the healthcare settings which are preventable. Central lines are commonly used for critical patients to administer fluids and medications. The presence of central line is a significant risk factor for developing bloodstream infection which is associated with increased risk of mortality and increase healthcare costs. Our CLABSI rates in coronary intensive care unit were consistently high for 5 years despite the implementation of infection control strategies to reduce the infections.

Aims

Reduction of CLABSI rates of 3.1 to < 0.8 NHSN benchmark with the ultimate goal of achieving zero CLABSI rates by the end of December 2017.

Interventions

A quality improvement initiative "STOP CLABSI Project" was organized with collaborative efforts of a multidisciplinary team to education and train physicians and nurses for central line insertion and maintenance bundle and strict implementation of infection control and evidence-based practices for preventing CLABSI.

Results

Our CLABSI rates in 2012 to 2016 were high above the NHSN 50th percentile (0.8) with 25 infections. We achieved zero CLABSI rates for 386 calendar days with strict implementation and compliance with CLABSI preventive measures.

Conclusions

The implementation of evidence-based practices for preventing CLABSI, training of staffs for central line insertion and maintenance bundle, staff dedication, commitment, strong leadership support, teamwork, process ownership and proactive approach to make a change contributed towards the success of achieving zero tolerance infection rates.

P15 **Microfluidic approach to MRSA detection:
15 minutes from sample to results**

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Staphylococcus aureus is the leading cause of hospital-acquired infections, primary cause of lower respiratory tract and surgical infections. Here we present an innovative system for ultrafast and complex MRSA detection using microfluidic real-time PCR.

The new technology due to its speed, reliability and sensitivity is an important step in development of rapid point of care tests (PoCT) performed during admission to the hospital or at doctor's office.

We will report the research on PCR that uses disposable microfluidic cartridges and electromagnetic radiation for heating. Our method allows for up to 64 different PCR reactions from a sample, allowing to identify multiple pathogens within a few minutes. We report cycle times of 8-12 seconds with uniform conditions for all the reactions and single molecule sensitivity. We will also report the research on clinical panels for detection of multiple pathogens.

We will discuss the results of studies on a panel designed to detect MRSA from DNA isolated from patient samples. Our method allows to reliably detect three different *Staphylococcus aureus* genes (Eap, MecA, MecC) and an internal positive control, all in quadruplicates with the complete procedure performed within 8 minutes. We will also report the development of a fully integrated PoCT device which will be able not only to perform real-time PCR reactions, but also to automatically isolate DNA from swabs. The whole diagnostic process - from swab to results will take as little as 15 minutes.

Bacteromic – the use of microfluidic technologies for comprehensive antibiotic susceptibility testing

P16

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Introduction/aims

As new antibiotics are developed much slower than pathogens' resistance, one of the most important strategies in combating antibiotic resistance in more conscious and more effective use of antibiotics. This requires faster and more accurate diagnostics systems.

Here we demonstrate the use of microfluidic technologies to develop an automated diagnostic system that will deliver revolutionarily more information than is currently available in existing solutions.

Interventions

We designed and build prototype device for automatic antibiotic susceptibility testing based on highly parallel culturing in hundreds of micro chambers on disposable microfluidic cartridges. This system allows to test susceptibility to many antimicrobial agents in wide range of concentrations, using two-fold dilutions, which is required to obtain true MIC value. It also includes combinations of antibiotics that are often the last resort treatment in the most difficult infections.

Four reference strains had been chosen for pilot study: *E. coli* (ATCC 25922), *S. aureus* (ATCC 29213), *E. faecalis* (ATCC 29212) and *P. aeruginosa* (ATCC 27853). MIC values for several antimicrobial agents, i.e. ampicillin, gentamicin, vancomycin and ceftazidime were calculated using our device and then compared to EUCAST MIC values.

Results

For all tested reference strains, MIC values obtained using our AST system corresponded with those provided by EUCAST. In most cases, presence or absence of growth were observed after few hours.

Conclusions

Thanks to designed AST system, we will be able to calculate MIC values for many antibiotics faster and more accurately than with any other method available.

P17 Nosocomial infections in neonatology - Case control study about 184 cases

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Introduction

Nosocomial neonatal infections are a major public health problem due to their frequency, morbidity and mortality. Before setting up a strategy of prevention and control, it is essential to know the risk factors.

Aims

1. Describe the epidemiological profile of newborn infants who had a nosocomial infection.
2. Describe the clinical and progressive characteristics of nosocomial infections and determine the risk factors involved.

Methods

Retrospective case-control study conducted over a period of three years, from January 2013 to December 2015, in the neonatal unit of CHU IBN Jazzar Kairouan. Our study population is consisting of 184 cases and 184 controls.

Results

Sepsis was the most frequent nosocomial infection (72 cases or 39.1%), followed by clinical sepsis without bacteriological confirmation (69 cases or 37.5%) and pneumonia (36 cases or 19.6%). The main risk factors independently associated with the risk of a nosocomial infection were: length of hospital stay (OR=1.10; CI=1.05-1.14), mechanical ventilation (OR=4.26; CI= 1.74-10.40), central venous catheterization (CVC) (OR=3.82; CI=1.51-9.67), antacid (OR=2.19; CI=1.11-4.29) and continuous enteral nutrition (OR=2.50; CI=1.19-5.24).

Conclusion

Long regarded as the price to pay for hospitalization, nosocomial infections remain a major public health problem because of their high morbidity and the extra costs they generate, particularly in neonatology.

P18 Differences in mortality rates attributable to different levels of antimicrobial resistant *Acinetobacter baumannii* bacteremia

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Introduction

We conducted a study to determine whether there is a clue that multidrug resistant *Acinetobacter baumannii* has regained virulence.

Methods

Microbiology data and information of the adult patients admitted to Songklanagarind Hospital with positive blood culture for AB during January 2008 and April 2017 were retrieved and reviewed. Antimicrobial resistance was classified into four categories comprising non-multidrug-resistant (nMDR), multidrug-resistant (MDR), extensively-drug-resistant (XDR), and possible-pandrug-resistant (pPDR). The primary outcome of bacteremia was in hospital mortality rate. The differences in mortality rates were assessed by Cox proportional hazard model. Results of analysis were reported in term of hazard ratio (HR) and corresponding 95% confidence interval (95% C.I).

Results

The study identified 480 patients with hospital-acquired *Acinetobacter baumannii* bacteremia. The proportions among resistance categories were 11%, 39%, 42% and 3% with crude mortality rates of 21%, 34%, 70%, and 71% for nMDR, MDR, XDR, and pPDR respectively. We found positive interaction between level of drug resistance and appropriateness of antimicrobial treatment. Among the appropriate

treatment group, the mortality HRs and 95%CI for MDR, and XDR were 1.7 (0.8 – 3.4), and 2.0 (0.9 – 4.1), respectively compared to nMDR. Among the inappropriate treatment group, the adjusted HRs for nMDR, MDR, XDR, and pPDR were 2.3 (0.5 – 10.6), 3.2 (1.4 – 7.3), 8.1 (4.0 – 16.2), and 4.4 (1.8 – 11.2) respectively compared to appropriate treated nMDR.

Conclusions

There is a clue that some multidrug resistant strains of AB had already mutated to compensate the fitness cost, and regained the bacterial virulence.

P19 Isolation precautions: knowledge and perceptions / opinions of healthcare workers of an emergency department

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Introduction

Isolation precautions are essential for preventing the transmission of microorganisms in the emergency department (ED).

Objective

To assess the knowledge of healthcare workers (HCW) on isolation precautions and explore their perceptions/opinions on the subject.

Method

A mixed, pragmatic and sequential method of research was carried out in two phases, from August to October 2016, in an ED in Rio de Janeiro, Brazil. In phase-I (PI), a validated questionnaire (29 questions divided into five thematic axes) was applied to all professionals in order to evaluate their knowledge on isolation precautions, and the analytical tests

were applied to identify factors associated to correct answers. In phase-II (PII), a focus group was carried out with selected HCW to explore their perceptions/opinions of isolation precautions compliance and the data were analyzed utilizing thematic content analysis and the Health Belief Model (HBM).

Results

HCW (n=30) answered correctly in 49.8% of the questions. Physicians and physical therapists had a higher number of correct answers than the nursing staff. The time elapsed after graduating (< 11 years; p=0.009) and the higher degrees (p=0.002) were associated with the higher number of correct answers. Patient accommodation, in-hospital transport, and personal protective equipment showed the least correct answers. The focus group (n=7) revealed: low perception of risk of infection susceptibility and severity as well as few benefits of isolation precautions; and individual, organizational and institutional factors as barriers.

Conclusion

Low knowledge on isolation precautions and the risk factors for isolation precaution compliance were identified in the ED.

P20 Analysis of chosen adverse events, including hospital infections, as an item of risk management process in multispeciality hospital

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Presentation is a case study of chosen adverse events, which are representative examples of clinical situations followed by compensation proceeding. Author have concentrated on analysis of clinical and organizational processes fulfilled in hospital, not just civil law aspects. First case concerns 31-year-old patient Christina H., who in 2010 had her breast surgically enlarged. After operation, patient did not wake up after general anaesthesia, and because of undiagnosed breath depression, oxygen deficiency

of central nervous system occurs, followed by its malfunction. Due to it, patient has been in "locked-in". It is impossible to contact with her in conscious way. Compensation proposal oscillates around 6,000,000 zloty. Second case concerns 34-year-old patient on obstetric ward. In 2016 patient came on pathology of pregnancy ward and she gave birth to healthy daughter in 41 week of pregnancy. After labour massive bleeding from reproductive organs occurred, and urgent procedure of surgical operation because of death risk was implemented. Lasting many hours, surgical operation was succeeded (total blood loss 3500 ml) – patient was rescued and uterus was saved. During operation surgical cloth was left in abdominal cavity. It was removed after 7 months. Conciliatory proceeding in progress. Third of presented case concerns 70-year-old patient affected by many illnesses, who died because of multiorgan deficiency 3 months after knee endoprosthesis. Proposal of 300,000 zloty compensation was submitted against hospital on grounds of resulting in many pathogen infection followed by patient's death.

P21 Attitudes and habits concerning stethoscopes and hand hygiene among Polish medical students – a questionnaire study

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Introduction/Aims

Healthcare-associated infections (HAI) are a huge problem in medicine nowadays. Contaminated stethoscopes and medical personnel's hands may be vectors of microorganisms and become a source of nosocomial infections. The aim was to identify the habits and attitudes to stethoscopes and hand hygiene among Polish medical students.

Methods

568 third- to sixth-year students from different medical universities in Poland completed an anonymous original online questionnaire consisting of 25 questions.

Results

42.4% of students cleaned their stethoscopes after each patient examination, 23.4% did it at least once a day, 22.5% once a week and 11.7% rarer or never. The most commonly cleaned areas of the stethoscope were diaphragm (93.4%) and bell (74.6%), while ear tips (11.3%) and metal tubing (10.6%) were the least frequently disinfected parts. Using alcohol gel designed for washing hands was the most popular method of cleaning the stethoscopes (86%). 76% of students were not interested in gaining knowledge about stethoscope hygiene. 96.1% of students declared they washed their hands after each patient, 3.4% at least once a day, 0.2% once a week and 0.3% never. A positive correlation was observed between a higher year of studies and better knowledge about pathogens causing nosocomial infections and antibiotic-resistant strains of bacteria.

Conclusions

Higher-year students have greater knowledge and skills concerning hand and stethoscope disinfection.

Clinical and epidemiological aspects of LRVREF - resistant *Enterococcus faecium* strains isolated from haematological patients in one hospital

P22

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One of the emerging problems of enterococci infections is resistance to linezolid, antibiotic used in the vancomycin-resistant strains (VRE) caused infections.

The main objective of our research was to investigate the relationship between strains of linezolid-resistant *E. faecium*, isolated from 16 patients hospitalized in the Haematological Unit of the Clinical Hospital in Poland from 2013-2017 using PCR MP and RAPD methods.

The genetic profiles of tested strains were also compared with profile of LRVREF strain isolated for the first time in the UCK in 2003 (at the same hospital unit). There were no genetic similarity between them, suggesting that strain from 2003 have been effectively eliminated from the hospital environment. In addition to the classical methods (disk diffusion test), resistance to linezolid was confirmed by detecting mutations G2576U of subunit 23S rRNA. The study was conducted by genetic methods such as PCR - RFLP, allele-specific PCR, and using the technique of real-time PCR. All the techniques confirmed the presence of this point mutation, moreover we have found their presence in the heterozygous arrangement.

P23 *Escherichia coli* as an etiological agent in sepsis of newborn - genetic analysis of strains

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Background

Sepsis remains one of the leading causes of morbidity and mortality in newborns and preterm infants (EOS). Risk factors for early-onset neonatal sepsis include both infant and maternal factors. *E. coli* is the second leading pathogen causing EOS in neonates.

Methods

Clinical samples from 11 newborns with sepsis of Neonatology Department at the University Hospital

in Gdańsk were examined for the presence of *E. coli* isolates. We tested 50 isolates from clinical materials (blood, urine, throat, anal swab, stool, ear). In two cases, samples have been taken from mothers (isolates from vaginal, wounds, stools and urethra). *E. coli* isolates were tested for the virulence factors (Vf: papC, *sfa*, *cnf1*, *usp*, *fimH*, *hlyA*, *afa/Dr*, *agn43*) by PCR method. *E. coli* isolates from newborns and the mothers were chosen for further examination by molecular typing methods.

Results

The most frequently identified virulence factors were: Usp bacteriocin, P-type fimbriae, S-type fimbriae, Agn43 - outer membrane protein. In six patients *E. coli* with type Dr fimbriae has been diagnosed. Eight patients were found to have closely related *E. coli* strains isolated in the blood and gastrointestinal tract. Two newborns had identical *E. coli* genotypes as those isolated from their mother.

Conclusion

The results of our examination suggested that *E. coli* can be potential risk factors for newborns, especially in low birth weight infants and preterm babies. The virulence factors of *E. coli* can induce translocation to inner tissues. The mothers and their environment should be monitored for the pathogenic *E. coli* strains.

About some aspects of the reactivation of varicella zoster in infants

P24

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Herpes infections are the most dangerous for pregnant women and chicken pox is no exception, especially when the mother is infected first. There are 3 forms of varicella zoster in newborns: fetal,

congenital, postnatal. The fetal form is rare and makes 1.6-4.6 cases per 1000 live born. The fetal syndrome is a case example from a clinical practice. A venerable newborn from a mother who had suffered chicken pox at the 16-18th week of pregnancy was born with cicatricial changes on the skin and lesions of the eyes (chorioretinitis). The specification was confirmed by the detection of DNK pathogen and immune markers (anti-VZVIgG, IgM). Antiviral chemotherapy was performed with acyclovir for the purpose of long (up to 6 months) immunosuppression. Early diagnosis and timely chemotherapy made it possible to establish control over local lesions. At 10 months of age, a profuse vesicular rash appeared on the uterus of the child on an erythematous background, sometimes merging into multi-chambered blisters, with their subsequent opening and exposure of erosive surfaces accompanied by severe itching. Laboratory tests revealed the criteria for the activity of herpes zoster (PCR contents of vesicles - positive, diagnostic titer anti-VZV IgM). This indicates a reactivation of the virus in a child who underwent fetal varicella syndrome in the form of a clinical picture of herpes zoster in early infancy, as evidenced by the detection of persistent anti-VZV IgG after 7 months of age.

P25 **Analysis of costs of antibiotic therapy implemented in University Hospital No. 2 in Bydgoszcz in 2014-2016**

Arkadiusz Kuziemski

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Since 2008, the hospital antibiotic policy has divided access to antibiotics into unrestricted groups (prevention, empirical therapy) and a restricted group (administratively restricted access). Since 2008, the cost of antibiotics as a percentage of antibiotics in the budget of medicines (excluding drug programs) has reached about 10%. In the years 2014-2016 costs were analyzed in groups. The risk of antibiotic abuse in empirical therapy was assessed.

Analysis of annual costs of antibiotic therapy according to access groups.

The study covered the cost of antibiotics from the years 2014 - 2016. According to the principles of rational antibiotic therapy in force in UH No. 2 in Bydgoszcz since 2008. Antibiotics are divided into four groups. Groups I, II, III include periprocedural prophylaxis and empirical therapy. Group IV includes antibiotics to which access is administratively limited.

In the years 2014-2016 the cost of antibiotics from empirical groups decreased from 644,861.20 to 542,811.10. The costs of antibiotics in proprietary groups ranged from 754,640.88 to 889,934.62. Their share in the total cost of antibiotics was respectively 2014 - 53.92%, 2015 - 59.97% and 2016 - 62.11%. The difference in costs was 2014 -109,779.68, 2015 - 279,649.38 and 2016 - 347,123.52, respectively.

Conclusions

1. Administrative limitation of access to antibiotics has not increased the costs in antibiotic groups available without restriction.
2. Costs of restricted antibiotics was dominated by antibiotics used in empirical therapy.

Clinical characteristics of hospital infections registered in the years 2012-2016 in University Hospital No. 2 in Bydgoszcz

P26

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Monitoring of the number of clinical signs of hospital infections is an important part of the epidemiological situation of the hospital. A sudden increase in the number of recorded cases of the same clinical form is a signal indicating the possibility of negligence in hospital hygiene. The results of the analysis of clinical characteristics were compared with results of the PPS HAI & AU study from 2013-2015.

The aim of the study was to analyze the clinical characteristics of hospital infections registered in the years 2012-2016 at the University Hospital No. 2 in Bydgoszcz and compare the analysis with the results obtained in the PPS HAI & AU study.

The study included hospital-acquired registries for the years 2012-2016 (a total of 3766 cases were recorded in this period), and a summary of clinical findings from the PPS HAI & AU study in 2014-2016.

Types of clinical forms were classified according to division into systemic and organ infection. Year-on-year percentages of clinical infections in hospitals and in individual departments were compared. Particular attention was paid to the statistics in the departments with the highest risk of hospital infections.

Respiratory tract infections (RTIs), urinary tract infections (UTIs), blood infections (BI) and surgical site infections (SSIs) were dominant in our study (83.53%), the result was comparable to the proportion of these four clinical forms PPS HAI & AU study (88.05%). Trend analysis showed year-on-year increase in UTI cases, especially in the neurology department. Corrective action taken in 2016 by the Hospital Infectious Disease Control Team in collaboration with the department's management resulted in a significant decrease in registered hospital infections (approximately 60%) in the first half of 2017 compared to the first half of 2016.

Conclusions

1. An analysis of the upward trend of recorded clinical forms reveals the negligence of staff when it comes to respect the standards of hospital hygiene;
2. Based on the results of the PPS HAI & AU study, trends cannot be assessed, but the most common clinical forms of infection can be identified.

P27 Etiology of hospital infections registered in University Hospital No. 2 in Bydgoszcz in 2015-2016

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The etiology of hospital infections is the subject of analyzes of the hospital infection control teams. In particular, hospital-acquired infections caused by alert microorganisms are subject to rigorous epidemiological investigations. Their high share in

the total number of recognized hospital infections is a sign that: the hospital's epidemiological situation is poor, there is a selective antibiotic treatment for resistant strains and there are possible errors in compliance with hospital hygiene, especially in terms of patient isolation.

The aim of the study was to analyze the etiology of hospital infections registered in the years 2015-2016 in University Hospital No. 2 in Bydgoszcz.

The study covered the records of hospital infections from 2015-2016. In total, 1771 cases of hospital infections were registered. Infections were divided into alarm-induced microorganisms and others. In addition, microbiological maps of the hospital from 2014-2016 were analyzed.

In 2015, out of 770 hospital infections 212 were caused by alarm microorganisms. In 2016, out of 1001 hospital infections, 272 were caused by alarm microorganisms. The percentage of alarm microorganisms in both analyzed years was 27%. Microbiological maps have shown increased isolation of *Enterobacteriaceae* strains with ESBL resistance from 251 in 2014 to 419 in 2016. Among hospital infections in 2015, 126 (59.43%) were of this aetiology, and 172 (63%) in 2016.

Conclusions

1. Comparing year to year percentage of alarm microorganisms in hospital infections remains at the same level.
2. Dominance among hospital infections (approximately 60% year-on-year) of the etiology of *Enterobacteriaceae* strains with ESBL resistance is coincident with the results of microbiological mapping (isolates from clinically relevant materials without repetition).

P28 How to improve antibiotic prescription? Barriers and suggested antibiotic stewardship interventions in two Portuguese hospitals

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Introduction

Antimicrobial resistance is one major worldwide problem frequently associated with antibiotics overuse and incorrect prescription. In Portugal, antibiotic consumption is still higher than European average, (45.6% vs 35.8% of hospitalized patients received antibiotics). Since physicians play an important role on antibiotic use and prescription, understanding their antibiotic prescribing habits is paramount. The aim of this study was to identify barriers in antibiotic prescription process, in two Portuguese hospitals, in order to design and implement effective antibiotic stewardship interventions.

Methodology

The study was conducted under the scope of HAITool project (European Economic Area Grants) - A Toolkit to Prevent, Manage and Control Healthcare-Associated Infections in Portugal. A self-administered questionnaire was distributed to 60 physicians in two Portuguese hospitals in 2016.

Main Results

Close to one third of physicians described "lack of (or delayed) microbiology results" as major barrier for antibiotic prescription. "Education and training" was suggested as the most effective strategy to improve antibiotic prescription. However, lack of organization and proper information systems also emerged as important factors.

Conclusion

In order to reduce the barriers, felt by participant physicians on antibiotic prescription process, we suggest antibiotic stewardship interventions based on the following key points:

1. education on the antibiotic resistance problem;
2. an easier access to microbiology results and local epidemiological data (e.g. information system);
3. development of easy and accessible antimicrobial prescribing guidelines adapted to hospital epidemiology.

Proposal of *Pseudomonas aeruginosa* ESBL-positive strains new detection scheme

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Introduction

The knowledge of the prevalence of ESBL enzymes among *P. aeruginosa* strains compared to *Enterobacteriaceae* is limited. The phenotypic tests recommended by EUCAST and CLSI for the detection of ESBL-producing *Enterobacteriaceae* are not always suited for *P. aeruginosa* strains. The *P. aeruginosa* strains produce different families of ESBLs than *Enterobacteriaceae*. Furthermore, some ES-OXAs commonly found in *P. aeruginosa*, are less well inhibited by the known β -lactamase inhibitors than ESBLs from class A. Beside, the level of AmpC production by *P. aeruginosa* may interfere with or even hide the detection of ESBLs by phenotypic tests.

Methods

In this study I proposed an original procedure for the searching for *P. aeruginosa* ESBL-positive strains: using currently available phenotypic tests, their modifications and multiplex PCR.

Results

The ESBL-type enzymes production was detected in 110 out of 720 isolates (15%) in at least one of the phenotypic DDS-tests. The largest number of ESBL-positive isolates (n=92) was found using DDS-SAM (with sulbactam). Finally, I propose to use three methods (with clavulanic, sulbactam and imipenem) to detect ESBL-producing *P. aeruginosa* strains. Depending on the images of the plates, I suggest a reduction in the distance between antibiotics discs to 15 mm and the addition of boronic acid at 0.4 mg per disc.

Conclusion

This study demonstrate the effectiveness of the proposed methods in the detection of the various ESBLs, as VEB, GES, OXA-2 and OXA-10 families, which commonly occurred among *P. aeruginosa*, also with the high level of AmpC production.

P30 **A complementary tool to validate surgical site infection surveillance data (VINCat Program, Catalonia, Spain)**

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Background

Validation is considered an essential issue in order to establish data consistency. However, comprehensive validation systems are usually costly and time-consuming.

Objective

To further evaluate the compliance and reliability of SSI data submitted by using a complementary tool.

Methods

The VINCat is a surveillance program of HCAI in Catalonia (Spain), based in CDC's NHSN definitions. In addition to standard evaluations of structure, protocols and coherence of data, we validated inclusion of cases and concordance with SSI diagnosis, for elective colorectal surgery and elective knee replacement, in those hospitals with SSI rates below percentile 25. Agreement between external investigators and data of SSI collected by local teams was assessed by reviewing a sample of randomly selected electronic charts.

Results

1. Colorectal surgery (8 hospitals with infection rates below 14.5%): The agreement regarding inclusion (89 cases) was low, 0.32 Kappa index (IC95% 0.05-0.60) and regarding SSI diagnosis (241 cases) was high 0.77 Kappa index (IC95% 0.64-0.89).
2. Knee prosthesis (4 with infection rates below 1.6%): The agreement regarding inclusion (163

cases) was moderate, 0.0 Kappa index (IC95%: -0.6-0.6) and SSI diagnosis (121 cases) was good, 0.74 Kappa index (IC95% -1.01-2.63).

Conclusions

On-site visits focused on hospitals suspicious of underreporting allowed determining frequent gaps in the inclusion of patients. Misclassification of type of SSI (superficial, deep or organ/space) was observed in knee procedures, particularly for deep incisional versus organ/space. Surveillance focusing hospitals with rates below percentile 25 appears to be an effective and sustainable tool.

Hospital acquired infection: case study of a 51 year old man admitted to intensive care unit **P31**

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Introduction

When patients are admitted in hospital it is expected that they will go home in a healthy condition however, this does not always happen.

I am presenting a case of a 51 year old male patient who was admitted with a diagnosis of acute abdomen in May 2017. The patient was operated; repair of spontaneous perforation was done and then transferred to intensive care unit (ICU). Four days post-operative the patient had abdominal distention, vomiting and a laparotomy was done. The patient's condition however deteriorated further and a tracheostomy was done. Culture results showed; *Enterobacter cloacae* and *Klebsiella pneumoniae* in both pus and sputum specimen and *E. coli* in the tracheal aspirate. Patient died three months after hospitalization.

The hospital management team assessed the possible contributing risk factors and it was noted that infection prevention and control (IPC) measures were not fully adhered to by ICU staff.

Interventions

Intensive training on IPC practices including; proper

hand hygiene technique, the five moments of hand hygiene, suctioning techniques and environmental cleaning was done among others.

Results

Before training, staff at ICU were observed not to fully comply with the recommended IPC practices for hand hygiene and suctioning. Post training audit however showed full compliance.

Conclusion

Hospital acquired infections (HAI) are a significant cause of morbidity and mortality in healthcare facilities. Continuous training and monitoring of IPC practices of healthcare workers to ensure they always adhere to IPC practices is therefore critical in preventing HAI.

main predisposing factors were: type of the medical act (92.6%), duration of that act (69.6%) and the emergency in doing it (67%).

Occurrence mechanisms were related to bites in 90.09%. The victims of BEA are significantly more, aware of its risks (96.39% vs 81.53%; $p=0.002$), when investigating the medical act's nature as predisposing factor and the depth of the wound as aggravating factor (respectively 98.19% vs 83.07%; $P<10^{-4}$ and 93.7% vs 67.69%; $P<10^{-4}$).

P32 Blood exposure accidents among intern trainees in medicine: from analysis to action

Mohamed Mahjoub, Rym Bouriga, Sihem Zenaidi, Mansour Njah

University Hospital Farhat Hached, Sousse, Tunisia

Blood exposure accidents (BEA) are severe professional accidents where non experimented interns represent a high risk group. BEA monitoring is one of the pillars of strategies for risks management in healthcare. The objective was to determine the situation of young medical trainees with BEA at the Tunisian university hospital in the prospect of improving their management practice.

We led a descriptive cross-sectional study of 2 months in 2017 including all intern trainees, at the university hospital Farhat Hached. A pre-established, pre-tested and self administered questionnaire was used. Data seizure and analysis were made by the SPSS software v18.0.

Response rate was 80% (176/220). Updated vaccination status was reported in 70.5% of cases. One hundred and eleven trainees (63.07%) declared themselves to be victims of BEA. The

P33 Blood exposure accidents among resident surgeons

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Introduction

Accidental blood exposure (ABE) is frequent among surgeons and yet more among resident surgeons which may cause severe consequences.

Objectives

Our aim was to assess resident surgeon's knowledge, attitudes and practices related to ABE in the operating rooms of a Tunisian hospital.

Methods

This cross sectional study was conducted in the four operating rooms of a tertiary care Tunisian hospital between June and November 2017. All in training surgeons of the hospital were included. A self-administrated questionnaire was used to collect data about knowledge, attitudes and practices related to ABE.

Results

The prevalence of ABE was 76%. The higher prevalence was reported in gynaecology (86%) followed by general surgery (80%) then ophthalmology (60%) and finally otorhinolaryngology (59%) ($p=0.048$).

Gynaecologists residents were the most underestimating the double gloving protective role during interventions (29.6%) compared to residents

from the general surgery (16.6%), ophthalmology (16.2%) and otorhinolaryngology (0%). While this difference was not statistically significant ($p=0.27$) compared to the other resident surgeons, gynaecologists residents were requesting serology for themselves after ABE (50% versus 75% in both: general surgery and otorhinolaryngology) and 92% in ophthalmology ($p=0.05$). Moreover, gynaecologists residents were the less frequently registering blood exposure accidents (24%), compared to ophthalmologists (73%), general surgeons (25%) and otorhinolaryngologists (25%) ($p=0.01$).

Conclusion

The prevalence of ABE among resident surgeons is high, especially in gynaecology. Interventions to improve the in training surgeon's attitudes and practices related to blood exposure prevention are required.

P34 Compliance rate to good hygiene practices in unconscious patients' artificial feeding

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Introduction

Unconscious patients' survival in resuscitation has increased thanks to intensive care and to artificial feeding. Generally health institutions' pharmacies and physicians coordinate jointly this type of feeding.

Aims

Our objective was to assess conformity level of good hygiene practices (GPH) in the process of artificial feeding destined to unconscious patients, at a Tunisian university hospital.

Methods

During six months (from May to November 2017), we conducted an audit of artificial feeding process from the product's reception up to its administration to patients by filling in an evaluation grid accessing the GPH standards' level of application and the

respect of health rules by direct and repeated observations but also by interviewing the staff of both resuscitation department and pharmacy.

Results

A total of 216 observations and discussions with healthcare staff have been conducted. The overall hygiene standards' compliance rate applied to the whole process was 77.2%. The most non-compliant step was the storage at hospital central pharmacy (61.1%). On the other hand, despite shortcomings, the highest average compliance rate was patients' administration of the products (91.2%). Failures' causes have been analyzed by Ichikawa diagram of causes-effect and the SWOT (strength-weakness/opportunities-threats) analysis.

Conclusion

Our study has revealed defects along artificial feeding process, in our hospital, which can be remedied by GPH's application. In order to strengthen food security's systems, all establishment stakeholders must federate their effort and assume their responsibilities.

Healthcare associated infections' risks awareness: influence of physician's experience and age

P35

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Introduction

Good application degree of hygienic practice depends on doctors' perception and training (academic and continuous).

Aims

Our objectives were to specify healthcare associated infections (HAI) risks awareness degree according to physicians in private practice and to compare the two groups' answers relatively to their age (more or less than 50 years).

Methods

A descriptive cross-sectional study was realized in 2017 by means of a pre-tested and auto-administered

questionnaire with all the general practitioners of private practice in a coastal city of the Tunisian central east region.

Results

Participation's rate was 93.1% with a sex-ratio of 1.7. Sixty-two per cent of the general practitioners were less than 50-years old. A significant difference in favour of people under 50 was reported for the GHP's observance relatively to healthcare activities' waste management (87.3% versus 45.6%; $p=10^{-4}$). Respondents of less than 50 years formulate significantly more their wishes to do a training course in BPH (91.5% versus 54%; $p=10^{-4}$). The victims of blood exposure accidents (BEA) are significantly more prevailing among people over 50 years (62.2% versus 21,1%; $p=10^{-4}$).

Conclusion

The older general physicians, with long medical exercise need intensive reminders of updated recommendations, to improve healthcare associated infections (HAI) risks awareness, in daily management. It is justifiable to develop motivational and compensatory measures to favor work between peers. These initiatives require from professionals to seize HAI problem and to launch evaluation process.

P36 Medical device vigilance: physicians' knowledge, attitudes and practices

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Introduction

Evaluation of medical device vigilance (MDV) systems in different environments of medical practice represents an essential step to support improvement of healthcare's quality.

Objectives

The objective is to assess knowledge, attitudes and practices (KAP) of physicians relating to the MDV and to compare it between medical and surgical specialties, in the various hospital services of a Tunisian Central East University-Hospital.

Methods

A descriptive cross-sectional study was conducted in 2016 including 183 incumbent physicians performing in 24 hospital services, using a pre-established, pretested and self-administered questionnaire. Seizure and analysis of the data were made by SPSS software 20.0.

Results

Response rate was 81.9%, practicing physicians in medical services accounted for 81.1% of the participants. The doctors who recognize the existence of a standard form of reporting was significantly greater in the medical services than surgical ones (51.9% versus 27.8%; $p=0.04$). In addition, physicians who are convinced by the importance of reporting under the MDV was significantly more frequent in surgical services (66.7% versus 32.5%; $p=0.007$). The importance of efficient and organized MDV's management was more frequently reported by physicians of surgical services than medical ones (83.3% versus 14.3%; $p<0.001$).

Conclusion

The institutional strategies for the development of safety culture of care relating to the MDV must take account of the specialty of medical practice in order to better manage healthcare risks and to improve its quality and safety. Adaptation of doctors' KAP about MDV with training-information programs is crucial since they are influenced by the environment of medical practice.

P37 Prevention of healthcare associated infections in general medicine of liberal sector

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Introduction

Healthcare associated infections (HAI) occurring outside of health establishments are characterized by absence of controlled and organized prevention strategy with lack of structured epidemiological surveillance system which contributed to their under-estimate.

Aims

Our objective was to estimate degree of good hygiene practices (GHP)'s application among practitioners at their medical offices in a coastal town of Tunisia.

Methods

A descriptive cross-sectional study was conducted in 2016 using a self-administered and pre-tested questionnaire to all physicians in private practice of a coastal town in the Tunisian center.

Results

Response rate was 93.1%. Majority of respondents (75.92%) had an updated vaccination status. Hydroalcoholic solution was adopted by 53.7% for hands hygiene. "Autoclaving" for equipment sterilization is reported in 12.12% of cases. Gloves wearing in acts of invasive care were reported in 98.14%. The waste arising from involving infectious risks' care activities are classified with regular waste in 87,96% of cases. Doctors of less than 50 years are significantly more sorter of waste arising from their care activities, they have also a more updated vaccination status than those older than 50 years (respectively 36.61% versus 16.21%; $p=0.027$ and 83.09% versus 62.16%; $p=0.016$).

Conclusion

Knowledge of healthcare organization in liberal medical offices with identification of obstacles for achieving better observance of GHP allows precautions adaptation in this sector. To be able to fill in the gaps of training, information and awareness, and to organize HAI prevention in liberal sector, willingness to quality and safety care improvement is required with concrete involvement of several stakeholders.

P38 The blood exposure accident among trainees in medicine: from analysis to action

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University Hospital Farhat Hached, Sousse, Tunisia

Blood exposure accidents (BEA) are severe professional accidents where non experimented

interns represent a high risk group. BEA monitoring is one of the pillars of strategies for risks management in healthcare. The objective was to determine the situation of young medical trainees with BEA at the Tunisian university hospital in the prospect of improving their management practice.

We led a descriptive cross-sectional study of 2 months in 2017 including all intern trainees, at the University Hospital Farhat Hached. A pre-established, pre-tested and self administered questionnaire was used. Data seizure and analysis were made by the SPSS software v18.0.

Response rate was 80% (176/220). Updated vaccination status was reported in 70.5% of cases. One hundred and eleven trainees (63.07%) declared themselves to be victims of BEA. The main predisposing factors were: type of the medical act (92.6%), duration of that act (69.6%) and the emergency in doing it (67%).

Occurrence mechanisms were related to bites in 90.09%. The victims of BEA are significantly more, aware of its risks (96.39% vs 81.53%; $p=0.002$), when investigating the medical act's nature as predisposing factor and the depth of the wound as aggravating factor (respectively 98.19% vs 83.07%; $P<10^{-4}$ and 93.7% vs 67.69%; $P<10^{-4}$).

Improvement of BEA system management is required with need for training and awareness development, in order to improve risks perceptions but also the realization of practical lines for a multicenter-study that could be the precursor to the establishment of a national surveillance system of these accidents.

Measurement of safety culture nearby healthcare workers

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P39

Introduction

Delivering safe care has become an obligation that requires a strong patient safety culture (PSC).

Aim

The objective of this study is to measure the level of culture safety among healthcare workers.

Methods

This is a descriptive cross-sectional study conducted in a Tunisian hospital, during a three-month period from October to December 2015, using a self-administered and anonymous questionnaire inspired by the "Hospital Survey On Patient Safety Culture" (HSOPSC). This tool calculates the scores of the ten dimensions of the PSC.

Results

In total, 275 participants out of 446 included answered our questionnaire. The response rate was 61.65%. The average age of respondents was 41 ± 10.6 years with extremes of 25 to 60 years. The sex ratio (M/F) was 0.63. Professional seniority was above 11 years for 47% of respondents. Overall, the scores for the ten dimensions of the safety culture calculated were less than 50% except for the "Teamwork in the service" dimension which had the highest score of 58.1%. The dimensions of "non-punitive response to error" (29.6%), "Support and management for safety of care" (30.9%) and "Reporting adverse events" (33.2%) were low. The comparison of scores by occupational category, showed a significant difference for only one dimension "Non-punitive response to error" in favor of nurses. However, no significant difference was found for dimensions explored according to their work units.

Conclusion

Our results indicate that the safety culture is a priority in the healthcare system. Initiatives are needed to improve communication, error reporting and error response to create a positive climate for patient safety.

Prevalence and characteristics of *Candida* bloodstream infections in non-neutropenic patients of intensive care unit in West Pomeranian region

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Introduction/Aims

Candida - bloodstream infections (CBSI) has become significantly more frequent in recent years. Data of CBSI are still incomplete. The aim of the study was to report the prevalence of CBSI in ICU patients.

Methods

All 943 patients aged 22-83, at ICU (16 beds) of Teaching Hospital no 1 (900 beds), between 2012-2016 were submitted to the study. CBSI were recognized if blood cultures (BC) in BacT/Alert[®]FA/FN were positive for *Candida* >72 h after admission. Antifungal susceptibility was tested with E-test[®] and interpreted according to EUCAST criteria.

Results

Total number of 8321 BC was investigated, 430 were positive (45.6%), of which 59 (13.7%) were *Candida* positive. The prevalence of CBSI in 5-year study period was 12-16% and *Candida* spp. was the 3rd most common cause of all hospital - acquired sepsis between 2015-2016. Total mortality rate of CBSI was 42.3%, the highest for *C. glabrata*. The percentage of CBSI cases per number of hospitalizations was 4%. Over a half of patients with CBSI were males. *Candida* score >2.5 was observed in 50.8% of patients with CBSI. The most prevalent cause of CBSI was

Candida albicans - 45.0% followed by *C. glabrata* (31.7%) and *C. parapsilosis* (10.0%). Resistance of *C. albicans* and *C. non-albicans* towards fluconazole was 7.4% and 73.7% respectively. Resistance to echinocandins (11.7%) was noted in *C. parapsilosis* and in *C. albicans*.

Conclusions

C. glabrata prevalence is constantly increasing etiological agent of CBSI in ICU what may eliminate FLU from therapeutic options. Surveillance on CBSI is required in each ICUs.

P41 Electronic monitoring – using data to move culture from belief to reality

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Introduction

Reliable and valid data for hand hygiene (HH) adherence are elusive. In 2004, our acute care hospital began a journey to improve hand hygiene. 2004-2013, adherence by observational audit increased from 40% to 88%. Staff saw the problem as solved.

Objectives

We aimed to identify a more valid and reliable method of measuring HH adherence that was feasible and sustainable.

Methods

We identified group e-monitoring (GEM) as best available option. We validated denominators of HH opportunities (HHO) per pt-hr. A pilot was completed in 2014; in 2015, we implemented on 5 units, and in 2017 expanded to all units.

Results

Prior to the pilot, observational audit HH adherence was 90%; GEM adherence was 29%. Staff struggled with the difference, and the validity of GEM. Pilot adherence increased to 38%. We implemented on 5 units: in year 1, adherence increased from 27%

to 35%. Maintaining continuous improvement remains a challenge; but GEM data have allowed us to recognize that continuing improvements are necessary. Increased access to continuously available, more valid data has helped to place patient units in charge of their own improvement. In 2016, we substantially exceeded observational HH adherence targets on all units. In 2017, added units are part of a cooperative multi-center study, providing additional support for change, and permitting inclusion of GEM measures on the hospital quality improvement plan.

Conclusions

The relative absence of evidence makes selecting measurement methods for HH challenging. In our hospital, GEM is feasible and effective in supporting HH improvement.

Impact of promotional multi-component campaign on influenza vaccination coverage in healthcare workers in University Medical Centre Ljubljana

P42

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Annual vaccination against influenza in healthcare workers (HCW) is one of the keystones in prevention of spreading the disease in hospital settings. In Slovenia vaccination of HCW is highly recommended, but the coverage rates are among lowest in Europe (16.6% in 2012).

In University medical centre, the largest hospital in country with 8200 employees, influenza vaccination among HCW significantly decreased between 2005 and 2015 (37.8% to 10.4%). Major drop was seen after pandemic influenza season in 2010, when vaccination rates fell to 11.9%. Before 2010 there were only small differences between

HCW professions regarding vaccination coverage (doctors 35 to 49%, registered nurses 30 to 40%, nurses 22 to 30%). After 2010 only 5 to 10% nurses annually were vaccinated.

Since 2005 we worked intensively on removing administrative barriers to improve vaccination: it is free of charge for all employees, multiple locations and on-site vaccination delivery service at convenient times that are easily accessible is provided. Every year ICU who organized vaccination also provided educational campaigns and written educational materials – posters, pamphlets, but all that had no influence on increasing the vaccine uptake. Since 2016 ICU together with CIOTS works on comprehensive social marketing campaign with engaging opinion leaders, preparing special logo visual reminders, badges and symbolic gifts for vaccinated HCW.

This strategy increased vaccination coverage from 10.4 to 13.9% in 2016 and to 19.2% in 2017. Uptake in 2017/18 season increased in doctors to 48.7%, in registered nurses to 16.8% and nurses to 10.7%.

P43 Study of the lethality of infection/colonization by multidrug-resistant bacteria in hospitals of the Valencian Community (Spain)

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Introduction/Aims

The results of the 2015 antimicrobial resistance surveillance report (ECDC) are compatible with the failure of interventions against this phenomenon in several European countries. Of the 25000 annual deaths attributed to MDROs about 10% happen in Spain. The development of the National HAI Surveillance System (SIVIES) in the Valencian Community (2017) produces specific information

for each MDRO. The objective is to analyze the lethality of MDRO and potential risk factors in the Valencian Community.

Method

Global and specific lethalties in colonized/infected patients was calculated for the MDROs under surveillance in hospitals of the Valencian Community. In order to evaluate the usefulness of the SIVIES system, the impact of both intrinsic and extrinsic risk factors on lethality was calculated along with the lethality ratio between a 3rd level hospital and the Valencian Community as a whole.

Results

The lethality of MDROs in Valencian hospitals was 3%. Greatest lethalties were observed diabetics (3%) and cancer (2%) and kidney disease patients (3%). The extrinsic factors associated with higher lethality were urinary catheterization (3%), peripheral venous catheter (5%), previous antibiotic therapy (3%) and recent hospitalization (3%). The lethality ratio hospital/global was 1.1.

Conclusions

Extrinsic risk factors may play a role in the lethality of MDROs. A comparison between the lethality of MDRO and associated risk factors between a hospital and the global data provided by the SIVIES for prioritization of interventions.

Timing for hospital patient isolation after report of multi-drug-resistant organisms (MDRO's)

P44

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Introduction

Timing for activation of isolation precautions is likely to influence transmission of many MDRO's in the hospital setting; aim of our study was to analyze isolation times in a consecutive series of hospital patients.

Methods

Time lapses between isolation report and start of precautions were obtained by clinical charts.

Results

One hundred consecutive patients (male 56%) from 13 wards and with new diagnosis of colonization/infection by MDRO's were studied. Mean age was 74 yrs in man and 79.5 in women. Most frequently isolated MDRO's were Extended Spectrum Beta Lactamase Producing enterobacteriaceae (53% of patients), while urines were the most frequent biological sample (42%). Overall, mean time lapse since MDRO's report to isolation was 15.5 hours, with 50% of patients isolated within 6 hours after MDRO's report but 27% of patients after 24 hours. Mean isolation times were shorter in the critical area (8.3 hrs) than in the medical area (14.9 hrs) and in surgical area (20.1 hrs). Finally, mean isolation times were quite longer in the weekends: 24.1 hrs versus 11.5 hrs Monday to Friday.

Conclusions

We showed that reporting of MDRO's is not equivalent to prompt patient isolation. In our experience communication flows between lab and the wards showed to be disappointing, and needs to be improved. Therefore, we suggest that governance of all phases involved in hospital MDRO's control is mandatory, with an insight in the whole process weaknesses.

P45 Role of immunization of health care workers in prevention of nosocomial infections

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Introduction

According to the 'Law of Protection of People from Infectious Diseases' (Official gazette of the Federation of Bosnia and Herzegovina (BiH), number 29/05, article 2, paragraph 8) nosocomial infection is an infection that occurs during the providing of health services in a healthcare institution or by the provider in a private practice. These infections can affect patients, people employed in healthcare institutions (healthcare and non-healthcare workers) and visitors. There are different prevention measures that are used in practice and their implementation depends on behavior changes of each individual related to this problem.

Aim

To present the situation with the vaccination of healthcare workers in BiH.

Results

Some vaccines are mandatory, for example for the vaccine against Hep B. However, because of insufficient control of the vaccinal status and sometimes inadequate awareness of the healthcare workers the vaccinal coverage is not enough high and the percentage of non vaccinated healthcare workers against hep B is 20-40%. Some others vaccines are for healthcare workers only recommended (against influenza, measles, varicella) for specific working places, high risk departments (hematology, neonatology, oncology).

Conclusion

Immunization of healthcare workers as a measure to prevent occurrence and spread of nosocomial infection is not well applied in Bosnia and Herzegovina and it is necessary in the future to increase awareness of the need for vaccination of this group of people.

P46 Gas gangrene of *Clostridium perfringens* in two patients simultaneously hospitalised in a single department

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Introduction

Clostridium perfringens species is the most commonly isolated etiological factor for gas gangrene. Due to its high toxicity, which results in invasiveness, this species can be considered as alert pathogen.

Aims

We performed a comparative analysis of phenotypic and genetic similarity, determination of resistance profiles, detection of toxin-encoding genes and molecular typing of *C. perfringens* isolates originating from two patients with a clinical and microbiological diagnosis of gas gangrene who were hospitalized in one of the Polish hospitals in the period of time between 17th May 2017 and 4th July 2017.

Methods

The strains of *C. perfringens* were isolated on 31 May from 2 patients. The API 20A (BioMérieux) test, the Kirby-Bauer method and E-test, multiplex PCR and pulsed field gel electrophoresis (PFGE) were applied.

Results

The two *C. perfringens* isolates studied (8554/M/17 and 8567/M/17) had identical biochemical profiles and identical resistance patterns. All isolates showed the presence of *cpa* gene encoding α -toxin and *cpb2* gene encoding β 2-toxin. The isolates originating from the two studied patients represent two genetically different restrictive patterns which corresponded to two different clones but the isolate 8567/M/17 was identical with the clone 7143 isolated from the patient with gas gangrene hospitalized in the same hospital in 2015.

Conclusions

As a result of our epidemiological and molecular study, it is possible to conclude that the studied patients simultaneously hospitalized in a single

department of general surgery developed two different infections. Archiving of data from 2015 allowed identification of identical clone from the same hospital.

Epidemiological typing of ES β L-producing *Klebsiella pneumoniae* strains isolated in 2016 from the John Paul II Hospital in Krakow

P47

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Introduction

Extended-spectrum beta-lactamases (ES β Ls)-producing *Klebsiella pneumoniae* is a common cause of nosocomial infections worldwide. More attention should be devoted to monitoring the global distribution of such strains and identified their clonal characteristics. In study, Pulsed-Field Gel Electrophoresis (PFGE) analysis was performed to determine the clonal relationship between *K. pneumoniae* isolates.

Materials and Method

One hundred and forty two isolates of *K. pneumoniae* were studied. The strains were cultured from different clinical materials received from patients hospitalized at the John Paul II Hospital in Krakow between January 2016 and December 2016. Production of ES β L was assessed using double disk synergy test and confirmatory test. The genomic DNA was extracted from the strains separated by PFGE after digestion with *SpeI* endonuclease. Bionumerics software and GelCompare II 6.5 were used to create a dendrogram.

Results

The conducted research allowed to select PFGE clones among the tested strains. Five large PFGE pulsotypes designed from A to E (comprised 71% of the isolates, where A (n=35), B (n=21), C (n=17),

D (n=15), E (n=13)) were identified. The remaining isolates were clustered into minor clonal lineages and singletons.

Conclusions

Our data showed good typeability, reproducibility of SpeI for *K. pneumoniae* subtyping. Additionally, results revealed a large genetic diversity among *K. pneumoniae* isolates. Molecular typing methods are very useful in hospital for epidemiology studies of bacterial infections and spread of particularly dangerous clones.

P48 Impact of beta-lactamase-producing *Enterobacteriaceae* on the rise of MDRO related healthcare associated infections

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Introduction/Aims

The most frequent HAIs in the 2017 prevalence study EPINE in a 3rd level hospital were the *Enterobacteriaceae*; *E. coli* (16.2%) and *K. pneumoniae* (5.7%) and the Gram negative bacilli *P. aeruginosa* (12.4%), *S. maltophilia* (6.7%) and *A. baumannii* (5.7%). The hospital's surveillance system (SIVEIN) includes information on these mult-drug resistant organisms (MDRO) and MRSA since 2010 and can be complemented with the recently incorporated Spanish National Surveillance System (SIVIES).

The objective is to analyze the evolution of the incidence in a hospital setting of HAIs associated to ESKAPE, which represents a paradigm of resistance, pathogenesis and disease transmission.

Methods

Incidence rates were calculated (infection or colonisation by MMR /1000 hospital stays) per year, month and for the quinquennium 2013-2017. Trends were observed and intrinsic and extrinsic risk factors were analysed.

Results

Global IR went from 1.53 (2010) to 2.51 (2017) at the expense of *Enterobacteriaceae*, particularly *Klebsiella* spp. which went from 0.15 to 0.45. The trend for MRSA and Gram negative bacilli (except for *A. baumannii*) is descendant. *Enterobacteriaceae* related HAIs were associated to nephrology and urology wards, a higher mean age (71 vs 64 years) and parenteral nutrition/nasogastric tube. There appears to be a rise in community associated infection/colonisation.

Conclusions

BLP *Enterobacteriaceae* remain the culprit for the rise in mult-drug resistant Gram negative germs HAIs. MRSA associated HAIs follow a descendant trend.

Susceptibility and genetic relatedness of *Klebsiella pneumoniae* isolated from hospitalized patients

P49

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Introduction

Klebsiella pneumoniae is wide spread in nature and colonizes mucous membranes of mammals. *K. pneumoniae* is a representative of human gut microbiota, but also colonizes other niches of organism. Major virulence factors include polysaccharide capsule and cell surface receptors. *K. pneumoniae* is responsible for wide range of endogenous infections in immunocompromised hosts, mostly within hospital settings. *K. pneumoniae* exhibits multiple resistance mechanisms, among them ESBL are the most common, whereas carbapenemases production is the most dangerous. The incidence of multiresistant *K. pneumoniae* hospital associated infections has increased in recent years and clinical picture of infections is infrequently severe with high level of mortality.

The aim of the study was to determine the antimicrobial susceptibility of 21 *K. pneumoniae* isolated from hospital-acquired infections in patients hospitalized in Clinical Hospital No 1 in Szczecin (Poland) and to determine the genetic relatedness of tested strains.

Methods

The study was conducted on *K. pneumoniae* ESBL-positive. Susceptibility to antimicrobial agents was determined and interpreted according to EUCAST recommendations. Genetic relatedness was determined with using PFGE (Bio-Rad Laboratories).

Results

All of examined strains showed resistance to most of broad-spectrum antimicrobial agents among them cephalosporins, fluoroquinolones, or cotrimoxazole. Susceptibility to aminoglycosides and carbapenems were found more diversified, although all tested strains demonstrated decreased susceptibility or resistance to ertapenem. PFGE analysis results revealed the existence of epidemic strains.

Conclusions

Transmission of multiresistant *K. pneumoniae* is strictly associated with human migration thus tracking of this process is fundamental principle of infection control.

P50 Colistin resistance among *Klebsiella pneumoniae* strains in Pomeranian region hospitals

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Introduction

Colistin is one of the last-resort antibiotics used to treat carbapenem-resistant *Klebsiella pneumoniae* infections however the resistance to colistin among this pathogen is increasingly observed.

The aim of this study was to characterize colistin resistance among *K. pneumoniae*.

Materials and Methods

284 *K. pneumoniae* strains isolated from patients hospitalized in 3 hospitals in Pomeranian region in time period 2012-2016 were analyzed. Strains were isolated from different wards and clinical specimens. MIC values were determined according to EUCAST recommendations. PFGE method was used to determine the clonal relatedness between colistin-resistant strains.

Results

All examined strains were ESBL+, 6 simultaneously AmpC+. 19 (6.7%) *K. pneumoniae* (MIC: 4-16 µg/ml) were colistin resistant. Among them 63.2% were non-susceptible to at least one carbapenem and were isolated from patients of intensive care units (ICU) or surgery wards, from BAL (16), blood (1), wound (1) and central venous catheter (1). 5 genetic types: A-4 strains, B-4, C-3, D-2, E-4 and 2 unique patterns were distinguished. Strains sharing the same genetic pattern were isolated from patients hospitalized in the same ward. The transmission of strains between patients of different wards was not observed.

Conclusion

Colistin-resistant *K. pneumoniae* strains become a very important problem in ICU where colistin is frequently used. Genetic relatedness between colistin-resistant isolates is an evidence of horizontal transmission between patients hospitalized in the same ward. Therefore, well-designed surveillance effort is a necessity for an effective infection control program and in promoting improved patient care.

Implementing an antibiotic stewardship information system to improve prevention and control of antibiotic resistant infections: a co-design process

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P51

Introduction

The global health capacity to sustainably tackle infectious diseases is at risk, by the rising of antibiotic resistance (AR). Healthcare-associated infections (HAI) caused by antibiotic-resistant pathogens are an important cause of morbidity, frequently leading to mortality, worldwide. It impacts populations, seriously weakening their health, socially and economically, being a global public health priority.

To prevent and control it, several strategies have been described, such as surveillance and decision-support information systems or antibiotic stewardship programs (ASP) development, allowing the professional to be at the forefront of action.

Aiming at decreasing antibiotic-resistant HAI in three Portuguese hospitals, HAITool was co-designed to support an effective ASP, leveraging the healthcare professionals' work.

Methods

HAITool, a surveillance and decision-support information system, was developed and implemented, on the Design Science Research Methodology (DSRM) framework. Hence, full participation was ensured, counting on the close collaboration of researchers and a multidisciplinary team, in each of the participant's hospital.

Results

HAITool enables effective monitoring of antibiotic resistance, antibiotic use and provides an antibiotic prescription decision-supporting system by clinicians, strengthening the patient safety procedures. HAITool includes integrated views of patients, microbiology and pharmacy data, displayed in innovative layouts and graphics, with alerts and reminders included.

Conclusions

The design, development and implementation process, reveals benefits in organizational and behavior change with significant success. Leadership commitment, multidisciplinary team and mainly informaticians engagement was crucial to the implementation process.

HAITool turns to be unquestionably an important step forward to reduce antibiotic misuse and to control and prevent antibiotic-resistant HAI

The use of disinfection solutions must be verified

P52

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Introduction

Taking samples after hand hygiene with disinfectant liquid soap is a normal method in hospitals. Prevention control team identifies germs with high resistance in hospital, especially in surgical wards, and may take measures to prevent infections (HAI).

Interventions

We take samples monthly in surgical wards. After cleaning hands with disinfectant soap we take samples from doctors and nurses.

Results

One day we had an alarm from the laboratory because they found *Pseudomonas aeruginosa* in 2 samples in a general surgery ward. We were there when the samples was taken and everything was ok. We went again and took another samples from the same ward, but from different staff. Results was identical. We took samples from the lavatory, the surfaces, and the pump of liquid soap vial. The sample from soap vial was with *Pseudomonas aeruginosa*. After talking with the staff they admit they don't use frequently the soap because they prefer alcohol hand hygiene. So the pump of the soap vial can become plugged if it is not used. After one year we have noticed that an entire lot of this soap was diluted before delivering to hospitals.

Conclusions

1. Checking random the solutions for disinfection delivered in hospitals (by indirect methods) can identify problems.
2. Not using long time a liquid soap plug the bottom of the pump which can become a place for multiplying germs. This vial can induce HAI.

P53 **Characterization of *Staphylococcus aureus* strains isolated from cases of ear infections**

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Man's psycho-physical contacts are made with the help of the senses, among which one of the most important is the sense of hearing. Ear infections can interfere with efficient operation and even lead to permanent and irreversible deterioration or damage to the function. Touching people of different ages, they aggravate developmental and cognitive abilities and significantly reduce the quality of life.

Staphylococcus aureus is one of the most important etiologic factor of ear infections.

The aim of the study was to analyze the drug resistance and virulence of SA isolated from Polish patients.

Drug resistance was examined in accordance with the EUCAST. Presence of antibiotic and virulence genes were detected by PCR, the genetic affinities of the tested strains were examined by pulsed field electrophoresis PFGE.

There were 41 SA strains, including 34 from outpatients, 7 from hospital patients (3 from neonatal ward). Median age of patients was 41.

SA strains were classified into the groups: susceptible (85.4%), and multi-drug resistant (6%). Most strains were resistant to tetracycline (24.4%), erythromycin, clindamycin (12.2%), aminoglycosides (9.8%). Among the detected virulence genes, the Luke gene were most frequent (61%), the tsst (9.8%) and etA (4.9%) were the least frequent. There was no correlation between the number of virulence genes and the type of resistance.

The tested strains were not related to each other - they showed great genetic diversity.

MDR strains were isolated from the oldest patients.

Bloodstream infections in Polish intensive care units

P54

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Introduction

Bloodstream infections (BSI) in intensive care units (ICUs) are some of the most frequent healthcare associated infection (HAI) types. They are a serious complication of hospitalization. The aim of the study was epidemiological analysis of BSI in Polish ICUs, their etiological factors and antibiotic treatment.

Material and Methods

Retrospective analysis included results of surveillance in seven ICUs (for adult patients) located in Southeastern Poland. 2547 patients hospitalized over 48 hours were included in the study. HAI-Net protocol recommended by European Centre for Disease Prevention and Control (ECDC) was used for case detection.

Results

184 cases of BSI were detected, among them: 65 (35.3%) BSI in patients with central venous catheter (catheter-related BSI, CRI); 87 (47.3%) cases were secondary to different types of infections (secondary BSI, S-BSI), the other 32 cases (17.4%) were qualified as BSI with unknown source of origin. BSI incidence rate was 7.2‰ and incidence density was 9.2 per 1000 patient days. Mortality rate was 20%. For CRI-BSI dominating etiological factors were: Coagulase-negative staphylococci 20.8%, and for S-BSI *Acinetobacter baumannii* 43.5%. *Klebsiella pneumoniae* in 96.0% revealed resistance to 3rd generation cephalosporins; *Acinetobacter baumannii* in 78.8% was resistant to imipenem. Other beta-lactam J01D (31.0%) and J01X (26.6%) were the groups more often used in BSI treatment.

Conclusions

BSI incidence in study units was higher than observed in other European countries and also secondary BSI were more common. Microbiological etiology of

BSI and its antibiotic resistance indicate necessity of undertaking target activities for improving the situation in Polish ICUs.

P55 **Bare below the elbows: is this policy performed by healthcare workers in Poland?**

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Introduction

Although medical opinion about validity of bare below the elbows (BBE) policy is divided, guidelines are initiated in different countries.

Objectives

The aim of this study was to determine whether the principals of BBE were compliance by medical staff in Polish hospitals and how noncompliance effects on hand disinfection procedure by using UV lamp and substance.

Methods

Within hand hygiene training organized in 134 hospitals were checked among volunteers respected dress code without watch, rings, bracelets, no polished short nails and short sleeves. In addition to occupation, job seniority, gender and place of work were determined.

Results

In a voluntary assessment were 7544 persons (doctors– 1470, nurses– 3803, non-medical staff– 271). 3932 (52.1%) of staff fulfills BBE criterias. 3612 (47.9%) were classified as non BBE. Nurses and non-medical staff were statistically significant BBE (respectively 53.2% vs 46.8%; $p=0.001$ and 53.7% vs 46.3%; $p=0.006$). Majority of doctors were nonBBE (783; 53.3%) in comparison to BBE (687; 46.7%) ($p=0.041$). Statistical analysis showed that compliance of BBE policy to all tested persons was significantly increased when: working in operating theatres (OR=1.56, CI; 1.41-1.73); job seniority below

10 years (OR=1.24, CI;1.13;1.37) but decreased when: the occupation–physician (OR=0.76, CI;0.68;0.86), working in the ICU (OR=0.8, CI;0.66;0.97), working in general departments (OR=0.7, CI;0.64-0.78).

In a nonBBE workers was found painted nails– 41.8%, rings– 34.4%, watch– 30.5%, long sleeves– 28.1%, long nails– 13.4%, bracelets– 9.8%.

BBE personnel performed proper hand disinfection (2875/3932; 73.1%) statistically more often than nonBBE group (2004/3612; 55.5%) ($p<0.0001$) in all occupations.

Conclusion

It was found that BBE policy effects on proper hand disinfection procedure. BBE rules should be recommended especially for doctors.

Performance of risk adjustment between the former NNIS risk index and the new NHSN risk model for postoperative colorectal surgical site infection

P56

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Introduction

One of serious operative complications of colorectal surgery is surgical site infection (SSI). The new risk adjustment model was proposed by the Centers for Disease Control and Prevention (CDC) to replace the former one.

Aims

To compare the performance of risk adjustment between the former NNIS risk index and the new NHSN procedure-specific risk model for postoperative colorectal surgery surgical site infection.

Methods

A retrospective cohort study was conducted. Surveillance of data for post colorectal surgical site infection was retrieved from Songklanagarind Hospital which surveillance system use to the

former NNIS risk index for SSI adjustment. Data included 1,989 patients underwent 1,989 colorectal surgery procedures in the hospital between January 2005 and December 2016. Medical records were retrieved for additional information regarding emergency colorectal surgery to fulfill requirement for calculating risk of SSI by the new model. The predictive performance between the two models was then compared by mean of area under the receiver operating characteristic (ROC) curve.

Results

In this retrospective cohort study from January 2005 to December 2016, 1,989 procedures of the 1,989 patients were included by using inclusion criteria and 15 patients were excluded. In our study are remaining 1,974 procedures. Surgical site infections after colorectal surgery procedures occurred in 85 of total procedures, accounting for 4.3%. In colectomy area under the curve (AUC) yielded 0.6196 and 0.5976 for the former NNIS risk index model and the new NHSN procedure-specific risk model. The difference in area under curve did not show statistically significant with p-value 0.39. In rectal surgery area under the curve (AUC) yielded 0.516 and 0.49 for the former NNIS risk index model and the new NHSN procedure-specific risk model. The difference in area under curve did not show statistically significant with p-value 0.56.

Conclusion

The new NHSN procedure-specific risk model was not better than the former NNIS risk index for risk stratification to predict postoperative colorectal surgery surgical site infections in our patients. For suggestion, we would like to apply the former NNIS risk index for Songklanagarind Hospital because of using less data, less effort but has great reliability.

P57 **An effective intervention to eradicate *Serratia marcescens* during an outbreak of catheter-associated bacteremia**

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Introduction

Reports of infections caused by *Serratia marcescens* in the neonatal intensive care unit (NICU) at Hospital Interzonal de Ezeiza date back to 2011. In 2013, an infection prevention and control program began, which comprises different interventions, such as training staff and a hand washing campaign. Such strategy led to a reduction in the number of cases, the last one was in November, 2015.

Objective

To identify possible sources of *S. marcescens* in the NICU and to establish how transmission occurs in order to eradicate the germ and achieve CAB rates = 0.

Methods

A prospective intervention study was carried out at the NICU of a public, medium complexity, acute care hospital comprising 20 units (the facility is open and divided in sectors). The NICU has lactation room for exclusive use. Surveillance is carried out as defined by the national VIHDA program, and newborns are stratified based on their birth weight.

On March 17, 2016, the first catheter-associated bacteremia (CAB) was diagnosed, and a total of 13 cases occurred by November 15, 2016. *S. marcescens* was the only agent isolated, consistent with an outbreak situation. All cases occurred between 48 and 72 h after central vascular catheter (CVC) insertion, and they were low-birth-weight (<2000 g) newborns, except for one case (3600 g). Seven neonates were receiving parenteral nutrition (PTN).

Bacteriological screening was performed, and surveillance and educational activities were carried out at different times. After that, the infection control committee decided that the following measures be adopted:

1. CVC insertion checklist;

2. delimited area for medication and PTN preparation;
3. reinforcement of hand washing procedures;
4. replacement of cleaning products (detergent and sodium hypochlorite) with hydrogen peroxide, sodium dichloroisocyanurate, and disposable wipes;
5. training of cleaning staff stably assigned to the NICU.

As a result of the surveillance phase, a common misconception among nursing staff in some work shifts showed up: they considered the lactation room to be the most aseptic place for PTN preparation. Besides, sets of tubing for breast milk pumps were not enough to ensure proper disinfection between uses. Therefore, an additional intervention was to remove pumps and begin manual extraction.

Results

During the screening, *S. marcescens* was only found in a breast milk sample, and the implemented measures were thus reinforced. From the beginning of the intervention to June 30, 2017, only one case of CAB occurred. The affected newborn weighed 720 g. In neonates weighing < 1000 g, the rate was 14.29% 0.70 days/catheter. No healthcare associated infections (HAI) affected the rest of the weight ranges. Clonal results are pending.

Conclusions

Both the infection control committee and NICU staff committed to the purpose of eradicating infections. Although CAB rates = 0 could not be achieved, only one case of CAB occurred in a low-birth-weight newborn. In addition, *S. marcescens* was not isolated and in general HAI were reduced. We consider that the intervention has been successful, and these results challenge us to maintain the present rates.

P58 Traffic flow and microbial air contamination in operating rooms at a major teaching hospital in Ghana

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Background

Current literature examining the relationship between door-opening rate, number of people present and microbial air contamination in the operating room is limited. Studies are especially needed from low- and middle-income countries, where the risk of surgical site infections is high.

Aim

To assess microbial air contamination in operating rooms at a Ghanaian teaching hospital and the association with door openings and number of people present. Moreover, we aim to document reasons for door-opening.

Methods

We conducted active air sampling using an MAS-100® portable impactor during 124 clean or clean-contaminated elective surgical procedures. The number of people present, door-opening rate and the reasons for each door-opening were recorded by direct observation using pretested structured observation forms.

Results

During surgery, the mean number of Colony Forming Units (CFU) was 328 CFU/m³ air, and 429 (84%) of 510 samples exceeded a recommended level of 180 CFU/m³. Of 6717 door-openings recorded, 77% were considered unnecessary. We found that CFU/m³ were strongly correlated to the number of people present (p=0.001) and the number of door-openings/hour (p=0.02). In empty operating rooms, mean CFU count was 39 CFU/m³ after one hour of uninterrupted ventilation and 52 (51%) of 102 samples exceeded a recommended level of 35 CFU/m³.

Conclusion

The study revealed high values of intraoperative airborne CFU exceeding recommended levels. Minimizing the number of door-openings and people present during surgery could be an effective strategy to reduce air contamination in low- and middle-income settings. Results will be published open-access. Please visit: <https://doi.org/10.1016/j.jhin.2017.12.010> for further study details.

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Background

In low- and middle-income countries, the risk of surgical site infection is high, with huge financial and human cost. Airborne bacteria in the operating room represents a possible infection risk, but is currently not a focus area in low- and middle-income countries. The aim of the study was to examine the genetic correlation between intraoperative airborne bacteria and bacteria causing surgical site infections.

Methods

A total of 128 patients undergoing clean or clean-contaminated elective procedures were followed for 30 days using active surveillance consisting of phone calls and clinical examinations 3, 14 and 30 days after surgery. Intraoperative air samples were obtained using a MAS-100® portable impactor, and E-swabs™ were used to collect sample material from infected wounds. Comparison of bacteria isolated from wound- and air samples was done by, MALDI-TOF identification, Riboprint, and whole-genome-sequencing.

Results

116 of 128 patients (91%) completed the follow-up and surgical site infections were discovered in 11 cases (9%). Known pathogenic bacteria were isolated from air samples in all cases with subsequent wound infections. Match between air and wound samples were found at species level in 8 cases (73%), and further confirmed by Riboprint in 6 cases (55%) and by whole-genome-sequencing in 1 case (9%).

Conclusion

The study revealed high levels of intraoperative airborne bacteria, a high surgical site infection rate and established a genetic link between intraoperative

P59 Genetic relationship of intraoperative airborne bacteria and bacteria causing surgical site infections at a major Ghanaian Teaching Hospital

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airborne bacteria and bacteria causing surgical site infections. Surgical air-quality should be included in future interventions to prevent surgical site infections in low- and middle-income countries.

P60 **Investigation of nosocomial outbreak due to *Acinetobacter baumannii* MDR in surgical unit**

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Introduction/Aims

The genus *Acinetobacter* has, recently, demonstrated a rapid increase in resistance to antibiotics and may spread in the hospital environment causing epidemic outbreaks. The aim of this study is to describe the outbreak, characterize the strains and present the actions undertaken to eliminate it.

Interventions

The epidemic outbreak in the surgical unit lasted one month. There were 6 cases of *Acinetobacter baumannii* MDR derived from different wounds. The strains isolated resulted in surgical site infection in 3 patients; in others, there was wound colonization or superinfection. The strains were identified using MALDI-TOF. Drug susceptibility was interpreted according to EUCAST. PFGE and MLST determined molecular similarity. In the epidemiological investigation, 34 hospital inanimate environment examinations and 11 tests among the staff (hand smears) were performed. To eliminate the outbreak, many activities were undertaken, among others: isolation of infected and colonized patients, supervision of infection control team (ICT) over compliance with the sanitary and epidemiological regime in the unit, inspection of applicable isolation procedures, instructing staff in the sanitary and hygienic regime in the ward, trainings for the department staff and the cleaning company on hand decontamination and isolation rules, halting admissions, decontamination (fumigation) of operating rooms and the ward.

Conclusions

Most probably, the source of the infection was the first patient and the hands of the staff served as a transmission route for pathogens. The outbreak triggered verification and improvement of hospital procedures and increased the staff's knowledge and awareness concerning procedures limiting the risk of infection with this microorganism.

Drawing contest at the Albert Szent-Györgyi Health Centre of University of Szeged to promote hand hygiene

P61

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Introduction

Several studies have drawn the attention to the fact that not only the hands of healthcare workers (HCWs), but also the hands of patients can play a potential role in the spread of infections. Patient education on hand hygiene (HH) is also important and it should be started at a young age.

Methods

In April–May, 2017, new 'talking walls' posters were made by children (age between 5–15 yo) whom relatives work at the Health Centre. To motivate the participation, a drawing contest was organized. Applicants were asked to illustrate a 'successful battle against super bugs' or 'performing HH during healthcare'. Also it was emphasized that the posters should be colourful and A/4 in size.

Results

20 drawings met the criteria. The best three applicants were well-prized, but all children were given valuable gift for participating. All of the drawings were multiplied and hang on the corridors of the units.

Conclusion

These new HH posters raised the awareness of performing HH and the spread of multi drug resistant organisms from the patient's point of

view. Patient safety could be accomplished, if all the visitors, patients and staff in healthcare perform proper HH, moreover, in order to increase the HH compliance of HCWs, patients should be encouraged to draw the HCWs' attention to disinfect their hands before performing patient care.

P62 VRE infections in ICU patients – an experience report from two specialist hospitals in Kraków, Poland

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Introduction/Aims

The aim of this study was to define the epidemiological associations of vancomycin-resistant enterococci (VRE) in intensive care units (ICUs) by examining prevalence and risk factors for colonization and infections.

Methods

The study period was one year, and involved ICUs in two hospitals classified as specialist hospitals, multiprofile centers, treating mainly adults. Details obtained from patients included demographic and clinical data. Whereas data from hospitals included body sites from which VRE were recovered and co-existing infections. Strain drug susceptibility and resistance genes were also evaluated.

Results

Among the 24 patients in the hospital A and the 59 patients in hospital B who acquired VRE isolates

during their ICU stays, 6 in A and 17 in B had VRE *Enterococcus faecium* infections and the others were VRE-colonizers. Among patients with VRE_{fm} infections and colonization there were more men than women. The oldest patient group was colonized patients in hospital B. Among underlying diseases, with which the patients were admitted into ICUs, in hospital A, these were most often cardiac disorders (44.4%), while in hospital B, abdominal disorders and infections (72.2%) were predominant. The strains isolated were MDR. In ICU A, VanB strains were more common, while VanA dominated the other hospital.

Conclusions

Earlier surgeries were the most important risk factor for acquiring VRE in ICU patients in the hospitals studied. Other significant risk factors were age and earlier hospitalization in other hospital units. The strains tested belonged to MDR pathogens. They differed in the phenotype of resistance to glycopeptides.

Evaluation of the activity of different disinfectants in relation to various bacterial biofilms

P63

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Introduction

Disinfectants should meet the requirements of the appropriate PN-EN standards concerning antimicrobial activity. The susceptibility of microorganisms presented in the biofilm structures to the antimicrobials is worse as compared to the susceptibility of planktonic bacteria to these agents.

The aim of the study was to assess the bactericidal effectiveness of selected disinfectants available on the Polish market, against the biofilm created by both standard bacterial strains and clinical isolates using the minimum biofilm eradication concentration (MBECTM) assay.

Methods

8 products containing different active substances, such as: alcohols, aldehydes, biguanides, quaternary ammonium compounds, phenols, amine derivatives, and oxidizing compounds were assayed. Gram-positive and Gram-negative standard bacterial strains (n=10) from the ATCC and clinical, multiresistant isolates (n=17) were tested. The American standard ASTM E2799-11 "Standard test method for testing disinfectant efficacy against *P. aeruginosa* biofilm using the minimum biofilm eradication concentration MBEC assay", with some modification, was applied.

Results

Preparation Klercide 70/30 containing isopropanol showed the strongest bactericidal activity against all biofilms tested, regardless of bacteria species and biofilm age, in the shortest time 1 min. Aldewir (glutaraldehyde with quaternary ammonium), Incidin Oxy Des (hydrogen peroxide with benzalkonium), Sekusept Plus (glucoprotamine), Gluxodent (chlorhexidine), Medicarine (chlorine) and Rafasept (phenolic compounds) required longer contact time for eradication of biofilm of certain bacteria strains. Steril-Ser (sodium percarbonate with TAED) required 60 min against old *S. marcescens* biofilms to obtain a high reduction rate.

Conclusions

Assessment of the bactericidal effectiveness of disinfecting products, in relation to the bacterial biofilm allows to choose more active preparations.

P64 Global survey on the handling of human waste and bedpan management

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Disposal of faeces and urine and improper decontamination of bedpans and urine bottles pose risks for contamination and transmission

of multi drug resistant organisms (MDRO). Many healthcare settings do not have clear steps to outline bedpan management (BPM). Dirty utility rooms are poorly equipped and potential reservoirs of MDRO. The impact that bedpan and urine bottles may have on the transmission of HAIs is often overlooked.

Objectives

To determine and assess the awareness for safe BPM and the related risks for healthcare associated infections (HAIs).

Methods

Observations BPM, experience exchanges with infection prevention professionals and a digital survey.

Results

- 44 visits to low- and high income countries,
- 69 standardized interviews,
- 234 responders survey from 44 countries,
- 4% - 29%, reported infections (urinary tract, gastrointestinal, wound, other) through poor BPM with, *Clostridium difficile*, CRE, MRSA, Rotavirus, *Salmonella* species and VRE,
- 35% never searched for the role of BPM as a source in outbreaks,
- 27% had guidelines for bedpan management in case of MDRO,
- 88% bedpan emptied in toilets or slophoppers with splatters,
- 24% have guidelines for bedpan management in case of MDRO,
- 38% of patients in ICU are diapered without medical indication,
- 47% no equipment for emptying and decontamination for bedpan/urine bottle,
- 10% use a Macerator, 45% use a Washer/Disinfector (WD), 14% use a Liner (Coverbag),
- 32% no separation of clean and dirty items in the sluice room.

Recommendations

BPM needs to be addressed as a risk reduction initiative for HAIs.

P65 Can the patient be a partner in the prophylaxis of healthcare associated infections in Poland?

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Objective

The objective of the study is getting to know what the knowledge and attitudes towards hand hygiene (HH) are among patients and healthcare workers (HCWs) as regards the prophylaxis of healthcare-associated infections (HAI).

Material and Methods

The survey was carried out in 2015, 459 respondents took part in the poll, including 173 (37.4%) patients and 289 (62.6%) HCWs. Additionally, 57 HCWs were interviewed.

Results

Healthcare workers did not always use '5 moments for HH' in the required situations. Only 75% patients and 54% of HCWs noticed the application of HH before blood sample collection. Patients and HCWs 329 (72%) claimed that the primary and secondary schools which educated them did not provide soaps or towels, but the situation improved with the passage of time ($p < 0.001$). Healthcare workers rated HH of other HCWs poorly (average of 3.2). 30 (53%) HCWs undergoing interviews did not encounter a request for HH from a patient, 20 (35%) felt ashamed and embarrassed after such a request, 5 (9%) conducted HH and 2 (4%) took an aggressive or defensive stance. In interviews, 23 (40%) HCWs did not admonish others when they did not use HH, 8 (14%) did not do it and 26 (46%) abstained from answering.

Conclusion

HCWs' lack of compliance with '5 moments for HH' significantly reduces patients' safety. Lack of proper supplies in school bathrooms impedes the development of positive HH habits among children and teenagers. There are barriers as regards treating patients as partners in HH.

P66 Disinfection efficacy is impacted by strain, disinfectant type, concentration, and contact time

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Transmission of healthcare-associated infections caused by antibiotic- and multi-drug resistant (MDR) pathogens (e.g. Meticillin-resistant *Staphylococcus aureus* (MRSA), *Pseudomonas aeruginosa*) are a major concern in patient care facilities. Disinfectant usage is critical to control and prevent pathogen transmission, yet the relationships among strain, disinfectant type, contact time, and concentration are not well-characterized. The purpose of this study was to examine disinfectant concentration and contact time on bactericidal efficacy of *S. aureus* and *P. aeruginosa*, including clinically relevant strains with MDR or meticillin resistance.

Accelerated hydrogen peroxide, quaternary ammonium compound, and sodium hypochlorite disinfectants were tested at label and reduced contact times and concentrations against four MDR *P. aeruginosa* strains and four meticillin-resistant *S. aureus* strains. EPA method MB-25-02 was used to measure disinfectant efficacy reported as log₁₀ reduction.

Both off-label disinfectant concentrations and contact times significantly affected efficacy of all disinfectants tested. We found no consistent relationships between antibiotic resistance and disinfectant tolerance under both label and off-label conditions. Bactericidal efficacy varied among MRSA and *P. aeruginosa* strains. It is not clear what the clinical significance is of the differences in disinfection tolerance. The quantitative disinfectant efficacy method used here highlights the inter-strain variability that exists within a bacterial species. It also underscores the need for a disinfectant validation method that takes these variances into account.

P67 **Airborne *Aspergillus fumigatus* spore concentration during demolition of a building on a hospital area**

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Introduction/Aims

Invasive Aspergillosis has been associated with demolition in or adjacent to hospitals. Between April and August 2016, a building of the University Hospital Essen was demolished while immunocompromised patients were being treated in the immediate vicinity. To determine the risk for patients during demolition we measured the airborne *Aspergillus fumigatus* spore concentration and recorded the number of aspergillosis cases.

Methods

Air sampling before, during and after demolition was performed at three positions around the building (200 samples in total), factoring in meteorological data. The correlation between concentration of *A. fumigatus* and aspergillosis cases in 2015 and 2016 was analyzed using data from microbiological diagnostics (*A. fumigatus* isolates in respiratory secretes, *Aspergillus* galactomannan from serum/BAL), as well as aspergillosis cases documented by clinicians.

Results

Average concentrations of *A. fumigatus* did not differ significantly between the three periods before (17.5 cfu/m³), during (20.8 cfu/m³) and after (17.7 cfu/m³) demolition (p=0.26). Several peaks were recorded but none correlated with demolition activity. There was no significant correlation of any weather parameter with the *A. fumigatus* concentration. About 10% of the isolates were resistant against medical triazoles. Genotyping revealed a high heterogeneity and no clustering with azole resistant isolates from patients in 2016. Clinical data revealed that aspergillosis cases in 2015 and 2016 did not differ significantly.

Conclusions

The results showed no correlation between *A. fumigatus* spore concentration, demolition, and the incidence of aspergillosis. Additionally, azole resistant isolates from the hospital environment did not cluster with resistant strains from patients.

Superinfection with different human cytomegalovirus (HCMV) strains following allogeneic hematopoietic stem cell transplantation (allo-HSCT)

P68

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Infection with HCMV, despite diagnostic techniques and post-transplant antiviral prophylaxis, remains a leading cause of serious infectious complications, increasing morbidity and mortality of allo-HSCT recipients. In contrast to organ transplant recipients, seropositive allo-HSCT patients exposed to recurrent infections are a high-risk group of that complications.

In our research, reactivation from reinfection with a different strain of HCMV was distinguished by genotyping isolates obtained from the same patient at different times after transplantation.

The sequences encoding gB glycoprotein of HCMV as the target gene and real-time PCR was used, which in the case of coinfection gave the opportunity to determine the mutual quantitative proportions between genotypes.

The study was carried out in 30 allo-HSCT recipients with HCMV infection from which 105 isolates were genotyped. Superinfections were confirmed in 12 (40%) recipients. Genotype gB1 dominated, although in cases of mixed infections characteristic was always the presence of gB3 or gB4. The viral copy number

was significantly higher in samples with mixed genotypes than in samples with a single genotype. In patients with mixed genotypes, chronic infections and GvHD were observed more often, and also antiviral treatment results presented worse. This adverse effect observed in cases with mixed infections could be related to the presence of gB3 and gB4 genotypes, which gives greater immuno- and myelosuppression in comparison to genotypes gB1 and gB2.

Our results confirmed frequent HCMV superinfections after allo-HSCT and showed that the presence of specific antibodies does not protect recipients from their occurrence and development of the CMV disease.

P69 FISH and PCR versus blood culture as screening tests for sepsis in children and the influence of antibiotherapy on the detectability of bacteria

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Background

Timely diagnosis is critical in the management of sepsis. The gold standard in microbiological diagnostics of sepsis is a blood culture in automated systems. This method is time consuming, may take several days, and has low sensitivity. New screening methods that could quickly reveal the presence of bacteria in the direct smear would be extremely useful. The objective of this study was to estimate the effectiveness of these methods in comparison to traditional blood cultures in the context of antibiotherapy.

Methods

Blood samples from 111 children with suspected sepsis were analyzed. Blood cultures were carried out in standard automated systems. Simultaneously, samples were processed using FISH and PCR methods. The preparations were analyzed using the fluorescence microscope and the thermocycler.

Results

Traditional blood cultures, FISH and PCR yielded positive results in 18%, 39.1%, and 71.7% of samples, respectively. Significant differences were found between the results obtained through blood culture before and after induction of antibiotherapy: 25.8% vs 8.2%. There was no significant difference in FISH and PCR results in relation to growth inhibitors. Time to test results for FISH and PCR averaged 4-5 hours.

Conclusions

The new techniques of FISH and PCR allow to detect bacteria in blood without prior culture.

These methods have high sensitivity for the detection of bacteremia regardless of antibiotherapy. They provide more timely results as compared to automated blood culture testing, and they may be useful as rapid screening tests in sepsis.

Food poisoning and infections in Bochnia and Malopolska voivodeship in 2014-2016

P70

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Food poisoning and infections caused by bacteria and viruses are still a threat to health.

The paper presents the incidence of salmonellosis, Rotaviruses and Noroviruses in Bochnia, Malopolska and Poland.

Data (for the years 2014-2016) have been related to information about collective outbreaks of poisoning and food infections with *Salmonella enteritidis*, Rotaviruses, Noroviruses and morbidity. Data came from annual reports of the Department of Epidemiology of the National Institute of Public Health and the SPSI in Bochnia.

The incidence of salmonellosis in Poland ranged from 26.1/100,000 inhabitants (2016) to 21.8/100,000 inhabitants (2014). Decrease in the incidences of Rotaviruses in 2016 in comparison with 2015 and 2014 were observed (59.7% and 58.8% respectively). In 2016, the Noroviruses poisoning increased by 1% in comparison to 2015 and by 57.3%, respectively to 2014. The incidences of salmonellosis in Malopolska ranged from 30.3/100,000 inhabitants (2016) up to 25.4/100,000 (2014). There was a decrease in incidence of Rotaviruses in 2016 (32.3%) compared to 2015 and 15.2% compared to 2014. Also, there were observed a downward trend towards Noroviruses poisoning in 2016 by 3.5% compared to 2015 and an increase of 67.5% compared to 2014. Most food poisoning and infections in Bochnia in 2015 were caused by *S. enteritidis* and Rotaviruses - 86 persons. In 2014, only 4 poisonings caused by Rotaviruses were noted, while in 2016, for 19 persons, the etiological factors were Noroviruses, *S. enteritidis* and Rotaviruses.

Health education activities should always be expanded as part of the prevention of poisoning and food infections.



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