FOURTEENTH CONGRESS OF THE INTERNATIONAL FEDERATION OF INFECTION CONTROL (IFIC)

ABSTRACTS

12-15 March 2014
Hilton Malta Hotel
Portomaso, St Julian's, Malta

www.ific2014.com

Oral Presentations

O1 How to use ORION to plan and publish infection control intervention studies or outbreak reports

Sheldon Stone

University College London, Royal Free Campus, London, United Kingdom

The ORION statement is a CONSORT equivalent for infection control intervention studies and nosocomial outbreak reports. Its aims are to raise the standards of publication, increase transparency of reporting, provide a framework for reviewers & editors (and readers) to assess papers and offer criteria for research grant assessment panels.

Prepared by the authors of two systematic reviews undertaken for the HTA and the Cochrane Collaboration, the statement was revised following widespread consultation with learned societies, editors of journals and researchers. It consists of a 22 item checklist, and a summary table. It is useful for interrupted times series in particular as well as for RCTs and can be applied to a wide range of infection control interventions such as antibiotic stewardship programmes, and hand hygiene interventions.

The statement was endorsed and welcomed by professional societies and journals, published jointly in Lancet ID and Journal Antimicrobial Chemotherapy, and used by both SHEA and ECCMID for submission of conference abstracts. The first conference workshop on ORION took place at IFIC 2007, the first of many workshops at ECCMID and SHEA. Its website (www.idrn.org/orion.php) has the statement, the conference abstract version and educational materials and past workshops.

Like CONSORT, ORION considers itself a work in progress, which requires ongoing dialogue for successful promotion and dissemination. This lecture will hopefully contribute to this, providing a brief introduction including a worked example of a conference abstract presentation for the audience to try.

Organizational infection prevention and control risk assessment O2

Terrie Lee

Charleston Area Medical Center, Charleston, West Virginia, USA

Every healthcare organization faces many risks for transmission of infection, and may experience difficulties in setting priorities. A risk assessment process can assist in setting priorities and in establishing engagement and support from key stakeholders. The result can be a highly effective infection prevention and control program. In addition, the use of a progress report can be helpful for tracking activities on an ongoing basis, and for organizing and facilitating achievement of critical goals. This hands-on workshop will demonstrate the process of conducting a risk assessment, with a focus on strategies for success. A progress report will also be utilized for showing how to document and track accomplishments. Participants will have the opportunity to see practical applications of these concepts.

O3 National survey on sharp injuries in Bulgarian hospitals: current approaches for implementation of EU directive 2010/32

Rossitza Vatcheva-Dobrevska[1], Nina Gacheva[2], Vera Tabakova[3], Elena Topalova[1], Valentina Tzaneva[4], Tatiana Pejcheva[5], Teodora Tomova[5], Erka Andreeva[6], Violeta Dicheva[1], Virna-Maria Citu[1], Elizabeth Nadialkova[1], Maria Christova[7], Violeta Voynova[8]

[1]University Hospital Queen Joanna ISUL, Sofia, Bulgaria
[2]BulNoso Association for HAI Preventon, Sofia, Bulgaria
[3]University Hospital 'St Ekaterina' – Cardiovascular Diseases, Sofia, Bulgaria
[4]University Hospital Stara Zagora, Sofia, Bulgaria
[5]MBAL Burgas, Bulgaria
[6]MBAL 'Doverie', Sofia, Bulgaria
[7]NCIPD, Sofia, Bulgaria
[8]NPCMEH, MMA, Sofia, Bulgaria

Objective

To examine the needlestick/sharp injuries incidence and identify the associated risk factors among HCWs in Bulgarian hospitals.

Methods

A questionnaire anonymous survey among 402 HCWs in 5 hospitals. The dependent variable: the occurrence of needlestick/sharp injuries in the last year. The independent variables: protective equipment, HCWs/ hospital characteristics, factors associated with injuries, behaviour, system changes. The data were processed with SPSS 13.0; descriptive; graphical analysis.

Results

For the majority (51%) of respondents the weekly percutaneous interventions number are over 20. About 47% of respondents have no incidents during the last 12 months. The number of those having up to 5 injuries is significant - 176 /44%. Highest risk: taking venous blood - 70 cases, followed by suture- 53; i.v. injection - 51 cases. The largest number of punctures (median 6) is related to epidural/spinal anesthesia; suturing with 3.74; i.v. catetherization-3.46. The highest risk step is the needle recapping with 88 cases; discharge (56 cases); sewing - 49 cases. The majority (68%) of respondents always recapp the needles; 17% - never. Only 30% of respondents reported an accident. Working in surgical/operative units significantly increased the risk.

Conclusions:

The occurrence of needlestick/sharp injuries was associated with organizational characteristics, protective equipment, procedures, HCWs characteristics. They can prevent such injuries by establishing better work environment, resource adequacy, education; EU directive 2010/32 implementation, part of national HAI prevention standard; establishment of local monitoring system and national reporting system.

O4 IFIC survey on global practices related to disposal of faeces and urine

Walter Popp

Hospital Hygiene, University Clinics Essen, Germany

In 2012 the IFIC board approved a project to establish an online survey about the handling of human waste, specifically faeces and urine, worldwide.
Following an initial pilot survey, and building on the feedback received, the survey was launched using an electronic tool (SurveyMonkey), and also available for manual completion from forms distributed by collaborating partner MEIKO.
The programme started in July 2012, with a final closing date at end of April 2013.
The questionnaire was available in 8 languages: Spanish, French, German, English, Japanese, Thai, Chinese and Mongolian.
1,440 answers were received.
In total, 93 countries replied; most answers came from Germany, Canada, US, France, Australia, Thailand, Mongolia, India, China, UK and South Africa.

Some results:

- Toilet with water flushing system inside the hospitals is available in 79 %,
- The defaecation area / toilet is cleaned regularly with disinfectant in 57 %, with cleaning agent (detergent) in 41 %. No regular cleaning was in 2 %,

- If defacation had to be done in bed, the patient had to care for himself in 6 %, relatives or friends or caregivers were caring in 24 %, nurses in 76 % and other hospital staff in 41 %,
- If bedpans are used they are predominantly single use in 24 % and multiple use in 76 %.

Some hundred free answers were given, too, which confirmed the answers to the questionnaire very well. Also there are differences regarding continents and GDP products which will be discussed.

O5 The effective hospital epidemiologist

Richard Wenzel

Virginia Commonwealth University, Richmond, Virginia, USA

The hospital epidemiologist needs a broad portfolio of skills and tasks to be effective in the position. Credibility in the eyes of her colleagues requires the hospital epidemiologist to have basic skills and/or a deep appreciation of the clinical arena, biology (microbiology, pharmacology and genetics), population based studies (validity of tests and critique of the literature), and informatics (primarily access to information).

The first task afterwards is to be an effective leader in the infection control committee. To this author, it means the ability to make at least one important decision a month. Much of the work is done before the meeting with one on one conversations with individual committee members; the role of the Committee is then to vote on a key decision. Thereafter, on both a local basis and on a larger stage, the effective hospital epidemiologist would have an ability to be inspiring, to take on the big issues in the field, and to be persuasive. Furthermore, he or she would be an articulate teacher able to keep an audience informed about the changing field.

The best hospital epidemiologists have three more characteristics: the ability to manage something new; to manage intimidation; and to be creative.

O6 Novel techniques to identify outbreak causes and contributing errors

Evonne T. Curran

Health Protection Scotland, Glasgow, United Kingdom

Infection prevention and control teams (IPCTs) are tasked with preventing, preparing for, detecting and managing outbreaks. They have to do this in the context of an ever changing healthcare environment: the patients, environments and healthcare itself continuously changes and as a result different outbreak risks are presented to IPCTs. As a consequence IPCTs must also change and add to their outbreak detection and investigation tool-kits novel, or more sensitive methods, to identify errors, outbreak-provoking conditions and outbreak causes (outbreak transmission pathways). I do not pretend to hold all the answers and expect the audience to contribute to this presentation and share their novel solutions to improve outbreak prevention, preparation detection and management.
The key message is this: to have and maintain optimal capability to reduce the impact and incidence of outbreaks, IPCTs must continuously adapt their ways of working to their changing healthcare systems.

O7 Outbreak investigation in the context of organisational culture

Neil Wigglesworth

Public Health Wales, Cardiff, Wales, United Kingdom

Healthcare organisations are highly complex socio-technical systems sitting. Outbreaks of healthcare associated infection (HCAI) can be seen as the result of multiple and cumulative breaches in the layers of defence against error in a healthcare organisation's system. Human factors theory tells us that every aspect of a work system can impact upon human performance and [patient] safety. As well as local factors such as teamwork, communication and the interaction between healthcare workers and the equipment and environment around them, this inlcude the wider organisational and national policy context. The impact of organisation culture on patient safety,

including HCAI, has been clearly seen in examples such as the dramatic failings of the Mid Staffordshire NHS Foundation Trust (UK) and the resultant harm, including patient deaths.
This presentation will illustrate, using an example from the UK, how organisational culture and system failures can combine to create the circumstances for an outbreak of HCAI to occur. The lesson to be taken from this, is that infection prevention and control teams and professionals must explore and consider organisational culture and systems issues when investigating the causes of outbreaks.

O8 Introducing and managing change in infection control

Martin Wale

Vancouver Island Health Authority, Victoria BC, Canada

Infection control is a long-haul tough job, requiring personal resilience, a thick skin, and a sense of humour. Providing evidence-based standards and consistent, respected advice is central to safe and effective patient care. Yet change in healthcare is constant, driven by relentless and complex demographic, sociological, technological, economic, and political factors.
This presents a paradox – how do we introduce necessary, significant and sustainable change without front line staff feeling that hitherto sound, evidence-based policies or practices are suddenly altered or abandoned without good reason? This can lead to loss of confidence in the infection control team and the advice they provide, but worse, can leave infection control practitioners feeling confused, demoralized, or even betrayed.

This presentation will outline an approach to building a sound and workable approach to introducing and managing change, how to take the team along, and how to reassure and manage the expectations of front line staff and the executive team, using an example of major, rapid and sustained change in infection control in a complex health organization of 18,000 staff and 2,000 physicians. It will explore how the changes were developed and refined, and the importance of timing in implementation. Finally, the long-term impact will be analysed looking at both outcomes and sustainability.

Adapting change strategies to the local culture O9

Michael Borg

Mater Dei Hospital, Msida, Malta

It is not uncommon for infection prevention and control (IPC) interventions to be successful in one hospital yet fail, or have significantly less success, when identical attempts to implemented in another institution. This is not surprising. Despite dealing with biomedical practices, infection prevention and control remains essentially a behavioural science. Human behaviour is influenced by various factors, including culture. Culture has been described as the collective programming of the mind that distinguishes the members of one group or category of people from another. Within Europe, cultural models have explained between 25 to 50% of variance in infection related processes and outcomes. They provide a new insight to the multifactorial drivers that impact on HAI and offer possibilities of developing new or modified approaches to IPC strategies.
This presentation will give an overview how cultural influences, both national as well as organisational, can impact on IPC practices. It will highlight the potential pitfalls of "copy and paste" approaches in IPC and suggest potential ways of customising tried and tested strategies to different cultural backgrounds.

Using social marketing interventions to promote infection prevention and control behaviour O10

Senia Rosales-Klintz

Karolinska Institute, Stockholm, Sweden

New strategies are needed to effectively communicate infection prevention and control (IPC) messages and to engage health care workers in sustained IPC behaviour. Social marketing has been suggested as a useful tool to achieve this goal. Social marketing is a person-centred approach to promote social change (e.g. health improvement) by applying marketing theories

and techniques to plan, implement and evaluate interventions to induce voluntary behaviour change. There is limited but promising evidence of the social marketing's effectiveness in improving IPC. The aim of this presentation will be to discuss the benchmark criteria of social marketing (i.e. consumer orientation, segmentation and targeting, marketing mix, exchange and competition) and their potential application for IPC purposes.

O11 What's new in: Incidence and consequences of surgical site infections

William A. Rutala

University of North Carolina (UNC) Health Care and UNC School of Medicine, Chapel Hill, North Carolina, USA

Healthcare-associated infections (HAIs) are the most common complication affecting hospitalized patients. Between 5 to 10% of patients admitted to acute care hospitals acquire one or more infections (e.g., pneumonia, bacteremia, surgical site infection, urinary tract infection), and the risks have steadily increased during recent decades. These adverse events affect approximately 1.7 million patients each year in the United States, result in some 99,000 deaths, and add an estimated $4.5 to $5.7 billion per year to the cost of patient care. Infection control is therefore a critical part of patient safety as HAIs are the sixth leading cause of death in the United States.

This presentation will examine the incidence and consequences of SSIs. From January 2009 through December 2010, SSIs accounted for 23% of 69,475 HAIs reported to the National Healthcare Safety Network surveillance system by 2,039 hospitals in the United States. SSIs result in increased morbidity, mortality, and direct and indirect costs including increased hospital length of stay, readmissions for treatment including repeat surgical procedures, additional medications, lost productivity and temporary or permanent disability. Estimated average attributable costs of SSIs range from $10,443 to $25,546 per infection.

In the past several years there have been many efforts to reduce these infections. To prevent SSIs there have been several initiatives to include: national quality partnerships that address core measures (e.g., delivery of prophylactic antibiotics with 1 hour prior to incision, appropriate prophylactic antibiotic selection, antibiotic discontinuation with 24 hours post-op, appropriate hair removal); pre-admission shower (e.g., chlorhexidine gluconate); and intraoperative skin preparation with alcohol-based antiseptic agents.

With improvements in medical devices, standardization in key care processes using checklists or bundles with provider feedback, and a greater understanding of the science of infection prevention, safer healthcare in the 21st century is becoming a reality. Hopefully, these improvements will more than offset the challenges (e.g., aging population of hospital patients, growing frequency of antibiotic-resistant bacteria) in infection control in the future.

What's new in: Surveillance O12

Jacqueline Reilly

Health Protection Scotland and Glasgow Caledonian University, Glasgow, Scotland, United Kingdom

This presentation will look back over published surveillance papers in 2013 and horizon scan emerging issues in HAI surveillance. The key emerging issues in the field include:

Automation and meeting new needs for reporting. This includes the opportunity for improvement and efficiency and to reduce complexity, maintain clinical relevance and avoid case misclassification,

Recent large continent level PPS results informing: future priorities for incidence surveillance, reinforcing importance of validation studies, and developing IPC indicators to 'make sense' of surveillance.

The concept of surveillance data turned into intelligence for infection prvention and control, the added value of post discharge surveillance, and the emergence of non-infection prevention and control factors to explain variation.

O13 What's new in: Antibiotic stewardship?

Uwe Frank

Heidelberg University Hospital, Germany

The need for antibiotic stewardship has been addressed by several organisations, including IDSA, SHEA, and ASHP. Every healthcare institution should have a local, multi-disciplinary antibiotic management team that includes an ID physician, clinical pharmacist, microbiologist, IT-specialist, IC-professional, and hospital epidemiologist. New studies support even wider engagement, such as inclusion of local leaders of clinical specialties, in order to ensure sustainability. Nurses may get involved, since they are pivotal in administering antibiotics and may actively promote switching from IV to oral antibiotics. Compliance to recommendations as determined by antibiotic stewardship is essential. By identifying services that are less compliant, programs can target their educational efforts to improve outcomes. Introduction of antibiotic stewardship ward rounds and a dedicated prescription chart can achieve significant reduction in antibiotic consumption. Hospitals seeking to optimize antimicrobial prescribing may also consider utilizing mobile technology to deliver point-of-care decision support. Active pager alerting coupled with stewardship intervention can positively impact time to appropriate therapy and be a useful target. Recently, a clinical decision support tool to perform prospective audit and feedback comprised of an alert and navigator system featuring recommendations and educational information has been demonstrated to improve antibiotic use. Multifaceted educational initiatives reduce inappropriate antibiotic treatment of antibiotic-susceptible bacteria, and are a useful tool to fight CD-AD. A decrease in empirical antibiotic use has been observed after education, along with a decrease in the incidence of ESBL/AmpC-resistant K. pneumoniae infections. Timely notification from microbiology to the antibiotic stewardship team has resulted in improving the management of candidemia.

O14 What's new in: Prevention of IV device associated blood stream infections

Nizam Damani

Southern Health and Social Care Trust, Portadown, United Kingdom

In 1935, Dr. Werner Forssmann inserted a catheter through a vein in his arm into the right auricle of his own heart confirming that it was possible to access the heart using this method without invasive surgery. Since then, the use of central venous catheters (CVCs) is an integral part of patient care and is used for the measurement of central venous pressure, administration of total parenteral nutrition (TPN), delivery of fluid and administration of drugs that cannot be given safely by a peripheral catheter, and for haemodialysis. It has been estimated that nearly 3 million CVCs are inserted annually in the USA and about 250,000 in the UK.

However, insertion of both peripheral IV line and CVC carries a risk of both infective (e.g. local and systemic infections) and non-infective complications.

Catheter-related bloodstream infections (CR-BSIs) are associated with an increase in mortality risk by 25%, costing an average of US$ 16,550 per patient and prolong the hospital stay of patient up to three weeks. Recent evidence published suggests that with appropriate interventions, most if not all episodes of IV device associated blood stream infections are preventable.

This presentation will review the current evidence on the successful interventions to reduce IV device associated blood stream infections and share personal experience on the successes and challenges faced on the implementation of both peripheral IV lines and CVCs on a trust wide basis in two hospitals both in ICU and non-ICU settings.

O15 Behaviour strategies to improve infection control and antibiotic stewardship

Alison Holmes

Imperial College London, United Kingdom

The points to be discussed in this presentation will include:

- An understanding of practice and prescribing behaviour and context is needed to deliver effective infection prevention and antibiotic stewardship programmes,
- The opportunities for greater stakeholder involvement and better use of workforce,
- The need to frame infection control and antibiotic stewardship in terms of patient safety and quality of care,
- The potential role of 'mHealth' and the rapidly expanding potential applications for infection control and antibiotic stewardship.

O16 Pro-con debate: Laminar flow in orthopaedic operations

Pro: Peter Hoffman

Public Health England, London, United Kingdom

Con: Petra Gastmeier

Institute of Hygiene and Environmental Medicine, Charité-University Medicine Berlin, Germany

A large study (the Lidwell study observing 8,000 hip and knee replacements) published in the early 1980s showed that ultraclean air in laminar airflow theatres gave substantial protection from infection when compared to conventionally ventilated theatres, reducing deep infections by about half. But those observations were made over 30 years ago; much has changed. More recent very large epidemiological studies using surveillance data in Germany and New Zealand show that the infection rate associated with laminar airflow is actually higher than in conventionally ventilated theatres. This debate will set out the logic behind the studies and the application of these two systems. The use of laminar airflow to achieve ultraclean air comes at a high price, both to install and to maintain. When, if ever, can this cost be justified? This pro-con debate will highlight the current controversies, explore the available evidence, and help attendees to make decisions which are relevant to their countries and their hospitals.

Reducing MRSA bacteraemia in a high incidence setting - the Maltese experience O17

Michael Borg, Ermira Tartari, Deborah Xuereb, Noel Abela, Claire Farrugia

Mater Dei Hospital, Msida, Malta

Bloodstream infections (BSI) caused by methicillin resistant Staphylococcus aureus (MRSA) constitute a major challenge to healthcare institutions, particularly in terms of associated mortality and economic costs. Improvement in MRSA BSI incidence has been shown to be achievable through effective infection prevention and control interventions within hospitals.

An 900+ bed facility, Mater Dei Hospital provides all the tertiary medical hospital in Malta. For many years, in common with many other institutions in the Mediterranean and South-Eastern European region, it reported consistently high incidence rates for MRSA BSI of almost 2 cases per 10,000 bed days. In 2010, the hospital spearheaded an intensive campaign aimed at reducing MRSA BSI. The cornerstone of this initiative was the use of root cause analysis to identify preventable causes behind MRSA BSI and implement effective corrective actions across the organisation. The campaign had a significant impact with a sustained 50% reduction achieved in less than 5 years. Healthcare associated MRSA BSI was reduced to 0.8/10000BD, despite a high prevalence of MRSA carriage in the community and nursing homes.

The session will describe the strategy components that are credited to have achieved this success, including:

- Root cause analysis methodology and implementation of corrective actions,
- Hand hygiene initiatives,
- Peripheral cannula management,
- Central venous catheter care,
- Prevention of MRSA BSI in renal dialysis patients.

O18 Hospital mortality related to healthcare associated infections. A retrospective study in a large Norwegian tertiary and teaching hospital

Per Bjark, Egil Hansen, Egil Lingaas

Oslo University Hospital, Norway

Measuring hospital quality through monitoring adverse events (AE) and hospital mortality is under debate. A Norwegian study using Global Trigger Tool (GTT) has shown alarming figures of hospital deaths due to AE. In 2010 32,7% of all deaths in hospitals were claimed to be due to AE. Healthcare workers in clinical practice have questioned these results. The aim of this study was to identify all deaths due to AE during one calendar year in a Norwegian university hospital, with special attention to deaths due to infection as defined by CDC. Estimated life expectancy without an AE was judged according to a modified McCabe model. Oslo University Hospital is a 1400 bed tertiary care teaching hospital with approximately 1400 somatic beds. In 2011, 82341 unique patients were hospitalized one or more times and 1126 patients died during hospital stay. Records for all patients were reviewed, recording all AEs and their relationship to patient death. 142 adverse events were identified in 137 patients (12,2%), and in 58 (5.15%) life expectancy was judged to be > 1 month without an AE. HAI were identified in 98 (8.7%) of the deceased patients, and 35 (3.1%) of these were expected to live > 1 month if the infection had not occurred.

Conclusions

Our findings show that 35/82,341 (0.04 %) inpatients died due to an HAI which shortened expected survival with more than 1 month. Correspondingly 23 (0.03%) patients died of other AEs. These are significantly lower rates than those estimated by GTT.

O19 Adenovirus conjunctivitis; an approach to contain it within an "outbreak"

Janette Morlese, Ramona Rodrigues

McGill University Health Center, Montreal, Canada

Introduction/Aims

The ophthalmology clinic nurse at McGill University Health Center reported an unusual increase in cases of adenovirus conjunctivitis. She estimated 8 cases occurring over several weeks which included an ophthalmology resident. The infection control team was consulted for assistance to investigate the outbreak. The objective was to identify the source of the adenovirus transmission and implement measures to prevent further cases.

Intervention

All patients visiting the clinic during the time period and all staff were identified. A review of clinic practices was initiated. All opened multiuse eye drops were discarded to eliminate a possible reservoir. A total cleaning of the department was requested. Charts of 146 suspected cases were reviewed to define the case definition.

Results

There were 2 laboratory confirmed adenovirus cultures, 10 of 146 cases reviewed fit the case definition of which 2 were staff. Audits showed poor compliance with hand hygiene and inappropriate Tanometer prism cleaning. The instrument kit used for out-of clinic consults contained unclean instruments. Staff education on hand hygiene was provided and additional hand sanitizers installed throughout the clinic. A new protocol for cleaning and disinfection of Tanometer prism was implemented. Clinic patients with suspected conjunctivitis were isolated on arrival.

Conclusion

The hypothesis was that the ophthalmology resident was likely the index case and a patient likely the original source. No new cases were identified 14 days after the last suspect case. The measures recommended by the infection control team were effective in controlling the outbreak and preventing new cases of Adenovirus conjunctivitis.

O20 Introduction of a "bladder bundle" to reduce catheter associated urinary tract infections (CAUTI) in neurology patients

Susan Rachel, Ramona Rodrigues

McGill University Health Center, Montreal, Canada

Introduction/aims

Surveillance data for CAUTI demonstrated significant inappropriate catheter use and lack of physician follow up for catheter removal on the unit. The mean catheter dwell time was 11.2 days although the literature states that catheterization beyond 6 days poses significant risk for CAUTI. Many neurology patients cannot maintain normal urinary elimination patterns because of dysfunction at the brain-stem, spinal or cerebral levels. Unreliability of fever complicates diagnosis of infection. Our objective was to design an evidence-based, sustainable prevention program to decrease CAUTI rate and inappropriate catheter use.

Interventions

A detailed review of current literature shows that grouping, or making a "bundle" of evidence-based preventive practices has seen more success in improving patient care than when each practice is implemented individually. Following these guidelines, we implemented the "5 A's Bladder Bundle" including a "nurse-initiated catheter reminder sheet".

Results

The rate of inappropriate catheter use dropped from 69.3% in the first four weeks to zero for the last 5 weeks of the implementation phase of the bundle. Six quarterly audits have shown sustainable results.

Conclusions

Using the bundle philosophy of implementing several best practices at once has proved very efficient and results are sustainable. Elements for success were "staff buy-in" and consistently using the bundle for "every patient, every time". The cost savings for reducing CAUTI on this unit will be substantial and has had a very positive impact on promoting patient safety.

O21 Tuberculosis in Valle d'Aosta, 2008-2012: a comparison of administrative data with notifications and hospital risk for healthcare workers

Roberto Novati

Regional Hospital, Aosta, Italy

Valle d'Aosta is a small Alp region with one hospital, one health agency and a population of about 127,000; we studied TB epidemiology there in 2008-2012 by both notifications and administrative data; furthermore, in-patients tracing was done, to assess risk of transmission to HCW's. Clinical charts from patients with a diagnosis of TB (ICD codes 010 to 018) were collected, reviewed to check disease features and patient location then compared with notifications sent to the public health agency. As a whole, TB incidence since 2009 to 2012 was 9,5- 10,9- 6,2- 5,5 and 11,8 cases for 100,000 respectively and more than double than the national one. Overall, 78 patients were identified by ICD codes, 17 with history a previous TB. Of the remaining 61, 27,8% were cared as outpatients and identified by notifications. Hospital patients were 44, 36,4% had extra pulmonary TB, 27,3% pulmonary sputum negative and 31,8% pulmonary sputum positive TB; 20,4% of the 61 were not notified and captured thanks to ICD codes, 5 of them had pulmonary TB. Finally, five sputum positive patients were admitted outside infectious disease ward before the diagnosis was done, for a time period ranging from 12 hours to 14 days. Adding ICD hospital data to notifications better approaches the real TB spread, but requires strict collaboration between hospital and the territory. At hospital level we suggest to look for TB ICD codes regularly and to give feedback to HCW, to increase awareness in TB-related risks and avoid mistakes in patients' location.

O22 Outbreak with Ralstonia pickettii caused by contaminated magnesium vials

Birgit Ross, Jörg Steinmann, Jan Buer, Walter Popp

University Hospital Essen, Germany

Objective

In February 2013, 5 patients in an intensive care unit (ICU) were found to have positive blood cultures with Ralstonia pickettii within one week. Because all patients got intravenous therapy, improper work staff was suspected. Some days later, a 6th patient was found with a positive blood culture of Ralstonia pickettii in another department of the hospital.

Methods

Hygienic investigations showed no evidence of failures in preparation of intravenous therapy. All patients received different intravenous drugs, but every patient received glucose 5% and magnesium i.v. We examined samples of glucose and magnesia as well as samples from environment.

Results

Glucose and magnesium samples were examined by membrane filter method. Ralstonia pickettii was detected in some magnesium vials. Environment samples showed no growth of Ralstonia pickettii.

Conclusion

We concluded, that contamination of magnesium vials might have been the reason for blood stream infection of patients. State authorities and the producer were informed and all vials were collected in our hospital and replaced by vials from another company. Later a nationwide recall of magnesium vials was performed by the producing company. No further Ralstonia pickettii was found in blood cultures in our hospital.

O23 Environmental cleanliness and antimicrobial stewardship: a regional initiative to reduce hospital-acquired infections

Sydney Scharf, Elizabeth Bryce

Vancouver General Hospital, Canada

A regional initiative focusing on antimicrobial stewardship and environmental cleaning in an effort to reduce healthcare associated infections (particularly Clostridium difficile) was introduced at three sister hospitals in 2012. The implementation, challenges, and successes of the environmental program at year one are outlined. The environmental program aimed to reduce hospital clutter and improve cleaning of surfaces and patient equipment. Key elements of the program included decluttering campaigns, adjustment of cleaning staff schedules to meet bed access requirements, redesign of housekeeping carts, recycling programs, sharing of equipment across facilities, and equipment depots for storing excess items. Mobile equipment was barcoded to facilitate tracking both for monitoring cleanliness and for ease of maintenance. A „green means clean" campaign to increase awareness of the need for equipment disinfection was introduced. Site specific teams with multidisciplinary membership were introduced to respect facility culture, adjust measures to suit local context, and encourage local innovation. First year successes include:

1) an illustrated manual outlining roles and responsibilities for the cleaning of shared patient equipment;
2) the creation of equipment management programs at each site and
3) removal and/or repurposing of several tons of obsolete equipment.

At the primary hospital, there has been a 21.3% reduction in the number of CDI cases. Collaboration continues with the transfer of ideas and knowledge between the three sites ensuring sustainability and continuing improvement.

O24 Intelligent electronic tools for automated surveillance and feedback, for audit and networking – a significant step towards evidence-based IPC in intensive care

Walter Koller[1], Klaus-Peter Adlassnig[1], Andrea Rappelsberger[1], Philipp Meng[2], Alexander Blacky[1]

[1]Medical University of Vienna, Austria
[2]Linz City General Hospital Ltd. (AKh Allgemeines Krankenhaus der Stadt Linz GmbH.), Austria

Safety and quality structures as required by modern healthcare can be managed best with intelligent information and communication technologies (ICTs). The more they rest on fully automated and intelligent data and knowledge management the better they support quality assurance, benchmarking, error prevention, and implementation of best practice methods. Our example is automated surveillance, monitoring, and reporting of HAIs for which we developed and use MONI, an intelligent ICT system for 14 intensive care units at a tertiary hospital. Fully automated detection and monitoring systems not only can assess HAIs more precisely with less time investment than conventional surveillance systems. They do it always the same way as data processing automatically follows the electronically implemented rules. Once in place, they function regardless of human factors which often impair reliability and continuity of conventional surveillance. They may also be adapted to new rules for data interpretation as additional input or new surveillance output emerges or is required by clinicians, administrators, and health authorities. Definitions of different networks can be used in parallel. Along with good documentation of such changes, this setting is perfect for quality control and audit in the long run. Availability of computer-based systems and networking grows rapidly throughout the globe. Especially in countries of lower income, mobile client-based solutions can substantially improve healthcare with high cost-effectivity, remote clinical decision support for health workers in rural African regions being an existing example. Propagation of intelligent ICT tools seems promising also in low resource environments.

The burden of surgical site infections worldwide O25

Benedetta Allegranzi

World Health Organization, Geneva, Switzerland

Recent work by the World Health Organization (WHO) shows that surgical site infection (SSI) is the most surveyed and most frequent type of healthcare-associated infection (HAI) in low- and middle-income countries, affecting up to one-third of operated patients. Pooled incidence of SSI was 11.8 per 100 surgical procedures (range, 1.2 to 23.6) in developing countries. Among the highest rates, studies conducted in Nigeria and Kenya reported that wound infection affected 24% and 19% women undergoing caesarean section. The gaps in our understanding of these high rates include poor data reliability from many countries, inexistent surveillance systems and lack of standardized definitions and of information to classify SSI according to risk categories. By contrast, SSI rates vary between 1.2% and 5.2% in high-income countries. Although SSI incidence is much lower in these countries, it is the second most frequent type of HAI in the USA and Europe and the most frequent type in some European countries. While advances have been made in best infection control practices implementation, SSIs remain a substantial cause of morbidity and mortality among hospitalized patients. In one study in the USA, among nearly 100,000 HAIs reported in one year, deaths were associated with SSIs in more than 8,000 cases.

The presentation will provide an overview of SSI epidemiology worldwide based on recent and still unpublished systematic reviews conducted by WHO, including evaluation of any different risk factors, infection frequency, and impact in terms of mortality and costs between low-/middle-income and high-income countries.

O26 Surgical site infection prevention: the WHO perspective

Joseph S. Solomkin

University of Cincinnati College of Medicine, Cincinnati, Ohio, USA

SSI is a very frequent complication of surgical procedures, especially in low- and middle-income countries.

Integration of a range of preventive measures before, during and after surgery has been shown effective to significantly reduce the occurrence of SSI. New developments have occurred in this field over the last years. For instance, the dissemination of the World Health Organization (WHO) Safe Surgery Checklist has become widespread but no comprehensive assessment of best ways of implementing it in different settings is available yet. Likewise, interventions based on bundles of recommended preventive measures have led to significant results but these studies should be assessed against criteria for evidence strength and the best approach identified. In addition, recently developed implementation science approaches could add value to overcome barriers and facilitate healthcare workers' behavioural change needed to translate recommendations into practice in the operating theatre. The implementation of many of these measures is not standardized around the world and inconsistency in evidence interpretation and in recommendations among national guidelines has been identified. Although some national guidelines exist, no international guidelines are available. Finally, a major gap in available guidelines is the lack of implementation strategies. No available guidelines evaluated the evidence about the most effective strategies to translate recommendations into practice.

For these reasons WHO considers a priority to tackle SSI prevention in a global perspective and is leading a project involving assessment of the available evidence and the related quality, and development of guidance to support the implementation of standardized measures for SSI prevention.

Surgical site infection prevention in settings with limited resources O27

Nizam Damani

World Health Organization, Geneva, Switzerland

Although the global burden of healthcare associated infections (HCAIs) remains unknown due to difficulty of gathering reliable data, it has been estimated that any given time, the prevalence of HCAIs in developed countries varies between 3.5% and 12%. According to data analysis by WHO, pooled HCAIs prevalence in mixed patient populations was 7.6% in high-income countries between 1995 and 2010. Recent work by the WHO First Global Patient Safety Challenge „Clean Care is Safer Care" programme (http://www.who.int/gpsc/en) shows that surgical site infection (SSI) is the most surveyed and most frequent type of HCAIs in low- and middle-income countries, affecting up to one-third of operated patients. Pooled incidence of SSI was 11.8 per 100 surgical procedures (range, 1.2 to 23.6) in developing countries.

In addition to operation performed by experienced surgeon using good surgical technique, in order to prevent/minimize post-operative surgical wound infections, it is important that the surgical team must create a safe environment by controlling four main sources of infection i.e. personnel, equipment, the environment and patient's risk factors.

The presentation will discuss the pre-operative, intra-operative and post-operative factors to reduce surgical wound infections in limited-resource settings.

Reference: WHO Report on the Burden of Endemic Healthcare-associated Infection Worldwide. Geneva: World Health Organization, 2011.

O28 Scientific guidelines as a key component of change: the French experience

Pierre Parneix

South-Western France HAI Control Centre - SF2H, Bordeaux, France

How to implement guidelines is the daily challenge of infection control teams (ICT). Many strategies and models are well designed and numerous tools are available with the blooming field of training-based simulation. But we must keep in mind that the initial starter of improvement is the guidelines themselves.

In France the first guidelines on endoscopes disinfection were released in 1992 by the French Society for Hospital Hygiene (SF2H). This was a starting point of a long process of quality management and improvement leaded by ICT. When practices were firstly assessed in 1995 in hospitals of southwestern France there were 8.3% of the procedures performed without cleaning or disinfection. In 1996 the French health authorities relased a legal statement including the SF2H guidelines. Further audits found that the non quality practice rate has dropped to 3.3% in 1997 then to 0% in 2007.

In 2011 the SF2H also evaluated barriers to adherence to best practices for peripheral venous catheter management. Time consumption, lack of perceived efficiency and ignorance were among them.

As the workload has increased in hospitals, guidelines should focus on the main targets of safety aspects. Through the years the evidence-based medicine helped us to design more accurate recommendations and to simplify them. We experienced the GRADE method in this purpose in the 2013 revision of our preoperative infection control guidelines.

In conclusion, scientific societies working in the field of infection control have been often the starters of quality improvement through guidelines production and still should be.

O29 Law, structure and behaviour – experiences from Germany

Walter Popp

Hospital Hygiene, University Clinics Essen, Germany

In 2011, a federal law on hospital hygiene was changed in Germany. One of the results is that the number of hygiene nurses has to be doubled and also more hygiene doctors are necessary now.

Since around ten years outbreaks are very interesting for public media, especially in neonatology. There were some outbreaks with far-reaching consequences, e.g. administration heads loosing their jobs. Also this led to central decisions in Germany regarding numbers of staff (1:1 nurse:baby from 2017 on) in neonatologic wards. Especially during outbreaks it was seen that there is a strong influence of the number of qualified staff and also of hospital contruction issues. More outbreaks are often seen in ICUs with no clear leadership. Also a lot of initiatives have been started during last years to raise compliance, e.g. in hand hygiene. Some success has been shown.

As a consequence it seems from German experience that most important is law and its implementation, second is structures (like hospital construction, leadership and staff numbers) and third are campaigns for motivation and compliance.

O30 Law, structure, audits and behaviour – experience from Mongolia

Tsagaan Gantumur

Medclean Ltd., Ulaanbaatar, Mongolia

Mongolia is a country with area of 1.5 million square kilometers and populations of around 2.8 million and very harsh winter. Economic activity in Mongolia has traditionally based on herding, although Mongolia is a nation experiencing rapid economic growth as a result of a mining boom. However, it faces considerable social, political, legal, educational, economic challenges in improving its medical system.

The public health in Mongolia was born in the 1921 after the changing of the political situation under the influence of the UdSSR and the Western medical knowledge was introduced first time through the Russian medical professionals in a country with solely Buddhist- Tebitan medicine.

Nowadays the infection prevention control in Mongolia is structured in 3 levels, namely:

- Coordination Committee on IPC at the Ministry of Health,
- Committee on the IPC at the National Center for Communicable Disease,
- IPC commission at all health facilities.

In 2011, the country developed Infection prevention and control strategy (2012-2016). The donor organization, such as WHO, ADB, the Global Fund to Fight AIDS, Tuberculosis and Malaria (GFATM) and the Mongolian emergency hospital hygiene project (MehHp) from German- Mongolian cooperation support the infection prevention and control in Mongolian hospitals.
Alongside these improvements we still have problems such as:

- Information on hospital-acquired infections of antimicrobial resistance is still poor, and misuse of antibiotics is common,
- Infrastructure to support effective IPC is problematic such as lack of running water in as many as 75% of countryside hospitals,
- Lack of the cooperation decision makers, doctors and IPC practitioners is problematic of hospital hygiene.

O31 Using behavioural change as a tool to reduce healthcare associated infection in a low resource setting

Namita Jaggi, Pushpa Sissodia

Artemis Health Institute, Gurgaon, India

Introduction

Infection prevention is an old science but a new art. The reasons for non-compliance to infection control practices in healthcare settings are related to psychological barriers, preconceived notions, cultural influences and ineffective time and resource management. Can we use behavioral change as a powerful tool to improve infection control practices and reduce healthcare associated infections (HAI)?

Interventions

This study was carried out for one year from July 2012 to June 2013. 24 infection preventionists were identified. A baseline assessment of their awareness and compliance in infection prevention was undertaken followed by understanding the psychological blocks by a trained psychologist who then addressed the issues. A post training assessment was conducted and results statistically analyzed.

Results

19 of the 24 (79%) showed significant improvement ($p<0.05$) in all aspects of competency in infection prevention. A positive correlation was observed between the compliance to infection control practices and decrease in HAI.

Conclusions

Understanding human behaviour leading to low compliance to infection control practices and imparting training to overcome these blocks can be a powerful, cost effective and a rational approach to reduce HAI in low resource settings.

O32 Evaluation of the effect of some of the currently used disinfectants on *Pseudomonus Aerogenosa* causing nosocomial infections

Moustafa Abdelnasser, Mohammad Yosery Salah El-Dakhakhny, Mohammad Moustafa El-Saadawy, Mohamad Abdeldaziz Ebrahim, Mohamad Shees Ahmad, Ashraf Abdallah Soliman

Al-Azhar University, Cairo, Egypt

This study was carried out to assess the efficacy of some of the currently used disinfectants on *P. aeruginosa* causing nosocomial infections. Seven disinfectants were selected; namely, Clorax (5.25% of sodium hypochlorite) and Cidex (2% glutaraldehyde) (commonly used in hospitals) and five of the new introduced disinfectant agents namely, Lysoformin

(Glyoxal [7.5 gram]+ gluteral [9.5 gram] + di-dectyldimethyl ammonium chloride [9.6 gram] /100 ml), Micro 10 (19 gram alkyl-benzyl-dimethyl ammonium chloride/100 ml), Persafe (0.26% peracetic acid + 3% hydrogen peroxide), Sanosil (hydrogen peroxide 50% + silver [0.05%), and Virkon (potassium peroxo-monosulphate-potassium hydrogen sulphate sulphamic acid-sodium hexa-metaphosphate-sodiumchloride). A standardized suspensions of 25 clinical isolates of *P. aeruginosa* strains were tested against different concentrations of each disinfection at different contact times. The minimal bactericidal concentration (MBC) of each disinfectant was determined. Most of *P. aeruginosa* strains were sensitive to the current and the new generations of the tested disinfectants. It was also found that the tested disinfectants were still active below the concentrations recommended by the manufactures. The study, however, could not recommend shifting from these concentrations because some articles may be contaminated with organisms other than *P. aeruginosa* (e.g., mycobacteria, etc.) which may need more contact times and concentrations.

O33 Evaluation of surgical instrument and medical device decontamination and sterilisation practice in healthcare facilities

Boniface Hakizimana[1], Magda Mocke[2]

[1]Stellenbosch University, Tygerberg, South Africa
[2]UIPC/Tygerberg Hospital, South Africa

Background

Effective cleaning and disinfection/sterilization using a properly validated washer-disinfector/sterilizer will protect patients and staff from infection; prolong the life of the equipment and ensure the quality of the diagnostic/therapeutic procedure. The purpose of this study was to evaluate how dirty items were handled and cleaned, how clean items were inspected, wrapped, sterilized and how was validation carried out. An audit of the CSSD facility was also conducted.

Methods

This study was conducted at Tygerberg Hospital during the period 18 June to 18 July 2013 as part of the intermediate course module in decontamination and sterilisation for postgraduate diploma in infection prevention and control. This was a descriptive survey, whereby an audit tool and other observational tools for capturing the required information were developed and used to collect information. CSSD and endoscope units were visited. Inventory of CSSD equipment, wraps, instruments, detergents/disinfectants was conducted and analysed.

Results

The audit conducted at CSSD between 21 June and 5 July 2013 indicated 87.3% compliance with existing CSSD protocol. The control of instruments before and after use was not documented in 37.3% and 59.6% cases respectively. There was adequate equipment, appropriate and adequate wraps. Most of detergents used for cleaning of instruments were out of date. The shortage or stock out of most of surgical instruments was also noted. The observed endoscope manual cleaning practices were not safe. There was lack of displayed written SOPs for reusable instruments onwards, endoscope manual reprocessing, and for manual cleaning of instruments in the CSSD.

Conclusion

A good programme of decontamination and sterilization was observed in the CSSD of TBH. However, some improvements are still needed such as proper use of detergents, hand hygiene practice, manual cleaning of endoscopes and records keeping. Regular staff training, providing of required SOPs, regular monitoring and evaluation of activities should also be tackled to further improve compliance levels in the CSSD.

Personality traits of healthcare professionals common to hand washing neglectors O34

Sergejs Kuznecovs, Galina Kuznecova, Luiza Gromcakova, Ivans Kuznecovs

Preventive Medicine Institute, Riga, Latvia

Aim

Cross contamination in hospitals could be prevented by hand washing. Even in the very well equipped

hospitals with guidelines and regular audit there are some healthcare workers (HCW) still in the dark ages about hand hygiene. The aim of the present study was to investigate the personality traits of HCW neglecting hand washing.

Methods

The information was gathered using a questionnaire combining social support questionnaire and life experience survey and Hogan Development Surveys (HDS). A total of 76 doctors and nurses from hospitals and medical centres in Latvia, violators of hand hygiene were surveyed.

Results

Many personality traits are generally accepted as common to hand washing neglectors. A list of the traits: defiant (96%), arrogant (92%), withdrawn (914%) fear-full (90%), restless (90%), irritable (88%), discontent (87%), thwarts authority (87%), demanding (86%), chameleon (83%), complainers (82%), compulsive liar (90%), self-blame (75%).

Conclusion

It was found that violation in hand hygiene could exacerbated or even caused by personality factors, specifically by high levels of neuroticism, low levels of extraversion and low levels of conscientiousness. These traits are dimensions that could be a part of the model of personality in hygiene violations. It is possible to use HDS for selecting healthcare workers for hygiene education with specific motivation and additional control.

O35 Surveillance of infections in nursing homes (NH) in the Netherlands, how to come from information to action

Anja Haenen, Marie-Jose Veldman-Ariens, Jeroen Alblas , Sabine de Greeff

Netherlands National Institute for Public Health and the Environment, Bilthoven, The Netherlands

Background

In the Netherlands, there are approximately 400 nursing homes within total 61.000 residents. Since 2009, the national sentinel Surveillance Network on Infectious diseases in nursing homes (SNIV) registers weekly the number of new infections in participating Nursing Homes. The aim of the SNIV network is to provide systematic year-round surveillance data to gain insight in infections in nursing homes and to provide tools for local interventions to optimize infection control. On a national level the surveillance helps to develop infection control guidelines for nursing home setting.

Methods

Infections are registered in a web-based application. The type of infections registered are: gastro-enteritis, influenza like illness, probably pneumonia and urine tract infections. Registration of an infection is based on a clinical case definition developed in collaboration with elderly care physicians. In addition, information regarding the organization in the NH was collected. Weekly incidence rates were calculated by dividing the total number of cases in one week by the total number of residents in the participating nursing homes in that week (resident-weeks). 95% confidence intervals were calculated for the annual incidence rates.

The participating nursing homes get a feedback report every year where they can compare their results with nursing homes with the same characteristics.

Once a year a meeting is organised for participants with state-of-the-art lectures on the infectious disease under surveillance. Four times a year, newsletters are sent to all persons involved with an update of the national nursing home infection incidence and information about the infectious disease under surveillance and related projects. The newsletters are published on the website together with an overview of the data collected in each year.

Results

In 2009, 2010, 2011 and 2012 respectively 25, 28, 24 and 19 nursing homes participating in the network. Table 1 shows the characteristics of the participating nursing homes.

The incidences per 1000 resident weeks for each infectious disease from 2009 till now are given in table 1.

Table 1: Characteristics of participating nursing homes

	2009	2010	2011	2012
Nursing homes (N)	25	28	25	19
Bed capacity (median; range)	159 (62-284)	129 (41-234)	150 (60-284)	134 (60-234)
Total number of resident weeks	177677	158628	136746	109452
Facility rooms (median; range)	5 (1-13)	5 (1-18)*	5 (1-18)	6 (1-20)
Interchange of personnel between wards % (regularly versus incidental)	51%	33%	16%	31%
Private rooms versus multiple person rooms (>=50%)	14%	49%	59%	76%
Private bathroom versus shared bathroom (>=50%)	0%	9%	24%	33%
Influenza vaccination coverage personnel (median; range)	18% (4%-52%)	19% (5%-50%)	23% (4%-65%)	19% (5%-50%)
Influenza vaccination coverage residents (median; range)	91% (70%-99%)	90% (70%-98%)	92% (70%-100%)	90% (70%-100%)

	Gastro-enteritis	Influenza like illness (ILI)	Probably Pneumonia	Urine tract infections
2009	3.8	1.6	3.6	-
2010	4.6	0.4	3.7	-
2011	3.7	0.5	2.9	8.0
2012	2.5 (0.0-7.8)	1.8 (0.0-17.8)	3.5 (0.19-12.0)	9.6 (0.3-21.2)

Table 1: mean incidences per 1000 resident weeks per infectious disease per year

UTI are the most common infections found in SNIV. But the range in incidences varies per nursing home so every nursing home has its own point of interest.

The preliminary results show:

- The incidence of gastro-enteritis showed a seasonal pattern with peaks in winter.
- Nursing homes with regular interchange of personnel between wards had higher incidences of gastro-enteritis.
- Nursing homes with higher seasonal influenza vaccination coverage among personnel had lower incidences of influenza like illness.
- Nursing homes with higher percentage of private bathrooms had higher incidences of probable pneumonia.

Conclusions

There are national guidelines for infection control in the Netherlands but given the variety in NH, every nursing home has to implement their own plan to reduce infections based on the national guidelines.
The reports are a helping hand to improve local infection prevention policy. The incidence rates of each nursing home show them the effect of their prevention policy.

UK MRSA and C. difficile decline: better infection control or simply natural evolution?

O36

Michael Cooper

Royal Wolverhampton NHS Trust, United Kingdom

Ten years ago, increasing numbers of MRSA bacteraemia, then C. difficile infections, were seen across the UK. Mandatory surveillance in England confirmed a continued rise in the numbers of both conditions. Following pressure from patient action groups (and the popular press), the government attempted to increase the priority given to infection prevention and control in hospitals. This resulted in the setting of HCAI targets for individual healthcare institutions. These targets were initially met with

scepticism by many infection prevention and control practitioners, who thought such a profound reversal in the trend of increasing MRSA and C. difficile numbers was unachievable in the UK healthcare system. Help from the Department of Health, plus the open publication of league tables of results introducing the threat of adverse publicity, then financial penalties for organisations failing to hit their targets coincided with a steep and sustained decrease in numbers across England. This improvement, however, has not always been mirrored by improvements in other HCAIs. It is possible that the UK was experiencing an epidemic of MRSA and C. difficile, and the reduction in numbers is merely due to regression to the mean, or changes in the prevalent strains or pathogenicity of the organisms involved. I shall present the evidence for and against this argument, and discuss possible confounding factors, such as screening, selective or restrictive testing or reporting and the influence of changes in laboratory protocols over this time period.

O37 Which UK initiatives worked in achieving behaviour change and which were not so succesful?

Neil Wigglesworth

Public Health Wales, Cardiff, United Kingdom

In the United Kingdom, since devolution, health and healthcare policy has been the responsibility of the devolved governments and administrations of the UK's 4 constituent countries. The National Health Service remains largely a public sector body and healthcare continues to be free at the point of use across the UK; but despite this, significant structural and policy differences exist between countries. Examples include the presence or absence of a commissioner-provider split and charges for prescriptions. Differences in approaches extend to policy initiatives and structural mechanisms in the area of healthcare associated infections (HCAI). Such differences include the emphasis placed on 'targets' for specific infections, such as Meticillin resistant Staphylococcus aureus (MRSA) bacteraemia, the creation of new statutory requirements for healthcare providers, the use of commissioner-provider mechanisms to manage 'performance' and financial incentives or penalties.

Using two of the four countries as examples, England and Wales, this presentation will compare the structural and policy initiatives of their respective government health departments and look to identify their impact in each country. The impacts considered will include HCAI outcomes and the presentation will include speculation, reflection and observation about the behaviour change effects of a number of specific initiatives.

O38 Were the comprehensive antibiotic stewardship programmes effective in changing prescribing practice?

Carole Fry

Department of Health, London, United Kingdom

Antimicrobial resistance is recognised as a global health threat. Increased use of antimicrobials is associated with an increase in resistance. Antimicrobial stewardship is an important tool to foster the responsible use of antimicrobials.

This presentation will describe initiatives within England to promote responsible antimicrobial prescribing, which includes:

- Start smart, then focus – stewardship guidance for secondary care which should form part of an organisation's quality improvement strategy for patient safety, to help reduce inappropriate prescribing and optimise antibiotic use.
- TARGET (Treat Antibiotics Responsibly – Guidance and Education Training) toolkit developed by the Royal College of General Practice and Public Health England in collaboration with professional societies and other stakeholders. The aim of the toolkit is to become a central resource for clinicians and commissioners about safe, effective, appropriate and responsible antibiotic prescribing, and helping to fulfil CPD and revalidation requirements.
- Antimicrobial prescribing and stewardship competences which can be used by any independent prescriber to help develop their prescribing practice at any point in their professional development in relation to prescribing antimicrobials.

Data will then be presented on antibiotic consumption data over the period that these initiatives were introduced together with a discussion of what else can be done in future to promote responsible prescribing.

O39 Operating theatres

Hilary Humphreys

RCSI and Beaumont Hospital, Dublin, Ireland

Within operating theatres, there are many accepted traditions underpinning strategies to prevent infection post-operatively. Many have arisen over time without a solid evidence base, e.g. patients changing trolleys on arrival into the operating theatre complex but others make intuitive sense and or have an evidence base e.g. theatre scrubs. With the increasing sophistication of surgical techniques such as laparoscopic surgery and a greater emphasis on healthcare costs, there is greater scrutiny of what can and should be done within theatres. Recent surveys have suggested that ultra-clean ventilated (UCV) or orthopaedic theatres may be associated with increased and not reduced rates of post-operative surgical site infections (SSI), in contrast to the initial UK trials thirty years ago. Increased SSI rates may arise from the inappropriate use of UCV or poor theatre discipline. For minor surgery in an acute hospital or in primary care, artificial ventilation may not be required as good operative techniques and standard precautions may suffice given the low risk of infection. Also, various practices that relate to surgical technique may also be important in minimising infection, e.g. cavity drainage procedures, use of local antibiotics, etc., but there are few quality studies. With the move to greater and more comprehensive post-operative surveillance for some procedures in many countries, aspects of theatre practice should be included in the surveillance database to determine their importance because multi-centre trials on these issues would be very difficult to conduct.

Cleaning O40

Peter Hoffman

Public Health England, London, United Kingdom

The importance of environmental cleaning as a component of infection control is controversial. The majority of the environment is either in contact with intact skin (low risk) or not normally in contact with the patient at all (minimal risk). Routine cleaning of patient areas is probably not that important (controversial); terminal cleaning after a colonised or infected patient has vacated a room is probably important (not controversial) and prompt clearance of blood or body fluid spill is important (not controversial). Cleaning equipment should itself be clean – either single use or regularly hot washed and thoroughly dried. The use of microfibre cloths probably has a marginal advantage but, being reusable, comes at a high logistical cost over single use cloths. The routine use of disinfectants probably contributes nothing significant, but they can be useful in terminal cleaning. As different environmental items may be cleaned by different groups of staff (e.g. those who clean floors may not be the same as those who clean patient monitoring equipment), coordination in a terminal clean is vital.
Operating theatres follow the same logic as patient areas: routine disinfection adds nothing; disinfection of contact surfaces after a colonised or infected patient and immediately after spills is important. Formaldehyde fumigation of theatres is hazardous and pointless.
Validation of cleaning by sampling or quantification of markers such as ATP can play a role in education but is unlikely to be of routine benefit. Quality assurance is by equipping, training, motivating and managing those who do this task.

O41 Hand hygiene prevents disease and is done with ease - what is the evidence?

Jacqueline Reilly

Health Protection Scotland and Glasgow Caledonian University, Glasgow, Scotland, United Kingdom

Infection prevention and control practices are a complex synthesis of evidence, very often of an observational nature and theoretical risk, based on biologically reasonable argument. Hand hygiene is very often stated to be the 'single most important method of preventing infections' based on this synthesis of evidence in healthcare settings. The complexity of causes and sources of HAI, the multiple interventions required, and the many confounding variables in studies of infection prevention and control make the evidence base for hand hygiene complex at best.

Hand hygiene compliance is not optimal in healthcare, studies published worldwide point to this. The two components of hand hygiene of: the when and the how, have a limited evidence base. This presentation will overview the evidence for the moment and technique, and address the issues of dogma and evidence in IPC with respect to hand hygiene. In deconstructing the evidence for this infection prevention practice, we can begin to address how we might usefully tackle future strategies to enhance HH compliance, based on the best available evidence.

O42 What's new in: Prevention of catheter associated urinary tract infections

Nizam Damani

Southern Health and Social Care Trust, Portadown, United Kingdom

Urinary tract infections (UTI) are the commonest health-care associated infections (HCAIs), accounting for up to 40% of all HCAIs. Most involve urinary drainage devices, such as bladder catheters. The risk of a catheterised patient acquiring bacteriuria increases with the duration of catheterisation, rising from approximately 5% per day during the first week to almost 100% at 4 weeks. One to four percent of patients with bacteriuria will ultimately develop clinically significant infection, e.g., cystitis, pyelonephritis, and septicaemia.

Various strategies to prevent catheter associated urinary tract infections (CA-UTIs) have been developed including implementation of 'care bundle' developed by the US Institute for Healthcare Improvement and the UK Department of Health.

This presentation will review the current evidence on the successful interventions to reduce CA-UTIs and share my personal experience on the successes and challenges faced on the implementation of CA-UTIs programme on a Trust wide basis both in hospital and community setting.

Reference: epic3: National Evidence-Based Guidelines for Preventing Healthcare-Associated Infections in NHS Hospitals in England. Journal of Hospital Infection 2014; 86 (Supplement 1): S31-S37.

What's new in: Cost effective interventions - use your resources well! O43

Shaheen Mehtar

ICAN and Infection Prevention and Control Unit, Stellenbosch University, Cape Town, South Africa

The effective use of healthcare resources is a global challenge: in high income (HI) countries, it relates to the cost of sophisticated medical technologies used for delivery of healthcare; in low to middle income (LMI) countries it relates to the burden of disease. A cost effective intervention depends upon the utilization of both financial and human resources to maximise improve outcome for health. Such interventions do not have to be expensive. In LMI countries, if good administrative controls are put into place and followed, healthcare associated infections (HAI) can be reduced. In countries where there is a shortage of well trained staff, careful evaluation of the tasks performed can prove cost effective. LMI countries utilise family members to care for in patients - this can be beneficial if they are properly trained and under the guidance of well qualified nursing staff.

Wasteful activities are:

1) the reuse of single use devices which reflects false economy and can lead to a major increase in the burden of HAI,
2) reuse of personal protective equipment (PPE) between patients,
3) the unnecessary use of PPE,
4) an excessive uncontrolled use of disinfectants in the environment. The irrational use of antimicrobial agents not only contributes to increasing the emergence of multiply drug resistant microbes but also increases the risk to patients.

Finally, inadequate cleaning and sterilization, lack of good ventilation and soaking medical devices in disinfectants all contribute to surgery associated infection - here the financial investment in improving the infrastructure rapidly pays dividends.

O44 What's new in: Medical device decontamination

Christina Bradley

Hospital Infection Research Laboratory, Queen Elizabeth Hospital Birmingham, United Kingdom

Over recent years there has been an increased awareness of the importance of decontamination of medical devices. The possible risk of transmission of prion related diseases, such as CJD, vCJD, has been one of the reasons for this and has resulted in a large amount of research on improving cleaning and more sensitive methods for the detection of residual protein. This has also led to improvements in the documentation associated with decontamination and the traceability of medical devices. Decontamination is now becoming more centralised and local processing at point of use is not so widely carried out. Centralisation of decontamination is considered to improve standardisation through the implementation of standard operating procedures and dedicated trained staff that will be focused on producing medical devices that are safe for patient use. European and international standards are now in place for the validation and verification of decontamination equipment such as sterilizers and washer disinfectors so the testing of this type of equipment is much improved. Manufacturers of medical devices are obliged to produce instructions for use, which include decontamination instructions, under the Medical Devices Regulations and EN ISO 17664 (2004) describes the information that should be provided. Purchasers of medical devices should obtain this information prior to purchase.

What's new in: Safer healthcare environment for infection prevention O45

William A. Rutala

University of North Carolina (UNC) Health Care and UNC School of Medicine, Chapel Hill, North Carolina, USA

This presentation will review new research, new technologies and emerging issues in the healthcare environment by covering three topics. These include:

1) reprocessing medical and surgical instruments;
2) surface disinfection of noncritical surfaces and noncritical patient care items; and
3) water-related pathogens and their disease related pathways (e.g., waterwalls/decorative fountains and *Legionella*).

All invasive procedures involve contact by a medical device or surgical instrument with a patient's sterile tissue or mucous membranes. A major risk of all such procedures is the introduction of pathogenic microbes leading to infection. Failure to properly disinfect or sterilize reusable medical equipment carries a risk associated with breach of the host barriers. Multiple studies in many countries have documented a lack of compliance with established guidelines for disinfection and sterilization; however, most infections associated with reprocessing medical or surgical instruments involve high-level disinfection of semicritical items. Since semicritical items carry the greatest risk of infection we also will discuss reprocessing semicritical items such as endoscopes.

Recent studies also strongly suggest that environmental contamination plays an important role in the nosocomial transmission of several pathogens (e.g., MRSA, VRE, *Clostridium difficile*). These pathogens survive for prolonged periods of time in the environment, and infections have been associated

with frequent surface contamination in hospital rooms and of healthcare workers hands. In some cases, the extent of patient-to-patient transmission has been found to be directly proportional to the level of environmental contamination. Improved cleaning/ disinfection of environmental surfaces and new technologies (e.g., UV, hydrogen peroxide) will be discussed. Water walls and decorative water fountains also present an unacceptable risk in hospitals serving immunocompromised patients (even with standard maintenance and sanitizing methods).

Strict adherence to current recommendations for reprocessing semicritical items, and effective surface disinfection are essential to eliminate the environment as a source for transmission of healthcare-associated pathogens.

O46 Achieving frontline ownership of the infection control message

Michael Gardam

University of Toronto, Canada

Many infection control programs struggle with achieving healthcare worker compliance with recommended practices. For example, while the vast majority of healthcare workers likely understand the importance of good hand hygiene practice, for whatever reason, they often struggle with compliance. In our experience one major reason for front-line healthcare workers poor infection control practice (or poor compliance with many other patient safety initiatives as well) is because they are highly disengaged from improvement efforts rather than a lack of understanding or education. Essentially healthcare workers are frequently told what to do and asked to implement improvement strategies that may not make sense to them in their local context. Front Line Ownership (FLO) is an improvement approach which deeply engages those who are „touching the problem" to develop and implement solutions to complex patient safety problems. FLO borrows from two complexity-science approaches, Positive Deviance and Liberating Structures and has been used to address many patient safety issues such as healthcare worker hand hygiene, compliance with isolation precautions, preventing patient falls and others. By using FLO at one Toronto hospital our group has been able to bring about a marked rise in healthcare worker hand hygiene compliance which has been sustained for several years without any additional support from the infection control program beyond providing audit data. This presentation will provide many examples of the successful use of FLO in Canadian and American healthcare settings.

Pro-con debate: Barrier precautions: are they cost-effective in improving patient outcome? O47

Pro: Jennie Mayfield

Barnes-Jewish Hospital, St. Louis, Missouri, USA

Con: Donna Moralejo

Memorial University School of Nursing, St. John's, Canada

The use of barrier precautions as one of the multiple measures to terminate outbreaks has become the norm. But numerous studies have highlighted the impact on the personal, social and emotional well-being of the individual patient.

This pro-con debate will explore the various costs of using barrier precautions, and help assess their cost –effectiveness in improving the patient outcome, both collectively and as individuals.

Antimicrobial stewardship in southern Europe: where are we? O48

Nicola Petrosillo

SIMPIOS - Italian Society for the Prevention of Infections in the Healthcare Settings, Rome, Italy

Appropriate utilization of antimicrobials has become a global concern because of the emergence of multiple drug resistant microorganisms and the lack of novel antimicrobial agents in the pipeline. Thus, to ensure that options exist for treating infections, it is imperative to make the best use of the antimicrobials that are currently available.

Antimicrobial stewardship programs have been pursuing this goal for decades. These programs focus on ensuring the proper use of antimicrobials to provide the best patient outcomes, lessen the risk of adverse effects, promote cost-effectiveness, and reduce or stabilize levels of resistance. Essential to a successful antimicrobial stewardship program is the presence of at least one infectious diseases-trained physician who dedicates a portion of their time to the design, implementation, and function of the program. However, even though all the countries in Southern Europe have skilled infectious diseases specialists and, often, infection control professionals, there are no clear national or coordinated legislative or regulatory mandates designed to optimise use of antimicrobial therapy through antimicrobial stewardship.

This is even more disturbing by the fact that most of the countries in Southern Europe are experiencing a diffuse spread of antimicrobial resistance both in gram negatives and in gram positive organisms, the highest consumption of antimicrobials in Europe and an epidemic diffusion of Clostridium difficile infections, mostly related to the use and overuse of antimicrobials in the hospital settings and long term care facilities.

To prevent a worst microbiological scenario, antimicrobial resistance must be recognized as a significant problem and efforts undertaken to halt its growth, including coordinated programs for optimizing the use of antimicrobials.

O49 MRSA in neonatal intensive care: is it still meaningful to talk about community and healthcare acquired strains?

Caterina Mammina, Daniela Maria Geraci, Laura Saporito, Celestino Bonura, Mario Giuffrè

Department of Sciences for Health Promotion and Mother-Child Care „G. D'Alessandro", University of Palermo, Italy

MRSA still remains a major public health problem. For decades since the first isolation of MRSA in 1961, it has been considered a nosocomial pathogen, but during the '90s reports about community-associated (CA) MRSA among healthy individuals began to appear. They were soon shown to be characterized by a distinct genetic makeup, unrelated to healthcare-associated (HA) MRSA. However, CA-MRSA strains are increasingly implicated in healthcare-acquired infections and HA-MRSA are escaping the hospital towards the community. Moreover, antimicrobial resistance in certain lineages of CA-MRSA is increasing, while some successful HA-MRSA strains, such as EMRSA-15 (ST22-MRSA-IV), are susceptible to most non beta-lactam antibiotics. So, genotypic based definitions have increasingly gained support. However, the radical changes in demographics and organization of healthcare delivery in most developed countries, as well as the increasing knowledge about molecular epidemiology of MRSA, have gradually crumbled the basis of such differentiation. The paradigm of the "revolving door", which vividly illustrates the dynamic of spread between hospital and community of most multidrug resistant organisms, is working as well for MRSA. However, molecular epidemiology confirms that it is working in a bidirectional way, with strains such as ST1-IV or ST8-IV (USA300) invading the healthcare settings and strains such as ST22-IV increasingly reported outside the hospital setting. Cross-transmission into healthcare facilities is amplifying their public health and clinical impact.
The most remarkable features of MRSA epidemiology in Palermo, Italy, will be described with special attention to a widely predominant strain, tst-1 positive ST22-IVa, and its epidemiological pattern in NICU.

O50 Inter-hospital spread of colistin-resistant Acinetobacter baumannii in the intensive care unit: outbreak investigation and management

Antonella Agodi[1], Martina Barchitta[1], Annalisa Quattrocchi[1], Patrizia Bellocchi[2], Anna Mattaliano[2], Alida Imbriani[2], Anna Elisa Marchese[2], Giacomo Castiglione[2], Loredana Giaquinta[3], Maria Antonietta Romeo[3]

[1]Department GF Ingrassia, University of Catania, Italy
[2]University Hospital Agency - University 'Policlinico-Vittorio Emanuele', Catania, Italy
[3]Hospital Agency Cannizzaro, Catania, Italy

From 2006 to 2013, all Acinetobacter baumannii isolates from two intensive care units (ICUs) of two Sicilian hospitals were prospectively collected and epidemiological relatedness and clonality assessed using PFGE and MLST. Patient-based surveillance was conducted using the protocol of the Italian Nosocomial Infections Surveillance in ICUs network (SPIN-UTI project) GISIO – SItI, and previous antibiotic consumption was recorded.

Index cases were identified in 2006 and in 2008 in the two ICUs, respectively. Small outbreaks of carbapenem- and colistin-resistant A. baumannii isolates were identified in different time periods in the two ICUs. PFGE analysis of isolates indicated the inter-hospital dissemination of clonally related isolates, which belonged to a unique PFGE-clone (ST2, International clone II). All involved patients were previously treated with carbapenem and colistin, suggesting potential in vivo selection, given the simultaneous coexistence in the same patient of both colistin-susceptible and resistant clonally-related isolates. Multimodal infection control measures were implemented following the detection of the index A. baumannii isolates in both hospitals. Particularly, in 2010, the Nosocomial Infection Committee of one hospital, implemented specific guidelines related to "Procedures for the isolation of patients colonized or infected with multidrug resistant bacteria in the ICU". Possibly due to the prompt detection of these isolates and strict staff adherence to the reinforced infection control measures, the clusters of resistant isolates were effectively controlled. Judicious use of antibiotics is of greatest importance in order to prevent and to control the epidemic spread of multidrug resistant A. baumannii in the ICU setting.

O51 Surveillance and control of antimicrobial resistance: a regional experience

Carlo Gagliotti

Regional Health and Social Agency of Emilia-Romagna, Bologna, Italy

Emilia-Romagna is a region of 4.4 million inhabitants with a public health system that includes 18 health trusts (HTs). It is located in northern Italy, a country that, according to the international surveillance networks, has one of highest rates of antibiotic consumption and antimicrobial resistance in Europe. To counteract this situation, the Regional Health and Social Agency (ASSR) of Emilia-Romagna has promoted specific infection control projects working in close collaboration with the Department of Health and the HTs. As result of the regional activities, a reducing trend in antibiotic use has been observed starting from 2010, followed by a reduction of antimicrobial resistance rates.

In the last few years, the ASSR has implemented the regional surveillance and reporting system of antibiotic use and antimicrobial resistance and the regional alert for the early notification of outbreaks and sentinel events (e.g. isolation of bacteria with unusual resistance phenotypes). The ASSR also promoted the production of guidelines for management of urinary infection in the general population and otitis and sore throat in children, the surveillance of use of hand hygiene products and the surveillance of surgical site infection. More recently, a further surveillance has been established within a region-wide intervention to control the spread of carbapenemase-producing Enterobacteriaceae (CPE). After the implementation of the specific control measures, the spread of CPE has been effectively countered with a significant reduction of invasive infection caused by these microorganisms. Although the problem of antimicrobial resistance is still relevant in Emilia-Romagna, the control activities have shown encouraging results.

Clean hands do save lives: simplifying the message – achieving behaviour change O52

Claire Kilpatrick, Julie Storr

KSHealthcare Consulting Ltd., London, United Kingdom

Hand hygiene in healthcare is a public health intervention; if performed at the right times it prevents colonization, infection and harm, ultimately saving lives; similar to the action of vaccination. Hand hygiene was recently described as one of ten patient safety

strategies ready for adoption now. Evidence suggests however that we need to account for the complex and dynamic nature of healthcare, considering multiple demands faced by staff, as well as the need for prioritization of tasks to relieve strain and embed and combine hand hygiene actions into natural workflow. Ten years since WHO focused its attention on hand hygiene as a global patient safety challenge, countries, hospitals and infection preventionists are hungry for a new approach as has been discovered through recent focus groups conducted in different countries.

The workshop presents this new approach, to the simple yet complex topic of hand hygiene – it provides a fantastic leap forward in thinking and has been proven to change attitudes. Simplifying messages is key to changing behaviour.

Objectives

1. To describe a human factors approach for this time, aimed at changing hand hygiene practices,
2. To describe focus group experiences of knowledge and attitudes towards hand hygiene in this decade, from different countries,
3. To facilitate use of progressive behaviour change approaches,
4. To outline the power of language within the context of a communication framework for behaviour change,
5. To provide a 'moment' of inspiration and motivation to trigger sustainable action at the point of patient care.

O53 Understanding organisational culture and its influence on infection prevention and control behaviour

Silvio Debono

Maastricht School of Management, The Netherlands

There is nothing more complex that actually trying to understand something which cannot be seen, cannot be rationalised but yet can be felt. Organisational culture is usually defined as a set of norms, values and beliefs which although are not written (as organisational rules, standard operating procedures and policies) they are commonly understood and equally shared. Organisational culture also develops along with people and can take different forms and shapes.

Organisational culture is unique and very often is the result of organisation history, its leadership and people that have worked in it. Culture has also become an essential part of today's corporation fashion world.

Update on MERS-coronovirus infections O54

Sergey Eremin[1], Ana Paula Coutinho Rehse[2]

[1]World Health Organization, Geneva, Switzerland
[2]World Health Organization, Copenhagen, Denmark

Since the Middle East respiratory syndrome coronavirus (MERS-CoV) was first identified in 2012, more than half of all laboratory-confirmed secondary cases of MERS CoV infection have been associated with healthcare settings. The workshop organized by World Health Organization will provide an opportunity to update the IFIC audience on the MERS CoV epidemiology, current recommendations on infection prevention and control, and discuss controversial issues and uncertainties. The workshop will include an interactive session "MERS CoV: how public health risk assessments can foster infection control?"

Achieving change through improved audit and feedback: lessons from the FIT trial using personalised feedback and goal setting to improve hand hygiene O55

Sheldon Stone

University College London, Royal Free Campus, London, United Kingdom

Changing healthcare workers' infection control practice is difficult. Achieving sustained change is especially hard. Much of this difficulty may arise from failure to use the behavioural theory to design and implement intervention to improve practice.

This interactive workshop will draw on our experience of implementing a behavioural intervention in the

successful FIT trial (PLoS ONE 7(10):e4167), which resulted in a sustained absolute increase in hand hygiene compliance of up to 18%. This three year study took place in 60 wards in 16 hospitals and coupled audit and feedback to a repeating cycle of personalised goal setting and individualised action planning. This method is, we believe, applicable to interventions to improve other infection control behaviours.

The workshop will describe the FIT intervention, present the results of the trial and the reasons why it may work, and describe the factors influencing implementation of the intervention. Through interactive scenarios the workshop will demonstrate how to give effective feedback and how to develop individual action plans. The training materials are available on a website (www.idrn.org/nosec.php).

O56 Chlorine dioxide effectively reduce infective Clostridium difficile spores and multi-resistant bacteria (MRB) on inoculated glass surfaces

Torbjorn Noren[1], Eva Forsberg[2]

[1]Department of Infection Control, Örebro University Hospital, Sweden
[2]Laboratory Medicine, Örebro University Hospital, Sweden

A chlorine dioxide (ClO2) disinfectant with a combined surfactant was tested at different concentrations for sporicidal activity on dense (108 cfu) spore solutions of clinical Clostridium difficile strains (UK 023). In absence of European standards a designed carrier test on glass was performed involving 1-10 minutes exposure interrupted by dilution in 250mL of water and filtering for viable counts. Additional standardized swabbing of inoculated surface was cultured for total sporicidal efficacy. Initial testing proved in triplicates a median log10 reduction of 4 and 6 for 800 and 1600 ppm ClO2, respectively. Superior total elimination of viable spores was noted for 1600 ppm ClO2 and hypochlorite 10% vs. oxone (Virkon™1%), hypochlorous acid (Actichlor Plus™) and guanidine (PHMG) supported (Five-Woods™) achieving only a 1-3 mean log10 reduction. Ethanol 70% control showed no reduction in viable counts. Exposure of one minute of ClO2 was sufficient for a maximum sporicidal activity. None-sporulating bacteria of nosocomial importance, i.e. meticillin-resistant Staphyloccus aureus (MRSA) and vancomycin-resistant enterococci (VRE), was effectively eradicated by ClO2 down to a concentration of 200 ppm, fully comparable to ethanol 70%. In conclusion repeated testing indicated that 1600 ppm ClO2 effectively reduces high-concentrated spore-suspensions of C. difficile on glass surface carriers and in addition eliminated MRSA and VRE down to ClO2 concentration as low as 200 ppm. The rapid and effective inactivation makes ClO2 an attractive bacterial sporicidal disinfectant to be used on touch surfaces within hospital environment. In addition, adjunctive effect from mechanical cleaning is still to be evaluated.

O57 Ventricular assist device driveline infections along two different periods of treatment

Miriam Abuhazira

Rabn Medical Centre, Petach Tikva, Israel

Background

The main complication of long-term ventricular assist device (VAD) implantation is infection around the drive line (DLI). To reduce the rate of DLI, and improve the quality of care, a multidisciplinary team was established. The purpose of this work is to examine the incidence of infections in two time periods, before and after the implementation of the unique multidisciplinary work.

Methods

In 2008, we began VAD implantation in our department. Until the end of 2009 VAD patients were treated along the same protocol as other cardiac surgical patients. In order to improve the outcomes and work process, many changes and activities were introduced in the management of these special patients. An outpatient clinic was established. The surgical technique was also modified. The dressing technique of the wound around the drive line was improved. A training program was also established to educate hospital staff, community staff and caregivers.

Results
in 2008-2009, all 5 patients that had been discharged home, had drive line infections (DLI). Two patients also required surgical debridement. In 2010-2012 after implementation of changes, among 22 patients that were discharged home, only 4 patients had a DLI. One patient had a superficial DLI and three had deep DLI. Two of them required pump replacement.

Conclusions
The incidence of infections in patients with VAD can be significantly reduced by using modified care techniques, patient and caregiver education and creation of professional, available support network. There is still a lack of evidence based protocols for infection prevention and treatment in VAD patients.

O58 Assessing ultraviolet light disinfection: microbiological efficacy and integration into hospital workflow

Elizabeth Bryce[1], Titus Wong[1], Tracey Woznow[1], Mike Petrie[1], Amin Kadora[2], Elena Murzello[1]

[1]*Vancouver Coastal Health, Canada*
[2]*Calilano University, Vancouver, Canada*

Introduction
Hospital room cleaning can be suboptimal, therefore the use of ultraviolet light disinfection (UVC) as an adjunct has become an area of interest. There are studies documenting its microbiological efficacy but information on the ability to integrate UVC into hospital workflow as well as the evaluation of the technology from a human factors engineering (HFE) performance is sparse. The VGH team assessed two UVC machines for in-use antimicrobial efficacy, HFE performance, and workflow integration.

Methodology
The Tru-D SmartUVC™ (Lumalier Corp, Memphis, TN) and the R-D Rapid Disinfector System™ (Steriliz, Rochester, NY) were each evaluated over approximately an eight-week period. Microbiological carrier studies as well as patient room microbiological assessments were performed. A HFE analysis assessed each machine for usability. Housekeeper (user) satisfaction surveys were also conducted.

Results
Laboratory carrier studies demonstrated that both UVC machines performed well when strains of methicillin resistant Staphylococcus aureus or vancomycin resistant enterococci were suspended in normal saline. However, when suspended in a protein load, the microbial efficacy of UVC disinfection dropped by approximately two logs. Clinical microbiology studies from six high-touch surfaces in patient rooms confirmed that UVC provided at least an additional log reduction in colony counts. On balance, users preferred the RD technology because of the integrated software program for room tracking, the ability to select only one UVC intensity setting, and the more rapid disinfection time. The RD system was more readily integrated into workflow because of its shorter cycle times.

Conclusion
Whenever new technology is implemented, there must be equal consideration given to efficacy (i.e. how well the technology works) and efficiency (how optimally the technology fits in with workflow practices).

Bundle implementation to reduce coronary artery bypass graft (CABG) surgical site infections (SSI) O59

Connie Patterson, Ramona Rodrigues

McGill University Health Centre, Montreal, Canada

Introduction/objectives
Surveillance of cardiac surgical procedures has been conducted since 2007 at the McGill University Health Centre, a tertiary care centre. Infection rates were relatively high. In 2010, a bundle program was initiated in collaboration with the cardiac, anesthesia and nursing team with the aim of reducing CABG infection rates.

Methods
Clinical and laboratory criteria included: patients' suspected to have a SSI by a clinical nurse specialist, review of patients' charts having a positive wound or blood culture result, antibiotic use, readmission into hospital, emergency room department or wound

care clinic visits. The NHSN definitions were used to identify SSI.

Results

During the year the bundle was initiated (2010) there was a reduced impact on CAGB SSI when compared to the previous years without a bundle. Sustainability for reduced infections using the bundle continued into 2011 only for CABG leg infections but not for CABG sternum infections.

Conclusion

Success was likely due to the close monitoring of the bundle recommendations initially in 2010-2011. There was an interest at the time by anesthesiologist in maintaining normo-glycemia for their study and we had commitment from the surgeons. Once the normo-glycemia study ended there was poor glucose control in 54% of the patients post operatively and intraoperative prophylaxis dropped to 62% compared to 80%. Demonstrating that although the bundle was still in place, sustainability in reducing SSI is closely linked to a better follow-up by implicated team members.

O60 Knowledge, attitudes and practices regarding hand hygiene at a dental school

Jordan Jacobs, Laura Romito, Charles John Palenik, George J. Eckert

Indiana University School of Dentistry, Indianapolis, Indiana, USA

Objective

This study assessed hand hygiene (HH) knowledge and performance at a US dental school.

Methods

A 23-item survey consisting of demographic, knowledge, attitude and behaviour inquiries was offered to 655 individuals. Participation was voluntary. Survey data were coded and statistically analyzed.

Results

439 usable surveys came from clinical staff (43), full-time clinic faculty (29) and dental assisting (DA, 20), dental hygiene (DH1, 39 & DH2, 38), and dental students (D1-D4, 269).). D1 and D2 had no clinical experience. Staff had significantly fewer ($p<0.05$) correct responses concerning proper HH knowledge compared to D2, D3, DH and DH2. DA had significantly fewer ($p<0.05$) correct responses compared to D2, D3, D4, DH1, DH2 and faculty. D1 had significantly fewer ($p<0.05$) correct responses compared to D2, D3, D4 and DH2. D3 had significantly fewer ($p<0.05$) correct responses compared to D2 and DH2. DH1 and faculty had significantly fewer correct responses compared to D2. Only 7% (30/439) answered all five HH knowledge questions correctly. Attitude/assessment responses used a seven-point scale. All groups believed HH is effective in preventing infection (mean = 6.1±0.1). The lowest mean score (3.0±0.1) came from all groups when asked if students regularly received HH feedback. Reasons for non-compliance with proper HH protocols were: forgetting (41%), too busy (27%), product unavailable (22%), product not convenient (20%), unsure of need (12%), skin damage (10%), disliked available product (4%), unpleasant product smell (3%) and other (3%).

Conclusions

Clinical experience seems uncorrelated with HH knowledge. Regular feedback concerning proper HH is needed.

Transposing change management theory into healthcare settings O61

Silvio Debono

Maastricht School of Management, The Netherlands

Charles Handy of often quoted as saying that "Change is the only constant in organisations". Notwithstanding that this is true, it is also certain that humans are species of habit and hence refuse to change their behaviour unless it is mandatory to do so. This makes any change process a mammoth task in most organisations, particularly those that that require higher level of human intervention. Change is also inevitable and today's leaders spend most of their time reacting to externally driven changes, dealing with internally driven conflicts and structuring future goals.

For change to be successful, it needs to be well planned, communicated and set within the organisation's fabric. Leaders need to be aware that change is not a product that can be bought and enjoyed, but is set in the minds of different stakeholders.

O62 Priorities in the prevention and control of multi-drug resistant Enterobacteriaceae

Hilary Humphreys

RCSI and Beaumont Hospital, Dublin, Ireland

Recent years have seen a shift from outbreaks/challenges with Gram-positive bacteria, i.e. MRSA and VRE, to multidrug-resistant aerobic Gram-negative bacilli, i.e. extended-spectrum ß-lactamase (ESBL) and carbapenem-resistant Enterobactericeae (CRE). Enterobacteriaceae that produce one or more ESBLs are now relatively common in the community and in hospitals. The challenges represented by CRE are very difficult as there are so few options for treatment and these bacteria can spread easily. There are multiple families of bacteria and species involved, many different mechanisms, and the involvement of the agri-food sector is outside the control of healthcare practitioners. Where resources allow, all at-risk patients admitted to an acute hospital should be screened for CRE especially to critical care units such as ICUs. Appropriate laboratory methodologies with the back-up of molecular facilities to confirm CRE are necessary. Patients identified as being CRE positive in hospitals should be isolated with the strict application of standard and contact precautions but it is not clear for how long. There are no proven effective measures for the eradication of CRE from the gastrointestinal tract. Aggressive environmental decontamination strategies are important especially if there is significant dissemination such as from a patient with diarrhoea. The threat posed by CRE and ESBLs are very real and challenging. Prevention and control needs to address wider issues within the community such as the use of antibiotics in animal husbandry, as well as what is applicable in the healthcare sector.

What are they learning; when they are learning? O63

Judith Richards

International Federation of Infection Control, Norwich, United Kingdom

The prevention and control of healthcare-associated infection (HCAI) is a significant patient safety and quality issue. In spite of its importance, busy medical and nursing undergraduate curriculums have not allocated it sufficient time and space.

Already in 2006, Mann & Wood aimed to assess the knowledge of third-year medical students at the University of Birmingham Medical School, UK on infection control policy and procedures, and after a semi-structured questionnaire, reported that forty-nine percent of medical students thought that there was insufficient emphasis on infection control in their course.

In a survey presented in 2009, O'Brian and colleagues reported that whilst the prevalence and transmission of HCAI were taught by 97% and 100% of medical schools, respectively, the importance of HCAI as a quality and safety issue was covered in only 60% of medical schools.

Compliance amongst medical students and graduates with basic measures such as hand hygiene is still inferior to that amongst other healthcare groups such as nurses.

Some studies have assessed the knowledge of medical students on HCAI prevention, but few have assessed attitudes and practice or behaviour, and recent problems in the UK have highlighted attitudinal problems amongst nurses, and other health care professionals.

This presentation will aim to identify how the teaching of infection prevention and control is addressed at undergraduate and post graduate level, provide some examples where multi-modal teaching has improved attitudes and understanding, and discuss how these changes can be introduced on a larger scale.

O64 Lesson planning and supportive learning environments: applying concepts of teaching and learning to teaching infection control

Donna Moralejo

Memorial University School of Nursing, St. John's, Canada

Healthcare workers play key roles in the prevention of infection, but they need to know what to do, when to do it, and how to do it. Infection control practitioners (ICPs) are therefore involved on a regular basis with teaching others about infection prevention and control. Teaching however involves more than giving information. To be effective teachers, ICPs need to understand principles of adult education and have tools they can use to plan and implement education sessions.

Lesson planning is one tool that can help ICPs align learning objectives with the needs of learners and the teaching strategies used. This session will focus on:
1) writing useful learning objectives that are linked to an assessment of different learner characteristics, and
2) integrating key principles of adult education with planning the content to be taught, choosing teaching strategies to be used, and promoting supportive learning environments.

Practical examples will be given to illustrate the concepts and their application to teaching infection prevention and control.

O65 Reinforcement from patients, families and colleagues: do disclosure and transparency help the education process?

Candace Friedman

University of Michigan Health System, Ann Arbor, Michigan, USA

Transparency is one important aspect of patient centered care and patient engagement. Providing patients and family members with information assists them in decision-making about their options for care. Publicly reporting quality measures is one feature of this process. Timely and open disclosure of information to everyone - including clinicians and patients and their families - following unanticipated adverse medical events is also part of transparency. When staff, patients and families are part of this process it leads to more informed patient choice, provides feedback to colleagues, helps improve quality and lower the cost of care, and improves oversight by administration. An integral part of disclosure and transparency is education of patients and their families and staff members. This presentation will outline the types of information disclosure in health care and the education needs of staff and patients.

What's new in: Endoscope decontamination O66

Christina Bradley

Hospital Infection Research Laboratory, Queen Elizabeth Hospital Birmingham, United Kingdom

Flexible endoscopes are probably the most challenging medical device from the viewpoint of decontamination due to the complexity of their construction and heat sensitivity. There have been recent reports of possible transmission of infection leading to "patient look back" exercises. These incidents have been due to failures to carry out leak testing and to irrigate all channels, in particular the raiser bridge channel. This has led to an increased awareness of the need for training staff that carry out all stages of the decontamination procedure and the introduction of standard operating procedures. The manual cleaning stage is in two parts - at the patient beside and then in a dedicated decontamination room. Endoscope washer disinfectors are now widely available but users need to be aware of the need for validation of the washers in accordance with EN 15883 (2008) in particular the microbial quality of the final rinse water. A trend now in larger hospitals is for endoscope decontamination to become centralised, very much like a sterile service department, where dedicated trained staff carry out the decontamination procedure to a standardised level. There has also been an increase in the use of drying/storage cabinets which allow for prolonged storage of endoscopes.

O67 What's new in: Clinical waste management

Edward Krisiunas

WNWN International, Burlington, USA

During the past 25 years, healthcare facilities have been introduced and exposed to a number of products and practices related to clinical waste management. The ubiquitous sharps bin or container has evolved into numerous shapes and sizes to accommodate the ever creative sharp devices developed by the medical device industry. Body fluid management has morphed from reusable metal containers into disposable devices made from recycled material that can be macerated and discharged to sewer systems. Larger portable fluid suction apparatus are now employed in theaters to minimize staff exposure to blood and body fluids as well ease disposal of the collected fluids. In some parts of the world reprocessing of single use devices has reduced waste disposal expenditures as well as the cost of the instruments when resold to a healthcare facility. However this remains a contentious issue relative to patient safety and informed consent. Environmental impacts of poorly designed and operated incinerators, the method of choice for many years to dispose of clinical waste has led to the development of a wide range of non-burn or alternative treatment technologies to process clinical waste streams. Many of these advancements have improved employee safety as well as public health. However, gaps remain in the availability of these devices in limited resource settings. This presentation will discuss the advancements made in practices and products used to collect and treat the clinical waste stream, as well as identify gaps and options to fill those gaps.

O68 What's new in: Safety of linens and clothing

Sally Bloomfield

London School of Hygiene and Tropical Medicine; International Scientific Forum on Home Hygiene, London, United Kingdom

Published data on the role of clothing, bedlinens towels etc in the transmission of infection and the spread of antibiotic resistant strains, and the efficacy of machine laundering in reducing infection risks has been recently reviewed. The review considers both normal daily life and healthcare situations. Although there is no intervention study data showing a direct link to infection rates, there is extensive microbiological and epidemiological data demonstrating that clothing, bedlinens etc are risk factors for infection transmission and importantly also, for the spread of multidrug resistant strains. These risks need to be suitably managed as part of a multibarrier approach to hygiene/infection prevention both in hospitals, and out of hospital settings. A total of 29 publications on the effectiveness of laundering in reducing bacterial, fungal and viral levels on contaminated fabrics were identified. An analysis of the data shows the extreme variability in the log reduction values obtained from different studies which makes it extremely difficult to make recommendations on laundering for consumers and healthcare workers with any degree of confidence based on current data. The implications are discussed in relation to both the hygiene efficacy and sustainability of home and institutional laundering.

What's new in: Prevention of healthcare associated pneumonia O69

Egil Lingaas

Oslo University Hospital, Norway

From 2010 up to February 2014, at least 464 papers were published in medical or nursing journals on prevention of healthcare associated pneumonia (HCAP), hospital acquired pneumonia (HAP) or ventilator associated pneumonia (VAP). This indicates that there are still many unresolved issues associated with these conditons. There are several challenges when assessing the impact of preventative measures againt these infections. First, the optimal means of diagnosis is still a controversial aspects of this condition, and a new surveillance definition is currently beeing evaluated. Second, the effetcs may vary between patient subgroups, and will be influenced by the outcome indicators chosen, i.e. morbidity, mortality, ventilator days, duration of ICU or hospital stay etc., as well as

the prevalence of multidrug resistant organisms of the hospital and country. Many preventative measures are currently under scrutiny, like antibiotic prophylaxis, oral and digestive decontamination, chlorhexidine whole body washing, the use of continuous subglottic or oral suctioning, elevation of the head of the bed, education, the bundle approach and others.

O70 Human factors in infection control behaviour

Julie Storr[1], Claire Kilpatrick[1], Neil Wigglesworth[2]

[1]KS Healthcare Consulting, London, United Kingdom
[2]Public Health Wales, Cardiff, United Kingdom

The application of human factors principles within infection prevention and control activities have been up until now largely unexploited. Human factors approaches per se have been addressed in a piecemeal manner within infection prevention and control, with some interesting examples, mainly centred on checklists. However, this has tended to take place in a vacuum and has not been as transparent as it might have been in order to inspire others to consider such an approach.

This presentation proposes that the time has come to strengthen infection prevention and control capacity and capability by embedding human factors principles, methods, expertise and tools. To address how we can better develop interventions that work safely today within the complex sociotechnical system that is healthcare, a root and branch review of infection prevention measures through a human factors lens is suggested as a way forward. This is essential if the requisite behaviour change is to be achieved in healthcare at this critical juncture, if the gains of recent years are to be maintained and if the defects in processes and adherence to protocols are to be successfully overcome.
In order to progress the integration of human factors into infection prevention and control it is crucial that policy makers, national organisations with a remit for quality and patient safety, professional infection prevention and control bodies, academics, as well as leaders within healthcare organisations, explore and facilitate a number of actions now, which will be outlined.

O71 Evidence based infection control in intensive care

Petra Gastmeier

Institute of Hygiene and Environmental Medicine, Charité-University Medicine Berlin, Germany

According to the data of the European point prevalence study 2011/12 every 4th patient in an intensive care unit has a healthcare acquired infection. Therefore better infection control measures in ICUs have a high priority. However, there is a growing importance for critical assessment of benefits and harms of various infection control strategies in intensive care units. In addition, ongoing financial constraints, changing demographics with an increasing and aging population and the slow introduction of new antibiotics make the utilization of the best available evidence essential in the ICU setting.

The review will summarize findings from some of the recent major publications in the area of infection prevention with emphasis on the role of the skin, oral and intestinal microbiom in causing endogenous healthcare acquired infections in ICU patients and decolonization measures to decrease infection rates. Furthermore, the audience will be updated on some recent findings to prevent nosocomial infections due to spread of microorganism from one patient to the other.

Poster Presentations

P1 New methods to assess impact of work overload on healthcare infections risk

Michal Abrahamowicz, Christian Rochefort

McGill University, Montreal, Canada

Background

Infections in healthcare institutions often result from a suboptimal performance of healthcare personnel. The risk of such mistakes or omissions is, in turn, likely affected by such organizational factors as the mean number of patients per staff member in a given ward, and/or their recent overtime works. However, attempts to formally demonstrate a link between work overload and risk of infections in healthcare institutions are complicated by important analytical challenges. Firstly, workload varies from shift to shift. Secondly, whereas infections likely occur only after a certain time lag or latency, relative to the timing of the contributing errors or omissions in the care received by the patient, the length of such latencies is unknown. Finally, current risk likely depends on the cumulative effect of staff work overload, across several previous shifts.

Objectives

To propose a comprehensive analytical framework to address the above analytical challenges and, assess the impact of previous work overload on the risk of healthcare infections.

Methods

We rely on recent advances in modeling of event time data and combine:

1) time-varying covariates representing changes across shifts in 'exposure' (e.g. mean number of overtime hours per healthcare worker); with
2) flexible modeling of the cumulative impact of 'past exposures', which assigns relative importance weight to different past shifts, which both account for the time lag, and estimate its length.

Results

The validity and usefulness of the proposed methods will be illustrated using both simulated and real-life data on healthcare infections.

P2 The education of perception on hand hygiene among healthcare workers for patient safety

Selma Altindis, Gülsüme Kaya, Mustafa Altindis, Oguz Karabay

Sakarya University, Turkey

Background

Infection associated with healthcare has been targeted by the World Alliance for Patient Safety during its first biennial Global Patient Safety Challenge, 'Clean Care is Safer Care'. Increased adherence to hand hygiene is widely acknowledged as the most important way of reducing infections in healthcare facilities.

Despite evidence of benefit, adherence to hand hygiene among healthcare professionals remains low. The most effective approach suggested to promote hand hygiene uses multidimensional strategies. The purpose of this study was to examine the influence of education of perception on hand hygiene among healthcare workers in infection control practices.

Material and method

The study was performed in two different periods. The period before training in year 2012 – pre-training

(PreT) and training period in year 2013 - training period (TP) were analyzed comparatively. As of January 2013, the infection control training was regularly given to healthcare employees. In this study, during working hours, hand washing habits of doctors, nurses and allied health staff was observed in certain periods. And the impact of education on hand hygiene was evaluated. Hand hygiene observation data from PreT period (January-April-July-October of 2012) was compared with the data from TP (January-April-July and October of 2013).

Results

The frequency of participation in education was 70% in general. However frequency of participation based on profession was; in doctors 39%, in nurses and allied health staffs 87% and 75% respectively. Hand hygiene compliance in general during PreT period was 43.2% and it increased up to 52.56% in TP. When hand hygiene compliance data from PreT and TP were simultaneously evaluated, it has increased in all the groups.

Conclusion

In our study, hand hygiene habits in healthcare personnel and the effectiveness of training and education on it were evaluated during the period of observation. Increase in hand hygiene compliance has been detected. Therefore, regular in-service training programs and the continuation of this training with full participation of hospital staff will improve hand hygiene habits in a positive direction.

P3 Reduction of HAI *Legionella pneumophilia* pneumonia and *Pseudomonas aeruginosa* sepsis by control of water supply

Leif Percival Andersen, Anne-Marie Blok Hellesøe, Marlene Høg, Bodil Rubenhagen

Department of Infection Control, University Hospital (Rigshospitalet), Copenhagen, Denmark

Introduction

Water associated hospital acquired infections with *Legionella pneumophila* and *Pseudomonas aeruginosa* is a problem in many hospital settings. At Rigshospitalet there was a high incidence of HAI *L. pneumophilia* pneumonia compared to other Danish hospitals. In addition, several dialysis patients with *P. aeruginosa* septicemia could only be explained by infection through the dialysis catheter during showers.

Aim

Is it possible to reduce the number of water associated HAI by systematical control of water supply and focused infection control precautions in wards at risk?

Material and methods

Total germ count and *Legionella* count was measured in shower water and drinking water twice a year. Laboratory and standardized in vivo tests were done on shower water. Incidence rates of HAI *L. pneumophilia* pneumonia, *P. aeruginosa*, *Acinetobacter baumannii* and *Stenotrophomonas maltophilia* septicemia in hospitalized patients were recorded.

Results

Both the incidence rates of HAI *L. pneumophilia* pneumonia, *P. aeruginosa* septicemia in hospitalized patients were reduced more than 50% within few years.

Conclusion

Systematical control of water supply and focused infection control precautions in wards at risk can reduce the number of water associated HAI over time.

P4 Epidemiological characteristics of healthcare associated infections at University Hospital Farhat Hached of Sousse, Tunisia: from analysis to action

Asma Ben Cheikh, Mohamed Mahjoub, Nébiha Bouafia, Waadia Bannour, Radhia Héllali, Mansour Njah

University Hospital Farhat Hached, Sousse, Tunisia

Introduction/aims

Healthcare associated infections (HAI) represents a major public health problem. The objective of our study was to determine the epidemiological profile of HAI at University Hospital Farhat Hached of Sousse (Tunisia) in order to redirect preventive measures.

Methods

A transversal descriptive study was carried out in 2012, using a questionnaire filled beside all hospitalized patients, since at least 48h, in the 16 clinical services. We have adopted 2007 HAI's definitions from National Technical Committee for Nosocomial and Healthcare-Associated Infections (CTINILS-France-2007). HAI risk factors were analyzed by step by step descendant logistic regression with a signification degree $p<0.05$.

Results

The HAI overall prevalence's rate was 14.4%. Infections on venous catheters devices (VCD) were the most frequent (42.2%), followed by respiratory infections (15.6 %).

Retained HAI risk factors after multivaried analysis are neutropenia ($p<10^{-4}$), VCD ($p=0.014$) and stomach tube ($p=0.018$).

Conclusion

It emerges from our study that HAI are more frequent amongst frail patients who are exposed to invasive healthcare procedures; which thus, impose redirection of prevention actions in our hospital by targeting especially the infections on VCD.

P5 Prevalence of meticillin-resistant *Staphylococcus aureus* colonisation amongst residents in Maltese nursing homes

Ryan Borg, Michael A. Borg, Christine Gatt

Department of Pathology, Mater Dei Hospital, Msida, Malta

Introduction

Since the 1960's, meticillin-resistant *Staphylococcus aureus* (MRSA) has become a major pathogen with ever-increasing incidence rates of hospital-acquired and community-acquired infections. Malta has currently one of the highest rates of hospital-acquired and community-acquired infections in Europe. In addition, reports have estimated community carriage at more than 8%. MRSA carriage in homes for the elderly is very important because these residents are often hospitalized and therefore serve as a source of transmission.

Aim

The aim of this study was to establish the prevalence of MRSA carriage amongst residents in governmental nursing homes in Malta.

Methods

Nasal swabs were taken from 397 randomly chosen residents in 10 governmental nursing homes. A short questionnaire including possible risk factors reported to be associated with MRSA nasal carriage was also filled.

Results

MRSA carriage amongst nursing home residents was 19.4% (95% CI, 17.6 – 21.2%) ranging from 0% to 25% amongst the nursing homes studied. Logistic regression analyses indicated that previous hospital admission was the only risk factor that was found to be significantly (OR: 1.956, p: 0.011) associated with MRSA nasal colonization amongst nursing home residents.

Conclusion

A high carriage rate of MRSA was identified in Maltese nursing care residents which can contribute to maintaining MRSA incidence in hospitals. Possible interventions include screening of these patients when they are admitted to an acute care facility and possible decolonization attempts in the nursing homes.

Device-associated infection and mortality in a Tunisian intensive care unit P6

Nébiha Bouafia, Asma Ben Cheikh, Chouchéne Imed, Mohamed Mahjoub, Olfa Ezzi, Slaheddine Bouchoucha, Mansour Njah

University Hospital Farhat Hached, Sousse, Tunisia

Introduction / Aims

Intensive care unit acquired infections (ICU-AIs) constitute an important worldwide health problem. Our aim was to determine the incidence and attributable mortality due to device associated infection (DAI) in ICU patients in Tunisia.

Intervention

We conducted a prospective observational cohort study over a 6 month period in the medical intensive care unit of Farhat Hached University Hospital (Sousse-Tunisia). Patients admitted to the unit were included in the study if they stayed in the ICU for more than 48 hours.

Results

During the study period 105 patients were surveyed; 16 of them (15.2%) developed 17 episodes of DAI (16.6 DAI/1000 days of hospitalization). The most frequently identified infections were central and peripheral venous catheter-associated infection (respectively 21.4% and 10.2%). At ICU discharge, overall mortality was 40%. Independent risk factors for acquiring infection in ICU were the use of central venous catheter (p=0.014) and length stay, those of mortality in ICU were SAPS II of more than 32.5 points (p=0.003), DAI (p=0.002), central venous catheter (p<10-4) and mechanical ventilation (p=0.04).

Conclusions

Even if DAI rates in Tunisian ICU were lower than those published in some reports from other North African countries, DAI data, dominated by catheter associated infections show the need for more-effective infection control interventions in our hospital.

P7 Special weapons and tactics (SWAT) to combat nosocomial *Clostridium difficile* (CDI) infections

Natalie Bruce, Virginia Roth, Karen Stockton, Kathryn Suh, Susan Batista

The Ottawa Hospital, Canada

Background

In September 2012, the Ottawa Hospital (TOH) experienced a rise in nosocomial CDI rates. Despite several initiatives, the rates continued to remain elevated. In January 2013 a multidisciplinary team was created. This was made up of housekeeping, infection prevention and control, physicians, logistical services and nursing, to respond within 48 hours to the immediate issues on a unit where the CDI case occurred.

Objective

The objective of the SWAT team was to initiate a rapid response to any of the infection control related issues, and have heightened awareness of the prevention of CDI.

Materials and Methods

The microbiology laboratory notified the infection prevention and control department (IPAC) of all new *C. difficile* cases. In turn, IPAC would notify the unit manager and the SWAT team lead of any new nosocomial case. The SWAT team was deployed to the unit within 48 hours of notification. With a standardized checklist, the SWAT team walked the unit, reviewing the CDI case, and current practices, and identifying opportunities to prevent further transmission. Together, the team established the 3 top priorities to prevent further transmission. An action plan was created on the first visit, with the goal to address all issues within two weeks of the date of the SWAT.

Results

50 SWAT visits were completed between January 25th, and July 23rd, 2013 on 32 units. The priorities identified among all SWAT visits were hand hygiene, timely isolation, and clutter impeding environmental cleaning. These 3 issues made up 66% of all issues identified. Participants in the SWAT were interviewed. They felt the SWATs provided a forum to discuss issues related to *C. difficile*, and created a heightened awareness about *C. difficile*. CDI rates at TOH have continued to decline since initiating the SWATs.

Conclusions

SWATs are effective in increasing awareness, and swiftly addressing issues related to *C. difficile* at the unit level. The priorities identified in a SWAT provide direction for interventions to prevent further *C. difficile* transmission.

P8 HIV transmission from remunerated blood donor (RBD) to recipients in Georgia, 2012

Irma Burjanadze[1,2], Khatuna Zakhashvili[1], Sophio Dolbadze[1,2], Nicholas J. Heyer[3], Paata Imnadze[1]

[1]National Center for Disease Control and Public Health (NCDC), Tbilisi, Georgia
[2]South Caucasus and Laboratory Training Program SC/ FELTP, Tbilisi, Georgia
[3]Battelle Seattle Research Center, USA

Aim

The number of RBDs was 7 times higher compared to voluntary donors in Georgia in 2012, we investigate a case of RBD to recipients HIV transmission during a possible transmission "window period" (WP).

Method

The RBD was confirmed to be HIV+ by testing his 13th donation using the immunoblot method at NCDC. His 12th donation, two months earlier, had tested HIV- by the blood bank, and these recipients were tracked by tracing back method, investigated by PCR and interviewed usingstandard questionnaires.

Results

Two patients received post surgery transfusions using components of this blood. Both tested HIV+ and were HIV- before surgery. Recipients from the 11th donation were a new-born with congenital abnormalities who died the same day, and another who tested HIV-.

Conclusion

Only the 12th donation RBD was within the WP, and resulted in HIV transmission. Based on this study, the 2013 Blood Safety National Program planned to decrease funding for RDB and increase voluntary donations.

P9 A controlled multicentre intervention trial: comparison of strategies to reduce meticillin resistant *Staphylococcus aureus* rates in surgical patients

Biljana Carevic[1], Andie S. Lee[2], Ben S. Cooper[3], Surbhi Malhotra-Kumar[4], Annie Chalfine[5], George L. Daikos[6], Carolina Fankhauser[2], Sebastian Lemmen[7], Jose Antonio Martinez[8], Cristina Masuet-Aumatell[9], Angelo Pan[10], Gabby Phillips[11], Bina Rubinovitch[12], Herman Goossens[4], Christian Brun-Buisson[13], Stephan Harbarth[2]

[1]Clinical Centre of Serbia, Belgrade, Serbia
[2]University of Geneva Hospitals and Faculty of Medicine, Geneva, Switzerland
[3]Centre for Clinical Vaccinology and Tropical Medicine, Nuffield Department of Clinical Medicine, University of Oxford, United Kingdom
[4]Department of Medical Microbiology, Vaccine and Infectious Disease Institute, University of Antwerp, Wilrijk, Belgium
[5]Infection Control Unit, Groupe Hospitelier Paris Saint-Joseph, Paris, France
[6]First Department of Propaedeutic Medicine, Laiko General Hospital, Athens, Greece
[7]Department of Infection Control and Infectious Diseases, University Hospital, Aachen, Germany
[8]Hospital Clinic of Barcalona, Spain
[9]Hospital de Llobregat, Barcelona, Spain
[10]Istituti Ospitalieri di Cremona, Italy
[11]Ninewells Hospital, Dundee, United Kingdom
[12]Beilinson Hospital, Petah-Tikva, Israel
[13]Henri Mondor Hospital, Paris, France

Prospective, controlled, interventional cohort study, with 6-month baseline, 12-month intervention, and 6-month washout phases was performed. The effect of two strategies has been compared: enhanced hand hygiene promotion and universal MRSA screening with contact precautions and decolonisation (intranasal mupirocin and chlorhexidine bathing) of MRSA carriers. Four hospitals were assigned to each intervention and two hospitals combined both strategies, using targeted MRSA screening. Patients admitted to 33 surgical wards in ten hospitals in nine countries in Europe and Israel, hospitalized for more than 24 hours, were included. After adjusting for clustering and potential confounders, neither strategy when used alone was associated with significant changes in MRSA rates. Combination of both strategies was associated with a reduction in the rate of MRSA clinical cultures of 12% per month (aIRR 0.88, 95% CI 0.79 to 0.98). In clean surgery wards, strategy 2 (MRSA screening, contact precautions and decolonisation) was associated with decreasing rates of MRSA clinical

cultures (15% monthly decrease, aIRR 0.85, 95% CI 0.74 to 0.97) and MRSA infections (17% monthly decrease, aIRR 0.83, 95% CI 0.69 to 0.99).

P10 A novel method of personal cooling in an operating theatre environment

Aaron R. Casha[1], Alexander Manche[1], Liberato Camilleri[2], Marilyn Gauci[1], Michael A. Borg[1], Joseph N. Grima[2]

[1]Mater Dei Hospital, Msida, Malta
[2]University of Malta, Msida, Malta

An optimized theatre environment including personal temperature regulation can help maintain concentration, extend work times and may improve surgical outcomes. However devices, such as cooling vests, are bulky and may impair the surgeon's mobility. We described the use of a low cost, low energy "bladeless fan" as a personal cooling device. The safety profile of this device was investigated by testing air quality using of 0.5 micron and 5 micron particle-counts as well as airborne bacterial counts on an operating table simulating a wound in a thoracic operation in a busy theatre environment. Particle and bacterial counts were obtained with both an empty and full theatre, with and without the "bladeless fan". The use of the "bladeless fan" within the operating theatre during the simulated operation lead to a minor, not statistically significant, lowering of both the particle and bacterial counts. Two way ANOVA testing showed that the staff count in theatre was an almost significant predictor of bacterial counts at p=0.06 and large particle counts p=0.09, but that other predictors were not significant, in particular the fan was the least significant predictor especially with regards to bacterial count and large particle counts. The R-squared-value (0.891) was close to one, indicating that the model provided a good fit. In conclusion, the "bladeless fan" is a safe, low cost and low energy consumption solution for personnel cooling in a theatre environment that maintains the clean room conditions of the operating theatre. Clean room conditions of ISO Class 7/8 were maintained throughout.

P11 Risk factors for acquiring nosocomial methicillin-resistant *Staphylococcus aureus* caused infections in surgical patients

Una Caune, Olga Ņikitina, Aija Zilevica, Kristine Kigure

Riga Medical College of the University of Latvia
Riga East University Hospital, Latvia

Aim/objective

To determine the risk factors for multiresistant nosocomial infections in surgical patients.

Methods

The study was carried out in the Riga East University hospital. 50 patients with infection caused by methicillin-resistant Staphylococcus aureus (MRSA) were included in the study and cases were analyzed. For retrospective study special questionnaire was elaborated and used.

Results

Retrospective analysis of 50 cases with MRSA infection demonstrated the following: 48 patients (47%) had previously diagnosed pyogenic skin processes, 16 (32%) patients have had a recent prior hospitalization, 11 (22%) were patients with diabetes, one (2%) patient before hospitalization remained in closed collective, 1 (2%) resided in long-term care facility. The most significant risk factor occurred to be previous receiving of antibacterial therapy, that was registered in all 50 patients (100%). From another prehospitalization factors diabetes should be mentioned as well as pyogenic skin processes. During hospitalization main risk factor was catheterization. 18 (36%) patients had central venous catheters, 29 (58%) patients peripheral venous catheters, 21 (42%) patients bladder catheters.

Conclusions

The highest risk of becoming infected with MRSA is previous hospitalization and antibacterial therapy, pyogenic skin damages as well as catheterization during hospitalization.

P12 Employees hands hygiene compliance with formal regulations

Dale Cechanaviciene, Birute Sakaliene, Ilza Taleikiene

Kaunas Clinical Hospital, Lithuania

During year 2012, department of infection control implemented employees hands hygiene survey, according to the prepared questionnaire. The data obtained had been unsatisfactory, thus the lectures concerning hands hygiene had been held in hospital departments and constant monitoring had been carried out. The hands hygiene survey has been repeated.

Survey objective: to check whether the results have changed after trainings on hand hygiene.

Survey implementation: the questionnaire, providing to check employees nail conditions, wearing jewellery and usage of hand antiseptic before having contact with patient/performing procedure in the work place, have been created. Employees of infection control department have visited other departments in the hospital and filled questionnaire survey data.

Survey results

In 2012, 156 employees had been examined. Doctors constituted 45% and nurses 55% of all examined employees. It had been found that only 63 employees, that constituted 40.4% of all examined employees, had been working with neat hands, adequate to hygiene requirements. 93 employees hands hadn't been adequate to hygiene requirements and that constituted 59.6% of employees. In 2013 the survey has been repeated. 151 employees have been examined. Doctors constituted 43% and nurses 57% of all examined employees. During survey it have been found that with neat hands, adequate to hygiene requirements (without rings, bracelets, with short nails without nail polish) are working 103 employees, that constitutes 68% of all examined employees. 48 employees hands or 32% haven't met mandatory requirements for hand hygiene.

	Doctors		Nurses		Total	
Nails/Year	**2012**	**2013**	**2012**	**2013**	**2012**	**2013**
Neat	60%	62%	80%	98%	71%	84%
Nail polished	23%	31%	8,50%	2%	15%	14%
Long	16%	7%	9,50%	0%	12%	2%

Conclusion

1. General condition of the hospital hand hygiene is improving;
2. The nurses have more responsible attitude to hands hygiene then doctors. Nurses willingly participated in the training courses on hand hygiene and have more theoretical knowledge;
3. Doctors do not perform hand antisepsis before examining patients, do not know that wearing rings and nail polishing even though with protective polish (nail strengthener) is intolerable;
4. Doctors theoretical knowledge about hand hygiene is insufficient, but they are not concerned with this problem and do not want meetings concerning hands hygiene to be held in their departments.

Mission impossible: changing the way cleaning is done in a healthcare P13

Barley Chironda, Jeff Pows

Toronto East General Hospital, Canada

Introduction/aims:

Healthcare cleaning is challenging. Environmental service workers (EVS) are asked to clean more patient rooms than ever before. Patients are now much sicker, harbour organisms that are difficult to clean like *Clostridium difficile*, and have shorter hospital stays than ever, resulting in increased post discharge room cleaning. Healthcare budgetary constraints result in lower cleaning staffing levels; which has led to EVS feeling rushed, pressured, and often unappreciated causing a lot of stress and anxiety. Sadly, EVS are rarely acknowledged as important stakeholders in the healthcare provision, and yet they are a vital partner in the infection prevention efforts of healthcare.

Interventions

Over two years we have employed change methodology to a large community hospital as well as setting up a process improvement working group (PIWG), increased audit, feedback, involving EVS and IPAC to explore improved simple cleaning processes.

Results

This has revolutionized the way cleaning is done in our hospital. Through this process improvement, we recognized the important role EVS plays; which in turn created a cultural shift in our organization. We believe our approach was innovative. As well we have seen an increase in 70% room audits for *C. difficile* patients on discharge. As well we have seen an increase in brand awareness for the EVS team.

Conclusions

The goal of the 2014 conference aligns perfectly with what we accomplished. Our presentation will highlight our process improvement journey. It will show results and metrics of our accomplishments and how organizational culture transformed. We believe as a result that these achievements can be replicated in other organizations worldwide. We are confident that our lessons will be very much appreciated by the conference attendees.

P14 Drinking water *Legionella* management experience in a hospital building

Juan Cobos López

Guadalajara University Hospital, Alcala University, Guadalajara, Spain

Background

Drinking water *Legionella* management was analyzed from January 2011 to March 2013 at the 30-years-old University Hospital of Guadalajara, Spain. The hospital has 2500 outlets (taps/showers), 365 beds and 18000 admitted patients per year. No cooling towers are installed in this hospital.

Materials, methods and actions:

1) Prevention programme (including: preventive plan, sampling criteria and personal protection equipment);
2) 5-minute daily pipe flushing, in 36 scarcely-used or *Legionella*-contaminated outlets;
3) 16 Pall-Aquasafe water point-of-use anti-*Legionella* filters with proven efficacy fitted in a high risk wards (oncohaematology, neonatology, pneumonology);
4) 5 heaters installed;
5) Monthly thermal shock treatments (70ºC for 5 minutes);
6) Annual hyperchlorinations;
7) Regular temperature and free-chlorine measurements;
8) Hospital-acquired infection epidemiology;
9) Pipework removal;
10) Microbiological results;
11) 2 specifically trained staff.

Once microbiological results were available immediate corrective action was taken. A Legionnaires´ disease surveillance team meeting is then called to analyze the situation and define other corrective actions.

Results

Legionella-positive water samples: 57.6% (102/177).
Annual distribution: 2011: 35% (28/80); 2012: 77.7% (70/90) January 2013: 57.1% (4/7).
Team meetings: 18; 4 (2011), 7 (2012) and 4 (up to March 2013).
Inspections: 3; 2 (2011) and 1 (2012).
Hospital-acquired *Legionella* infections: 1 confirmed (November 2012) and another 1 suspected (January 2013).

Conclusions

Hyperchlorinations were not effective. Deficiencies observed in water temperature control. The rest of measures used partially solved the endemic problem. Pall water point-of-use anti-*Legionella* filters proved to be effective and safe. Hot water heaters: effective and safe as long as they are properly maintained.

Ten year intensive care unit surveillance in Serbia P15

Gorana Cosic[1], Jelena Đekić[1], Nada Ikonić[2], Marijua Živanović[1], Anita Jovetić[1]

[1]Institute of Public Health of Vojvodina, Novi Sad, Serbia
[2]Clinical Centre of Vojvodina, Novi Sad, Serbia

Surveillance was performed in the mixed medical-surgical ICU of the university affiliated hospital as a prospective cohort study. Demographic data of patients hospitalized at least 48 hours in the ICU, data on applied invasive procedures, clinical data and data on associated infections were collected. CDC definitions were used. In a 10 year period over 4500 patients were included in the survey. The average age was 55 years and the average length of stay in ICU was 8 days. Patients with HAI stayed in a hospital for 14 days longer than patients without HAI. The mean incidence rate was 31 on 100 discharges. Annual rate had decreasing trend with the highest incidence density in 2005 (41.5/1000 patient-days) and the lowest in 2009 (17.1/1000 patient-days). The most common type of infection was pneumonia, followed by urinary tract infection, infection of lower respiratory tract and bloodstream infection. The highest incidence rates were in critically ill patients, ASA score 4 and 5, with 31.2% and 42.8% respectively. Pneumonia among patients with mechanical ventilation was more common. The incidence rate of ventilator-associated pneumonia (VAP) ranged from 33.8/1000 days on ventilation in 2005 to 12.2/1000 days on ventilation in 2010. The incidence rate of patients with bloodstream infection decreased as well by the period, from 7.6% to 4.2%. Decreasing rates are mostly due to organised surveillance, continuing education of the stuff and improvements in performing invasive procedures and preventing infection transmission. Sound infection control programmes allows better prioritization of resources to improving medical care.

P16

Self-reported practices, knowledge and attitudes regarding hand hygiene among healthcare workers at a teaching hospital in central India

Vishal Diwan[1,2], Charlotte Gustafsson[2], Senia Rosales-Klintz[2], Sudhir Chandra Joshi[3], Rita Joshi[4], Harshada Shah[4], Ahish Pathak[5,2,6], Megha Sharma[7], Cecilia Stalsby Lundborg[2]

[1]Department of Public Health & Environment, R.D. Gardi Medical College, Ujjain, India
[2]Department of Public Health Sciences (Global Health/IHCAR), Karolinska Insititute, Stockholm, Sweden
[3]Department of Community Medicine, R.D. Gardi Medical College, Ujjain, India
[4]Department of Microbiology, R.D. Gardi Medical College, Ujjain, India
[5]Department of Paediatrics, R.D. Gardi Medical College, Ujjain, India
[6]Department of Women and Children's Health (IMCH), Uppsala University, Finland
[7]Department of Pharmacology, R.D. Gardi Medical College, Ujjain, India

Aim

To explore self-reported practices and to assess knowledge and attitudes regarding hand hygiene among healthcare workers at an Indian teaching hospital.

Setting

The study was conducted at a medical college, its affiliated nursing college and associated teaching hospital in the district of Ujjain, Central India.

Method

This cross-sectional study was carried out in 2010-2011. The study population consisted of physicians, staff nurses, lecturers, clinical instructors and nursing students. Self-administered questionnaires based on the World Health Organization Guidelines on hand hygiene in healthcare were used. The user-centred approach 'My five moments for hand hygiene' provided a framework for investigating 16 situations when hand hygiene is recommended according to the WHO guidelines.

Results

A total of 259 healthcare workers participated (response rate=53%). The proportion of those that reported to 'always' practice hand hygiene in the selected situations varied from 40-96%. Reported barriers to maintaining good hand hygiene were mainly related to high workload, scarcity of resources, perceived lack of scientific evidence and the perception that priority is not given to it, either on an individual or institutional level. Previous training on the topic had a statistical significant association with self-reported practice (p=0.001). Most respondents (90%) were willing to attend training in the near future.

Conclusion

Self-reported adherence and knowledge varied in between situations but practice might have potential of improvement by eliminating identified constraints. Future training needs to focus on enhancing healthcare workers' knowledge on the importance of persistent practice in all situations.

P17 Epidemiology and risk factors of hospital acquired infection in a Tunisian hospital: results of a case-control study

Olfa Ezzi, Nébiha Bouafia, Mohamed Mahjoub, Asma Ben Cheikh, Wadiaa Bannour, Radhia Héllali, Mansour Njah

University Hospital Farhat Hached, Sousse, Tunisia

Introduction / aims

Hospital acquired infection (HAI) continues to be a major public health concern, particularly, in developing countries. Our objective is to estimate the incidence of HAI in the Teaching Hospital F. Hached, Sousse, Tunisia as well as to identify its predisposing factors.

Methods

A case control study was conducted including all patients who were hospitalized since 48 hours in 16 clinical units. Controls were matched by the service and the duration of hospitalization preceding the appearance of HAI in the matched case. Risk factors were collected and analyzed by conditional stepwise logistic regression.

Results

Overall, 73 HAI were identified during the study period among 1428 hospitalizations (incidence rate: 5.1%). In the case control study, 219 controls were matched to cases, totalizing 292 patients. Multivariate conditional stepwise logistic regression analysis showed that only evening or night admission (OR=5.23 [2.39 – 11.43]), longer surgical operation (OR=3.05 [1.04 – 8.91]) and exposure to peripheral intravascular catheter and to mechanical ventilation (respectively OR=2.88 [1.11 – 8.21], OR=1.68 [1.03 – 2.34]) were considered as risk factors of HAI.

Conclusion

Heavy invasive care in particular circumstances of hospitalization are risk factors which are potentially preventable. These factors should be taken into account to improve the prevention and management of health care associated risks in hospital.

P18 Applying WHO hand hygiene strategy into practice: is 100% achievable?

Zvetlana Farrugia, Noel Abela, Michael A. Borg

Mater Dei Hospital, Msida, Malta

Introduction

At Mater Dei Hospital, Malta, an official evidence based hand hygiene campaign 'STOP, RUB and GO' was launched in 2010. A campaign inspired by the WHO multimodal strategy for improving hand hygiene,[1] a campaign based on the work of Pittet *et al.*[2]
Methods:
The hand hygiene (HH) improvement strategy focuses on five objectives that are: reminders at the work place; monitoring hand hygiene and feedback; staff training; system change and improving institutional safety climate. In order to monitor the effect of the HH campaign and subsequent hygiene improvements, audits are carried out continuously. Following HH audits, feedback is given during observation and every three months to nursing and medical stakeholders. All auditing is undertaken centrally by a scientific officer specifically recruited to undertake audit related duties. The WHO HH methodology and audit sheet is used to collect data.[3]

Results

Overall HH compliance improved from 35% to 60% within 1 year and remained approximately stable since then. HH before patient contact is significantly less then after contact. Nurses' improvement was especially remarkable - from 40% in 2010 to 70% in 2013; it was much more pronounced than that obtained in doctors - 30% in 2010 to 35% in 2013. After an initial increase, the proportion of HH performed by alcohol based hand rub (AHR) remained at 70% despite constant campaigns highlighting the benefit of AHR over soap and water for HH.

Conclusion

HH improvement doubled from baseline, which was 30%. Compliance has stabilised at around 60% despite ongoing reminders and staff training. Several publications report compliance levels of 90% or more but these were invariably done by ward staff and their validity may be questioned.[4] Conducting audits centrally, together with feedback and top management intervention, increased accountability, especially among nurses. Compliance among doctors still remains unacceptably low. We believe this is mainly due to the hospital's inability to exact similar accountability among doctors as that in nurses - a result of the high power distance in national culture.[5] Our hospital aims to maintain, and improve, the results achieved by adopting a long term sustainability and promotion strategy, using continuation and reinforcement of core activities over time.[6]

References

1. WHO. Guide to implementation of the WHO multimodal hand hygiene improvement strategy. 2009. http://www.who.int/gpsc/5may/Guide_to_Implementation.pdf
2. Pittet D, Hugonnet S, Harbarth S, *et al.* Effectiveness of a hospital-wide programme to improve compliance with hand hygiene. *Lancet* 2000; 356: 1307-1312.
3. Sax H, Allegranzi B, Chraïti MN, Boyce J, Larson E, Pittet D. The World Health Organization hand hygiene observation method. *Am J Infect Control* 2009; 37: 827-834.
4. Stone S, Kontowski G, Gallagher R, Storr J, Teare L. Keeping hand hygiene high on the patient safe Agenda WHO's call to action reminds us that "patients have a voice too". *BMJ* 2012; 346: f2699.
5. Borg MA, Camilleri L, Waisfisz B. Understanding the epidemiology of MRSA in Europe: do we need to think outside the box? *Journal of Hospital Infection* 2012; 81: 251-256.
6. Allegranzi B, Gayer-Ageron A, Damani N, *et al.* Global implementation of WHO's multimodal strategy for improvement of hand hygiene: a quasi-experimental study. *Lancet* 2013: 10: 843-851.

P19 Impact of baseline hand hygiene observation on disinfectant use as process indicator

Zlatko Fiolic, Zrinka Bosnjak, Ana Budimir, Vanda Plecko, Ivana Marekovic, Jasminka Horvatic

University Hospital Centre Zagreb, Croatia

Background

We report the findings of impact of baseline hand hygiene observation on disinfectant use as process indicator in vascular surgery setting of one Croatian Hospital.

Method

Prospective surveillance.

Results

Observation period from mid 03/13 to mid 07/13 with 250 opportunities. We monitored 12 nurses, 8 medical doctors and 2 auxilliary personnel. Hand hygiene observation was divided into five moments (before patient, before aseptic procedure, after fluid, after patient and after surroundings) and compliance was 51%, 100%, 100%, 68% and 0%. Doctors' compliance lower than nurses' compliance 54% : 75%. Handrub versus handwash for all actions was 30% : 70%. Relatively high overall compliance rate could be due to the Hawthorne effect. Increased medical soap/alcohol use during the observation period could reflect compliance rate as a process indicator. Doctors' compliance lower than nurses' compliance according the literature. Doctors generally are aware of the evidence but overestimate their own handwashing practices. Only 30% handrub could be the consequence of old habits (we have introduced handrub only several years ago). High compliance after body fluid could reflect fear of being infected, as well as higher compliance after patient contact than before patient contact. No compliance after touching patient surroundings could reflect absence of infection transmission knowledge ("patient zone").

Conclusion

Medical soap/alcohol use was very good indicator of high compliance rate during this observation period. Drawbacks of observation could be: time consuming and Hawthorne effect. Medical soap/alcohol use could be simplest way of monitoring hand hygiene compliance.

P20 Retrospective study of multidrug-resistant *Klebsiella pneumoniae* infections at Rigshospitalet in the period 2003-2012

Tove Havnøj Frandsen, Leif Percival Andersen

Department of Infection Control, University Hospital of Copenhagen, Denmark

Rigshospitalet was involved in the national outbreak of multidrug-resistant *Klebsiella pneumoniae* in 2007. These isolates were mainly resistant to ciprofloxacin and cefuroxime. We wanted to investigate whether the number of new patients infected with *Klebsiella pneumoniae* resistant to ciprofloxacin and cefuroxime, had returned to the same level as before the outbreak, when the outbreak was over. This was possible to investigate because Rigshospitalet since 2003 has registered all data electronically from the clinical microbiology examinations. All the clinical microbiology data belonging to *Klebsiella pneumoniae* isolates, which were resistant to ciprofloxacin and cefuroxime, were extracted. Furthermore, only the first time a patient was tested positive for multidrug-resistant *Klebisella pneumoniae* was used in the analysis, because it has been shown that resistant microorganisms can persist for many years in the faeces of the host. The analysis revealed, much surprisingly, that the number of new patients infected with multidrug-resistant *Klebsiella pneumoniae* each year were higher than before the outbreak and the curve did not peak before 2009, which was 2 years after the outbreak. The patients who got infections with this multidrug-resistant *Klebsiella pneumoniae* were mainly in the departments of nephrology and urology, but also the departments of gastroenterology and surgical gastroenterology had a slight rise. These four departments have a high exchange of patients and use the same intensive care unit. No other departments at Rigshospitalet have the same number of infected patients and it is therefore believed that there are some parameters present in these departments which favour the circulation.

P21 A new training and assessment support of knowledge in hand hygiene: CD-ROM type quiz prepared by the Department of Health Bizerte-Tunisia

Ridha Hamza[1], Hella Souilah[2], Ahlem Gzara[3], Hayet Kammoun[1], Mahmoud Dhaouadi[1]

[1]Regional Hygienic Service of Bizerte, Tunisia
[2]Institute Kassab of Orthopaedics, La Manouba, Tunisia
[3]Regional Health Directorate of Tunis, Tunisia

Introduction / aims

The year 2010 has been very prolific in Tunisia with regard to educational materials and training on hand hygiene: brochures, pamphlets, fact sheets, slide shows, quizzes. All these documents were developed by teams of volunteers and designed inspired by the WHO documentation issued in 2009 (adoption after adaptation). They were gathered in a toolbox for hand hygiene. The Department of Hygiene Bizerte participated in enriching the content of this toolkit for the development of a CD-ROM training and knowledge assessment of hand hygiene.

The development of this new medium should meet the need of healthcare workers and hygienists in training materials to hand hygiene adapted to new technologies and also to standardize and unify the concepts related to hand hygiene and harmonize methods and preservation techniques of hand hygiene and evaluation methods of knowledge on the subject.

Interventions

The development of this medium has used a multidisciplinary working group of volunteers. Validation of documents has been assigned to resource persons and experts in health care safety.

Results:

The CD-ROM has been designed for two types of use: learning and evaluation. It includes 5 sections:

- Section I: Test-Quiz with 50 questions;
- Section II: Quiz Training with 50 question and answer pairs;
- Section III: To know more consisting of a slideshow that can be used as a medium of animation training group (5 parts);
- Section IV: Hands, other views, slideshow featuring illustrations from drawings by hand painting;
- Section V: Hand across cultures, section with proverbs and quotes in different languages on the utility of hand.

Conclusions

Obviously, this is a first version that can't claim to be complete and final, which will be followed by successive versions certainly enriched and improved by taking into account the reactions and feedback from users.

P22 A website to help the promotion of health and safety of care in the area of Bizerte (www.hygienebizerte.com)

Ridha Hamza[1], Mahmoud Dhaouadi[1], Hafedh Abdelmelek[2], Ahmed Dhaouadi[2]

[1]Regional Hygienic Service of Bizerte, Tunisia
[2]Faculty of Sciences of Bizerte, Tunisia

Introduction/aims

Promoting health and safety of care has always been at the heart of the concerns of health professionals in the area of Bizerte (north of Tunisia). With its large experience in the field, the team of hygiene in Bizerte area continues to work in collaboration with other Tunisian and foreign teams with the support of various organizations and institutions in order to ensure the widest possible dissemination of any useful information on hospital hygiene and the prevention of health care associated to infections. It is in this context that the website www.hygienebizerte.com was created.

Interventions

The idea of creating this website was born during the organizing team of the day of health and safety of care in the Bizerte area (JRHSSB started in 1994) and during the annual North hygiene and safety of care (CNHSS in 2002). Thus, the website was dedicated initially to both events. Very soon, it spread to other uses including access to documents relating to the health and safety of care developed in the area of Bizerte.

The design of this website uses a volunteer multidisciplinary team. An accommodation was made possible through the support of Council office ''Best Conseil Ltd''.

Results

Regarding the content, different sections can be consulted on this website, including:

1 The section 'Home / Announcements'
2 The item 'History', with two sections: History and History of JRHSSB and CNHSS
3 The section 'Abstracts / Presentations of JRHSSB'
4 The section 'Alumni' of CNHSS
5 The section 'Useful Documents'

Regarding the container, the website is user friendly and easy reference.

Conclusions

This website is the only of its kind as far as we know in Tunisia. The site seems to have given full satisfaction and hitherto rendered enormous services to its users. However, it deserves to be revised and expanded periodically to ensure an increase of its use in the future.

P23 Measurement of adenosine triphosphate - a method for assessment of cleaning quality

Urszula Hryszkiewicz, Janina Kvist, Anita Jarodd, Per Bjark

Oslo University Hospital, Norway

Background

Oslo University Hospital wanted to increase cleaning quality without increasing resources used. The aim was also to harmonize cleaning, which meant reducing routine cleaning frequency in many locations, replacing it with cleaning "on demand" based on visual inspection. Time saved by reducing general cleaning was meant to be allocated to cleaning of high touch surfaces. We aimed to measure cleanliness before and after practice change and to evaluate the use of adenosine triphosphate (ATP) measurement for quality improvement.

Methods

We repeatedly sampled 13 high touch surfaces in each of 11 patient rooms in 4 units over a 2 month period. Sampling area was 10x10 cm; smaller objects were sampled in full. Sampling was done independent of the time of cleaning. Cleaning staff were not informed. ATP was measured by CleanTrace (3M) and expressed as relative light units (RLU). We used 500 RLU as a cutoff for cleanliness.

Results

A total of 728 samples were taken. Before change of cleaning procedures 148/362 (41%) samples had values of <500 RLU, compared to 108/366 (30%)

during the project. Median levels of <500 were found on 3/13 (23%) surface categories.

Conclusion

ATP measurement was easily implemented and was a valuable tool for measurement of cleanliness, giving rapid feedback to cleaner and surveyors. Using this method, we were able to show that the cleanliness level decreased, and that the aim of the practice change was not fulfilled, thereby making us able to modify procedures. The method is now used routinely for training and surveillance.

P24 Can toy wash and disinfection reduce bacteria load and sickness in daycare centres?

Tobias Ibfelt, Leif Percival Andersen

Department of Infection Control, University Hospital of Copenhagen (Rigshospitalet), Denmark

Introduction

Toys are a potential vector for the spread of infectious disease among children in daycare centres (DCCs), because it passes through the hands and mouths of many children every day. Our aim was to investigate whether systematical cleaning and disinfection of toys can reduce the numbers of bacteria on the toys and the number of child sick days in Danish DCCs.

Methods

The study included 12 DCCs with a total of 642 children aged 0-3 years. The intervention group (n=6) had cleaning and disinfection of toys and linen done every 2 weeks during winter 2013 by a professional company. The other group (n=6) served as controls. Illness days and causes were recorded for all children and bacteria samples were taken before and after the intervention from 10 selected spots.

Results

The average number of sick days per child for the intervention period was 5.1 days for the control group vs. 5.2 days for the intervention group (0.7 vs. 1.2 days due to diarrhoea, 2.0 vs. 1.6 days due to airway infections and 2.4 vs. 2.4 days due to other diseases). There was no significant difference between the two groups in terms of sick days. There was no significant reduction in total bacterial growth in either group, neither on the toys nor on any spots, following the intervention.

Conclusion

We were not able to show an effect of cleaning and disinfection of toys on the number of sickness days, or on the bacterial presence in the daycare environment.

A report of CMY-2 beta-lactamase in *Enterobacter cloacae* isolate in Bosnia and Herzegovina P25

Amir Ibrahimagic[1], Farah Kamberovic[2], Branka Bedenic[3], Selma Uzunovic[1]

[1]Cantonal Public Health Institute of Zenica-Doboj Canton, Zenica, Bosnia and Herzegovina
[2]Biotechnical faculty, University of Ljubljana, Slovenia
[3]School of Medicine, University of Zagreb, Clinical Hospital Center Zagreb, Croatia

Introduction

The aim of this study was to characterize plasmid-mediated AmpC (pAmpC) beta-lactamases in *Enterobacter cloacae* isolates from Zenica, Bosnia and Herzegovina (B&H).

Methods:

Double-disk synergy test and the phenylboronic acid confirmation test were used to detect extended-spectrum (ESBL) and pAmpC beta-lactamases. PCR was used to detect bla_{ESBL} and bla_{ampC} genes. Genetic relatedness of the strains was tested by pulsed-field gel electrophoresis (PFGE).

Results:

Among 12 ESBL- producing *E. cloacae*, one was obtained from the in-patient urine, two from outpatient urin, seven from the in-patient swab (three from surgical wound, one from each skin and soft tissue, an aspirate, glottis-tracheostoma and umbilicus) and two from outpatient swab (both were surgical wounds) samples. CTX-M-1, CTX-M-15, TEM-1 and SHV-1 beta-lactamases were identified. One (8.3%) *E. cloacae* isolates was positive for pAmpC beta-lactamase Sequence and Basic Local Alignment Search

Tool (BLAST) (http://blast.ncbi.nlm.nih.gov/) analyses identified bla_{CMY-2} gene. This strain co-produced TEM-1 beta-lactamase. The strain was resistant to all cephalosporins (with an exeption of cefepime) and to fluoroquinolones (MIC range 64 - >256 mg/L).

Conclusion

Accurate and rapid identification of plasmid-mediated AmpC producing organisms is necessary in order to avoid hospital outbreaks.

P26 Characterisation and antimicrobial resistance of *Escherichia coli* producing CMY-2 beta-lactamase in Bosnia and Herzegovina

Amir Ibrahimagic[1], Farah Kamberovic[2], Branka Bedenic[3], Selma Uzunovic[1]

[1]Cantonal Public Health Institute of Zenica-Doboj Canton, Zenica, Bosnia and Herzegovina
[2]Biotechnical Faculty, University of Ljubljana, Slovenia
[3]School of Medicine, University of Zagreb, Clinical Hospital Center Zagreb, Croatia

Introduction

The aim of the study was to determine a prevalence of plasmid-mediated AmpC (pAmpC) beta-lactamase in 30 extended-spectrum beta-lactamase (ESBLs)-producing *Escherichia coli* isolates, collected from the in- and outpatients in Bosnia and Herzegovina.

Methods

Double-disk synergy test and the phenylboronic acid confirmation test were used to detect ESBL and pAmpC beta-lactamases. PCR was used to detect bla_{ESBL} and bla_{ampC} genes. Genetic relatedness of the strains was determined by pulsed-field gel electrophoresis (PFGE).

Results

Thirty ESBLs-producing *E. coli* were obtained from 25 urine and five swab samples of different origins, e.g. two from surgical wounds, two from skin and soft tissue infections (SSTIs) and one from swab of a cannula. bla_{ampC} genes were detected in three (10.0%) isolates, all of them encoded CMY-2 gene. All pAmpC-positive isolates were obtained from the outpatients (two isolates were from urine samples, and one from SSTI). The mean age of the patients was 48 years (range: 06-72), two patient were females and one was male. Plasmid-mediated AmpC-positive *E. coli* isolates were resistant to cefoxitin (the MIC>250 mg/L). Two isolates co-harboured $bla_{CTX-M-1}$ and $bla_{CTX-M-15}$.

Conclusion

Failure to identify plasmid-mediated AmpC beta-lactamases could facilitate the spread of such organisms in the hospital environment.

P27 Reduction in needle stick injuries by interventional measures focused on change in behaviour

Namita Jaggi, Pushpa Sissodia

Artemis Health Institute, Gurgaon, India

Introduction

Needle stick injuries (NSI) in healthcare workers are a significant risk of occupational transmission of blood borne pathogens. Lack of awareness and carelessness on the part of healthcare workers is a major cause.

Interventions

This study was carried out for a period of 5 years (Jan 2008-Dec 2012). The healthcare workers were grouped as doctors, nurses, technicians, housekeepers and others. First intervention was the introduction of safety devices incorporated in Jan 2010. Second intervention included assessing and addressing the policy gaps in pre- and post exposure prophylaxis, education and training of staff and improvement of surveillance systems.

Results

The analysis showed that nurses (47%) and housekeeping staff (32%) had maximum NSI and improper sharps disposal (66.3%) contributed maximum to the total number. The root cause analysis for NSI occurrence showed carelessness at work (37.8%) as the major cause.

Conclusions

Use of safety devices, continuous training of staff and knowledge of the root cause for NSI can be helpful in preventing their occurrence.

P28

The risk of contamination of intravascular catheters using syringes prefilled with sterile saline

Anita Jarodd, Janina Kvist, Mylene Rimando, Anne Salomonsen, Urszula Hryszkiewicz, Bente Seljordslia, Birgithe Teige, Kjersti Hochlin, Egil Lingaas

Oslo University Hospital, Norway

Introduction

Approximately one third of catheter-associated bloodstream infections are caused by contamination of the catheter lumen during use. Prefilled syringes have theoretical advantages over other methods for the preparation of sterile infusion solutions, but no clinical studies have so far been published. We wanted to test the risk of contamination during a simulated catheter flushing in a clinical setting.

Methods

Infusion bags filled with broth for sterility testing (European Pharmacopoeia) and with an extension tube (BD Connecta, 10 cm) were used. Healthcare workers were asked to inject 10 ml of sterile saline from a prefilled syringe (BD PosiFlush ™ SP) via the stopcock into the bag, using aseptic technique. The bag was placed on the forearm of a healthy subject during the infusion. The aseptic technique was observed and recorded. The bags were incubated at 35°C for five days for the detection of growth.

Results:

450 healthcare workers participated. Growth of coagulase negative staphylococci or micrococci was detected in 5 bags (1.1%). Hand washing was carried out by 49.6% and disinfection of the stopcock by 1.1% before the procedure. A new sterile stopper was used by 33.7% after infusion.

Conclusion

The contamination rate with the use of pre-filled syringes was 1.1%. Previously we have shown contamination rates of 1.6% using syringes filled with sterile saline from single use plastic ampoules, and 0.9-2% using multi-dose containers. Accordingly, we could not demonstrate a reduced risk with prefilled syringes.

P29

Does level of education and length of seniority have an impact on execution of rub-in technique? A multicenter study in the capital region of Copenhagen

Anne Mette Klingenberg, Natasja Wharja Hansen

Hvidovre Hospital, Copenhagen, Denmark

Introduction

Incomplete disinfection of hand is a known risk factor for HAI. Adherence to WHO´s five moments is 80% but there is not available data on rub-in technique. Hand hygiene is the most important way to reduce infections, when executed at the right moments and with the correct technique. Previously auditing showed unsatisfied results in rub-in technique (good=30% vs. inadequate=70%).

Aim

Investigate whether differences in profession, gender and in seniority has an influence on rub-in technique in order to clarify targeted education.

Method

Observation of staffs' rub-in technique Using Derma LiteCheck® Box Together with ethanol added Visirub®. In addition data was collected from the staff regarding age, sex, education and seniority. The technique is graded as "good" when there is full compliance, "inadequate" when there are not covered areas on the hands.

Results

N=146 from two hospitals in Copenhagen. The majority was women (84%, N=123). The primary group was nurses (39%). Comparing gender and rub-in technique women presented slightly better good rub-in technique (39.8%, N=49) compared to the men (17.4% N=4), but there were no significant difference (OR=0.36 95% CI 0.11-1.12). For nurses, nurse assistants and doctors there were no significance regarding rub-in technique and seniority (p=0.73).

Conclusion

The results did not indicate any significant difference regarding to seniority, profession or gender. A larger sample size is probably needed to gain more

knowledge on how to construct a targeted educational program in order to gain better compliance in rub-in technique.

P30 *Raoultella planticola* causing urinary tract infection in a premature infant, the first case in Turkey

Mehmet Koroglu[1], Tayfur Demiray[1], Taner Hafizoglu[2], Mustafa Altindis[1]

[1]Sakarya University School of Medicine, Department of Medical Microbiology and Virology, Turkey
[2]Sakarya University School of Medicine, Department of Paediatrics, Turkey

Raoultella planticola, formerly known as *Klebsiella planticola* is gram negative, non-motile, anaerobic, encapsulated bacilli and is a very rare cause of infections in humans. This is the first case of neonatal infection with this microorganism which was isolated from urinary tract of a premature baby followed in neonatal intensive care unit. The isolate was resistant to empirically given antibiotics, ampicillin and gentamicin. The patient was successfully treated with Cefoperazone-sulbactam according to antimicrobial susceptibility test result.

P31 A survey of the level of knowledge of health professionals in the guidelines for the prevention of nosocomial infections in the intensive therapy unit and operating theatre

Costas Koulas

Cyprus Nurses and Midwives Association (CY.N.M.A) - Branch of Infection Control Nurses

The study aims to investigate that health professionals working in the intensive therapy unit (ITU) and in the operating theatre of Nicosia General Hospital, know the existence and the content of International Governing Directives, so that they take the essential measures for the prevention, the control and the confrontation of hospital infections. A lot of research in this field proved that the two selected departments are the most important departments in the hospital because hospitalised patients and patients who have undergone an operation, are more prone for nosocomial infections. For that reason, their working personnel must know and apply the directives that are formulated by infection control committees. Particularly, the knowledge of health professionals working in the above departments was studied and analysed in relation with the four Main International Governing Directives, which originate from the Centre of Disease Control and Prevention (CDC). These are the Basic Precautions, the Airborne Precautions, the Contact Precautions and the Droplet Precautions. The aim of this study is to sensitise the ITU and operating theatre health personnel for the acquisition of more knowledge and dexterities, in order to help themselves and to help and influence the other health personnel working in the hospital, to do correct handlings, contributing to the prevention of infection in their working place. The research findings will be used for the correct preventing application programs which will help the above personnel in the more effective prevention, control and confrontation of hospital infections.

Computer-mediated education and research for change – pre-registration to post-graduate P32

Karen Lee

University of Dundee School of Nursing and Midwifery, Dundee, United Kingdom

Two examples are presented of examining behaviour to implement change: using the computer for research to improve teaching, and using the computer for teaching to develop research.

Pre-registration

This pilot study aimed to determine the feasibility of using computer simulation to assess the complex decision making around HH and PPE use with the aim of informing teaching and improving compliance.

Methods

From the evidence-base, computer scenarios were developed around a virtual ward bay and 3 virtual patients. Eleven final year nursing student volunteers were audio recorded verbalising their HH and PPE

decision making whilst working through the assigned tasks. Transcriptions were then analysed into themes.

Findings

Practice deviated significantly from what had been taught. This was found to be due to a range of misconceptions, personal preferences, observed ward practices and experiences that had been acquired on clinical placement. Key themes included "just in case", resulting in overuse of PPE, and a concept of "dirty" tasks which required hand washing despite gloves being worn and gel being indicated. There was a common misconception that gel was not as effective as soap and water and was only suitable where speed was required.

Post-graduate

The MSc Advanced Practice (Infection: diseases, prevention and control) is an online distance learning MSc for practitioners from a wide range of countries. Coursework aims to improve practice in the practitioner's local area and includes a research module and a dissertation. Examples of dissertation projects will be presented.

P33 Observations and interventions to prevent catheter related bloodstream infections (CRBSI)

Tatjana Lejko Zupanc, Mateja Logar, Milena Prosen

University Medical Centre Ljubljana, Slovenia

Introduction

Hospital acquired infections (HAI) are considered the most frequent adverse event in health care delivery and resulting in increased morbidity and mortality, longer hospital stay and disability. CRBSI is prototypical of the causes and prevention of HAI, and ideal for study since it is the most reliably measured. Studies suggest that hand hygiene and a bundle of targeted interventions (catheter bundle) for catheter-related infections are effective to prevent BSI and other catheter related infections.

Methods

A prospective study was done between 01/2011 and 06/2013. The first phase was observation period (baseline) and in the second period hand hygiene intervention was introduced followed by catheter bundle introduction in the third period of the study. All adult patients with central lines hospitalized in the ICU's were included in the study. Every day evaluation of the catheter related infections was done.

Results

During the baseline period there were 3063 catheters and 25121 catheter days. The incidence of CRBSI was 2.4 per 1000 catheter days. Before the introduction of interventions education for medical staff was done in the ICU's. After both interventions we had 3305 catheters and 26380 catheter days. In this period the incidence of CRBSI was decreased to 1.1 per 1000 catheter days. Regular feedbacks were given to the leaders of the ICU's.

Conclusions

The study was done as part of PROHIBIT study. The results show an important decrease in the incidence of CRBSI after the implementation of a hand hygiene protocol and the introduction of catheter bundle.

P34 Validation of the structure and resources of nosocomial infection control team in hospitals ascribed to VINCat program in Catalonia (2006-2012)

Enrique Limon[1], Miquel Pujol[2], Francesc Gudiol[2,3]

[1]Programa VINCat. Departament de Salut Genralitat de Catalunya, Barcelona, Spain
[2]Bellvitge Hospital, Barcelona, Spain
[3]University of Barcelona, Spain

The main objective of this study was to validate the structure of the infection control team (ICT) in the hospitals adhered to VINCat program and secondary objective was to establish the consistency of resources of each centre with the requirements established by the program. Qualitative research consisting of an ethnographic study using participant observation

during the years 2008-2012. The centres were stratified in three groups by complexity and beds. The instrument was a semi-structured interview to members of the ICT. The transcription of the interview was sent to informants for validation. In November 2010 a questionnaire regarding human resources and number hours dedicated to the ICT was sent. During 2008-2012, 70 centres had been adhered to VINCat program. In 2012, the ICT of Group I hospitals had a mean of two physicians, one in full-time and one nurse for every 230 beds. In Group II, one physician part-time and one nurse per 180 beds and in Group III a physician and a nurse for every 98 beds, both part-time. In 2012, all hospitals had a structured ICT, an operative infection committee, and a hospital member representing the centre at the program as well as enough electronic resources. The hospitals participating in the program have now VINCat an adequate surveillance structure and meet the minimum technical and human resources required to provide high-quality data. However human resources are not guaranteed.

P35 Knowledge, attitudes and barriers to performance of hand hygiene among healthcare workers

Birgitta Lytsy[1], Anna Lubimova[2], Agita Melbārde-Kelmere[3], Olov Aspevall[4], Anna Hambraeus[1]

[1]Department of Clinical Microbiology and Infection Control, Uppsala University Hospital, Sweden
[2]North-Western State Medical University named after I. I. Mechnikov, Department of Epidemiology, Parasitology and Desinfectology, St. Petersburg, Russia
[3]Pauls Stradins Clinical University Hospital, Riga, Latvia
[4]Swedish Institute for Communicable Disease Control, Department of Antibiotics and Infection Control, Solna, Sweden

Background

The BARN (Baltic Antibiotic Resistance Collaborative Network) hand hygiene project engaging countries around the Baltic see focuses on hand hygiene through the WHO "Save Lives: Clean Your Hands" campaign. One of the tools in the multi-faceted programme was a knowledge, attitude and performance (KAP)-survey to identify cognitive and practical barriers to compliance with hand hygiene. The results before any interaction are presented here.

Materials and methods

The survey consisted of multiple choice-questions; four related to knowledge about hand hygiene and HCAIs, four related to when to perform hand hygiene and gloves, five were about factors that prevent staff from performing hand hygiene.

Results

Two hospitals participated from Latvia, two from Lithuania, six from Russia and four from Sweden, altogether 38 wards. Common assumptions were that the colonization with a resistant bacterium is the same as being afflicted by a HCAI, that barriers to perform hand hygiene are often due to the lack of hand rub available at near-patient sites. Hand rub was better tolerated in Latvia and Sweden than in Lithuania and Russia. Glove use instead of performing alcoholic hand rub were also more common in Lithuania and Russia.

Discussion

We found that addressing attitudes, knowledge and barriers to hand hygiene practice could serve as a tool in tailoring the educational programs for health care workers. The KAP survey performed in this study revealed some common key findings to be addressed.

Professionals' perceptions regarding implementation of cross infections reporting system P36

Mohamed Mahjoub, Ezzi Olfa, Bouafia Nébiha, Ben Cheikh Asma, Bayar Hassen, Njah Mansour

University Hospital Farhat Sached, Sousse, Tunisia

Introduction/aims

Cross infection have been recognized as a critical problem affecting the quality of health care and a principal source of adverse health outcomes. Epidemiological surveillance is an essential part of their prevention. In this study, our aim was to describe professionals' perceptions regarding the implementation of a cross infections reporting system.

Methods

A cross-sectional descriptive study conducted, in 2012, using a self-administered questionnaire to a representative sample of 380 health personal, in 16 hospital's services, in our University Hospital (99 doctors, 281 paramedical staff).

Results

The participation rate was about 76%. Only 37% of respondents perceived cross infections rate in our hospital as high or very high. Lack of cross infections reporting system in health units was reported by 71.8% of respondents, while the majority of them (85%) believe that cross infection surveillance is very or slightly important. 89.2% of respondents perceived the interest of establishing a cross infections reporting system. Finally, cross infection that should be the subject of report are those with multiple antibacterial drug resistance (23.9%) and those occurring in the context of epidemic (19.2%).

Conclusion

In the field of cross infection, it should be noted that the quality of information to report is a challenge to facilitate plan, implement and evaluate different activities to prevent adverse events.

P37 Partnership working to improve infection prevention in Romania

Ramona Marincas[1], Carole Hallam[2], Patrick Colquhoun[3]

[1]Zalau Emergency Hospital, Romania
[2]Calderdale and Huddersfield NHS FT, United Kingdom
[3]Medical Support in Romania, United Kingdom

An established partnership with a UK charity has enabled improvements in infection control at a hospital in Romania. Key priority areas have been identified for support; these include hand hygiene, education and the introduction of clinical audit.

Audit of hand hygiene facilities and compliance has provided data for the hospital to focus improvement work. Annual hand hygiene campaigns have been held using competitions, posters and use of an UV light box as a training aid to raise awareness.

The work is shared nationally by an annual National Conference held in Zalau. Also, an infection prevention book written by UK health professionals and translated by Romanian doctors and nurses has been provided free to hospitals all over Romania and has been described by one of the Romanian doctors as the first practical guide to improve infection control standards in his country.

Partnership working has provided improvements in the hospital and a wealth of development opportunities and experience.

P38 The revolving elder: the epidemiology of carbapenem resistant Enterobacteriaceae in Valle d'Aosta region

Roberto Novati, Marisa Mastaglia, Claudio Giacomazzi, *Gianluca Del Vescovo, Riccardo Papalia, Mirella Marana, Pier Giorgio Montanera, Chiara Galotto

Medical Direction Aosta Regional Hospital, Italy

Since June 2012 we started a survey of hospital patients colonized/infected with carbapenem resistant Enterobacteriaceae (CRE). By June 2013 CRE infection was diagnosed in 52 patients (mean age 77,8 years). Only the 30% of patients had just one hospital admission in the study period, the remaining had a mean of 1,6 admissions and 26,9% had been admitted in the 30 days before; next, 65,4% of patients had at least one ward change during hospitalization: finally 93,8% of cases were bedridden. We found Klebsiella pneumoniae in 80,8% of cases and Escherichia coli in 19,2%, mostly from urines (46,2%) and lower respiratory tract (13,5%); blood cultures were 7,6%. In the study period mean length of stay and lethality were 7,9 days and 4,3% in 15232 hospital patients, 18,5 days and 12,2% in 2556 controls (same age and Diagnosis-related-group of CRE cases) and 43 days and 48,9% in the 52 CRE patients, respectively. We describe a population of very old people infected/colonized with CRE, characterized by frequent readmissions, harmful

in-hospital transfers, and very severe clinical pictures. We suggest that hospital screening for CRE to be extended also to contacts of colonized patients and inappropriate hospital admissions of elders avoided whenever possible.

P39

Prevalence and risk factors associated with antibiotic resistance among nosocomial isolates of Pseudomonas aeruginosa in tertiary public hospitals in South Africa, 2005-2009

Peter Nyasulu[1], Olga Perovic[2,3], Jill Murray[3], Samuel Manda[5], Hendricks Koornhof[2,3]

[1]Department of Public Health, School of Health Sciences, Monash University, Johannesburg, South Africa
[2]School of Pathology, Faculty of Health Sciences University of the Witwatersrand, Johannesburg, South Africa
[3]National Institute for Communicable Diseases of the National Health Laboratory Service, Johannesburg, South Africa
[4]School of Public Health, Faculty of Health Sciences, University of the Witwatersrand, Johannesburg, South Africa
[5]Department of Biostatistics, Medical Research Council, Pretoria, South Africa

Aim

To assess prevalence and factors associated with antibiotic resistance among nosocomial isolates of Pseudomonas aeruginosa bacteraemia among patients admitted in tertiary public hospitals in South Africa.

Methods

A retrospective analysis of blood culture isolates of Pseudomonas aeruginosa bacteria from seven tertiary public hospitals was carried out. Data were collated from diagnostic microbiology laboratories of the National Health Laboratory Services between July 1, 2005 and December 31, 2009. Multivariable logistic regression models were constructed to assess significant risk factors associated with antibiotic resistance.

Results

A total of 1561 nosocomial isolates of Pseudomonas aeruginosa were identified over this period. The prevalence of antibiotics resistance was 52% and highest in the 30-39 year age-group and similar between males and females. Sixty seven percent of Pseudomonas aeruginosa resistant isolates were from Steve Biko Pretoria Academic hospital. Mean colistin resistance rate of 1.9% (range 0.0-13.3%) was observed. Pseudomonas aeruginosa resistance to meropenem showed a significant increasing trend from 2006 (27.5%) to 2009 (53.9%) ($p<0.001$). Age-group less than 5 years, female gender, hospital location and year of infection were significant risk factors associated with higher rates of antibiotic resistance.

Conclusions

The prevalence of antimicrobial resistance was high and showed a significant increasing trend among individual agents i.e. colistin, meropenem, cefepime among others. Continued surveillance of antimicrobial resistance among bloodstream nosocomial acquired infections need to be enhanced. Such data would increase our understanding of the magnitude of the antibiotic resistance and provide objective evidence to re-enforce policies and practices aimed at containing antibiotic resistance.

Key words

antimicrobial resistance, blood culture, nosocomial infection, surveillance, South Africa.

P40

Understanding laboratory methods and their impact on antimicrobial resistance surveillance, at Muhimbili National Hospital, Dar es Salaam, Tanzania

Peter Nyasulu[1,2], Mabula Kasubi[3], Respicious Boniface[4], Jill Murray[2]

[1]Department of Public Health, School of Health Sciences, Monash University, Johannesburg, South Africa
[2]School of Public Health, University of the Witwatersrand, Johannesburg, South Africa
[3]Department of Microbiology, Central Pathology Laboratory, Muhimbili National Hospital, Dar es Salaam, Tanzania

[4]*Muhimbili Orthopaedic Institute, Muhimbili National Hospital, Dar es Salaam, Tanzania*

Introduction

The study sought to describe laboratory methods and blood culture procedures and their impact on antimicrobial resistance surveillance among nosocomial bacteria.

Methodology

We conducted a systematic audit of blood cultures procedures and practices in the Department of Microbiology, Central Pathology Laboratory at Muhimbili National Hospital, between 19th and 23rd March 2012.

Results

The study identified that a total of 25-30 blood culture specimens were received each day an indication of low volumes of blood culturing at this site. More blood culture requests came from the neonatal unit of the hospital, and were performed manually with high culture negative specimens. The laboratory performed antibiotic susceptibility testing as per the CLSI guidelines. No vancomycin resistance was ever reported at this site. All blood culture results were entered into the JEEVA laboratory information system, where results could be accessed by clinicians in the wards and data could be retrieved to assess patterns of antimicrobial resistance. Blood culture data entry system lacked quality control checks hence numerous errors and missing data were observed.

Conclusions

Our results support the relevance of having improved laboratory procedures and good quality blood culture since surveillance of antimicrobial resistance primarily depends on good laboratory procedures, good quality and reliable blood culture data. This would essentially minimise imprecise estimates of rates of antimicrobial resistance at this hospital.

Keywords: antimicrobial resistance, microbiology, surveillance, laboratory, Tanzania.

Clostridium difficile: results of an active surveillance system in Azienda Sanitaria di Firenze

P41

Anna Poli, Enrica Fornai, Elisabetta Paoletti, Denise Borgioli

Health Agency Florence (Azienda Sanitaria Firenze), Italy

Clostridium difficile is one of the major organism of healthcare-associated diarrhea, burden by increased incidence and severity.

Azienda Sanitaria Firenze encourages an active surveillance for CDAD (C. Difficile Associated Disease), since 2010, to measure the phenomenon, identify main risk factors, follow the epidemiological trend in the complications' aspects, re-infections, epidemics and the use of combined and / or prolonged antibiotic therapy.

In 2012 were notified 246 cases of CDAD: 229 patients were aged ≥ 65 years (93.9%), 15 patients were adults <65 years (6,1%). 174 came from their home (70,7%) and 72 from other care settings (29,3%). The risk factors analysis show that those most involved in the development of CDAD is re-hospiatlization in the three months before (152 patients, 61,8%), antibiotic therapy (145 patients, 58,9%), and age ≥ 65 years (9,8%). Acutally our challenge is the management of re-infections: in 2012 were reported 34 cases (13,8%).

Azienda Sanitaria Firenze provides, for the cases the adoption of a strategy of treatment with metrnidazole and vancomycin. 37,8% of cases were treated with metronidazole, 28% vancomycin and 28% with both.

The system of an active surveillance through the feedback of the results becomes an effective tool for analysis and review of the quality of healthcare. Understanding and measuring the phenomenon and identify different areas for improvement encouraging

draft operational methodologies as check-list, contromteams and educational moments of implementing the improvement and adherence to best practices.

P42

Investigation of *Aspergillus fumigatus* in a critical care department

Philip Pugh

Gateshead Health NHS Foundation Trust, United Kingdom

During June 2013 concerns were raised following an unusual rapid wound infection on a patient in critical care department (CCD) with *Aspergillus fumigatus* cultured from both a wound swab and drain fluid. At this time patient had an open wound management system in place and was under clinical review by the tissue viability nurses with a view to using a 'VAC' wound management system. The case prompted investigation into other *Aspergillus* isolates from CCD. A further 4 patients were identified between January and June 2013 with positive *Aspergillus* samples. An in-depth review was undertaken to determine clinical significance. The review identified four other patients on CCD with positive *Aspergillus* cultures during 2012/13 two of which were clinically significant. Timelines were analysed of all previous positive patients. Three patients were identified as being clinically infected with *Aspergillus* species. Further investigation for any extraneous links was carried out such as use of clinical equipment such as ventilator, bronchoscopes etc. no links could be established due to the same clinical equipment identified through recorded asset numbers in clinical case notes. throughout this time extensive construction work was taken place on site though not within the CCD itself and prior demolition had also taken place. Due to the many issues associated with *Aspergillus* infection identified within the CCD a number of meetings were held with the involvement of Public Health England, Estates and facilities, clinical staff and external contractors to establish a root cause and initiate appropriate actions, shared learning and appropriate recommendations.

P43

Reducing transmission of antibiotic-resistant organisms (AROs) through daily antiseptic patient bathing

Paula Raggiunti

Rouge Valley Health System, Toronto, Canada

A quality improvement intervention was initiated February 2012 to reduce facility-acquired antibiotic-resistant organisms (AROs) targeting MRSA, VRE and ESBL. As part of this effort, the team introduced an antiseptic patient bathing protocol across five medical units which were experiencing higher rates of ARO transmission. A non-rinse topical 2% Chlorhexidine Gluconate (CHG) antiseptic skin cleanser applied through pre-saturated cloths was introduced for daily patient bathing. Prior to initiating this quality improvement effort on a given medical unit, staff received education and training on the new bathing protocol with at least 80% of staff trained as one control measure. The aim of this initiative was to reduce ARO transmission by 40% over an 18 month period across five medical units. This effort was initiated when a root cause analysis documented inconsistent practice and poor compliance with the application of a bottled form of CHG which was being diluted in the patients' bath water and at times was unable to be tolerated on patients' skin. A non-rinse application was substituted for the existing antiseptic to ensure consistency in the bathing protocol thus enabling a reduction of ARO transmission. Baseline data indicates an average of 136 ARO transmissions across the five medical units over the 18 month period preceding this quality improvement effort. In the 18 month period post project implementation there were 65 ARO transmissions across the five medical units representing a reduction of 54%.

P44

Cost-effectiveness evaluation of MRSA screening strategies in English National Health Service (NHS) hospitals

Julie Robotham[1], Sarah Deeny[1], Christopher Fuller[2], Barry Cookson[2], Susan Hopkins[3], Joanne Savage[2], Sheldon Stone[2]

[1]Public Health England, London, United Kingdom
[2]University College London, United Kingdom
[3]Public Health England, Royal Free Hospital NHS Foundation Trust

Objectives
The English NHS introduced universal admission screening for MRSA in 2010. Here we evaluate the effectiveness and cost-effectiveness of this policy for the Department of Health.

Methods
An individual-based stochastic dynamic transmission health economic model was developed, and parameterised using evidence from the literature and data from 86% of English acute hospitals participating in the National One Week audit of MRSA screening, performed in May 2011. The model was used to compare six strategies: no screening, universal screening with/without pre-emptive isolation of previously known MRSA, screening high-risk specialties and two checklist activated screening policies. The screening method was chromogenic agar and accompanying interventions were isolation and decolonisation. Incremental costs and health benefits (quality adjusted life years (QALYs)) were evaluated under different MRSA prevalences, transmission potentials and NHS hospital types. Probabilistic sensitivity analyses were conducted.

Results
The current universal screening policy was found to be unlikely to be cost-effective at the usual NHS willingness to pay threshold of £30,000 (€35,500)/QALY. Screening high-risk specialties was, however, cost-effective (or marginally above threshold) in all hospital types (at £9,964, £10,777 and £31,077 per QALY). Reverting to this policy could save the NHS £250m/year year for a minimal rise in infections (2/hospital/year). Certainty in decisions between strategies did not exceed 30% due to uncertainty in intervention effectiveness.

Conclusion
The current universal screening policy is unlikely to be cost-effective at the whole hospital level. Screening high-risk specialties is likely to be a more cost-effective national policy in terms of cost per QALY gained.

Train - the – trainers: How to organize mandatory education in hospital hygiene in a tertiary care hospital

P45

Birgit Ross, Walter Popp
University Hospital Essen, Germany

Objective
The hygiene ordinance of the German state of North Rhine-Westfalia requires the annual training of the entire hospital staff in hygienic issues. This education has to be documented by name. In large hospitals thousands of employees have to be trained, which is a great challenge for the trainers – shift work, holidays and part time jobs are complicating the participation of staff members in training programs.

Methods and results
In our hospital each department has a hygiene link doctor and each ward a hygiene link nurse who are trained for one week. We conducted additional special trainings for these persons every six months on a special issue. The first theme which was discussed profoundly was "reducing sepsis campaign", followed by "preparation/application of intravenous drugs", "gram negative multi-resistant bacteria" and "nosocomial infections". All participants (link staff) were provided with powerpoint presentations and posters which summarized the essentials of the themes. The participants were asked to deliver the information to their teams and departments (e.g. short presentation in team meeting on the ward). Also they should keep records of the participants. In 2014, the documentation will be controlled during regular hygiene audits.

Conclusion
"Train-the-trainers" concept might be a solution for mandatory education of the staff in big hospitals with lots of employees. Future audits will show how many staff members can be reached by it and whether changes to this concept are necessary.

P46

Impact of the ventilator bundle on ventilator-associated pneumonia in three intensive care units in Egypt - pilot study

Tamer Saied[1], Soad F Hafez[2], Ghada Abdelall[3], Nanees Adel[3], Iman Ahmad[2], Elham Hassan[2], Ahmed Elmenshawy[2], Maha Talaat[1]

[1]U.S. Naval Medical Research Unit No.3, Cairo, Egypt
[2]Alexandria University Hospitals, Egypt
[3]Ain Shams University Hospitals, Cairo, Egypt

Ventilator-associated pneumonia (VAP) is the most prevalent nosocomial infection in Egyptian intensive care units (ICUs). This is the first trial in Egypt to implement a VAP bundle and measure its impact. A VAP bundle has been implemented during August 2012-August 2013, in three Egyptian ICUs in two acute-care hospitals, based on the ventilator bundle of the Institute of Healthcare Improvement. Hospitals' infection control teams provided education to ICUs' staff and monitored compliance with the VAP bundle using a standardized checklist. Compliance rate was calculated as the percent of patients for whom all items of the bundle had been performed. The impact was assessed as the reduction in the VAP rate/1000 ventilator days (VDs). The overall compliance rate in ICUs A, B, and C was almost comparable (48.9%, 57.1%, and 53.4% respectively). The highest compliance rate was observed for elevation of the head of the bed (range: 93.8%-100%), whereas a low compliance was documented with assessment of readiness to extubate (range: 52.8%-62.5%). VAP rates decreased significantly in ICU A (20.4 to 3.9/1000 VDs, p0.05). In conclusion, ventilator bundle was associated with a significant reduction of VAP incidence. However, compliance with the individual VAP bundle components varied according to different elements. Factors affecting compliance such as ICU staff motivation, and availability of supplies should be addressed to maximize the impact of the VAP bundle in Egyptian ICUs.

P47

Association of general risk factors for healthcare-associated infections with probability of death in the ICU of a teaching hospital in Ujjain, India

Erika Anne-Marie Saliba[1,2], Ashish Pathak[3,1,4], Nadia Arshad[1,2], Megha Sharma[5], Ashish Sharma[6], Senia Rosales-Klintz[1,2], Cecilia Stålsby Lundborg[1,2]

[1]Global Health/IHCAR
[2]Department of Public Health Sciences, Karolinska Institute, Stockholm, Sweden
[3]Ruxmaniben Deepchand Gardi Medical College, Ujjain, India
[4]Department of Women's and Children's Health, International Maternal and Children's Health Unit, Uppsala, Sweden
[5]Department of Pharmacology, Ruxmaniben Deepchand Gardi Medical College, Ujjain, India
[6]Department of Medicine, Ruxmaniben Deepchand Gardi Medical College, Ujjain, India

Introduction

Healthcare-associated infections (HAI) are a major public health concern. There is a paucity of data from low- and middle-income countries (LMIC).

Aim

To determine the association of general HAI risk factors with probability of death at admission to intensive care (ICU).

Methods

This cross-sectional study was carried out at a teaching hospital in Ujjain, India. Patients admitted to ICU for >1 day were included and risk factor data collected. They were diagnosed using WHO disease classification (version-10). 'Mortality Probability Model' was used to predict patient's death rate at admission. Relationship between risk factors and probability of death were explored using Pearson X^2 tests, with p=<0.1 as a cut-off for insertion into a logistic regression model. Odds ratios and 95% C.I. were calculated. *P*-value of 0.05 was considered significant in the final model.

Results

Our preliminary findings are based on 300/2266 patients, admitted January-June, 2011. More than half were male (60%). Mean age was 52±18 years. Most

common primary diagnoses were, circulatory system (50%), infectious and parasitic (8%), and endocrine, nutritional and metabolic (8%) diseases. General risk factors for HAI considered were, diagnosed diabetes (p=0.041), suspected diabetes (p=0.349), previous antibiotic treatment (p=0.215), previous intramuscular injection and previous hospitalisation (maximum four weeks prior admission) (p=0.412; p=0.246). Independent risk factor for probability of death was diagnosed diabetes (O.R=2.708; p=0.033).

Conclusion

These preliminary findings suggest that critically ill patients with diagnosed diabetes are at high risk of mortality.

P48 Improving physician hand hygiene compliance using a theory-based knowledge translation intervention

Kathryn Suh[1,2], Janet Squires[3,2], Stefanie Linklater[3], Natalie Bruce[1], Kathleen Gartke[1,2], Ian Graham[3], Alan Karovitch[1,2], Virginia Roth[1,2], Karen Stockton[1], John Trickett[1], Jim Worthington[1], Jeremy Grimshaw[3,2]

[1]*The Ottawa Hospital, Canada*
[2]*University of Ottawa, Canada*
[3]*The Ottawa Hospital Research Institute, Canada*

Background

Hand hygiene (HH) is considered to be one of the most effective methods for preventing healthcare-associated infections. However, HH compliance among healthcare workers, more specifically physicians, is suboptimal.

Objectives

1. Identify barriers and enablers to physician HH compliance at a tertiary-care centre in Ottawa, Canada;
2. Develop and pilot a theory-based knowledge translation (KT) intervention to increase compliance.

Methods

This study consisted of three phases. In Phase 1, we identified barriers and enablers to physician HH compliance using key informant interviews with physicians and residents in medicine and surgery, focus groups with HH experts, and non-participant observation of HH audits. An interview guide was developed based on the Theoretical Domains Framework (TDF), a behaviour change framework comprised of multiple psychological and cognitive theories related to behaviour change. In Phase 2, a theory-based KT intervention was developed. In Phase 3 we piloted our KT intervention on medicine and surgery inpatient units.

Results

Forty-two key informant interviews and 2 focus groups were held. Nine of 14 TDF domains were found to be important to physician HH. Our intervention targeted five domains: environmental context and resources; knowledge; memory, attention, and decision processes; skills; and social influences.

Conclusions

A better understanding of the barriers and enablers to physician HH has allowed us to develop a theory-based KT intervention to address physician HH compliance. Increasing HH compliance in physicians should improve quality of care for patients and result in a safer hospital environment.

Infection control (IC) template for oncolytic virotherapy administration at the British Columbia Cancer Agency (BCCA) P49

Eva Elisabeth Thomas[1], A Chant[2], K Mallory[2]

[1]*British Columbia Children's Hospital, Vancouver, Canada*
[2]*British Columbia Cancer Agency, Vancouver, Canada*

Introduction/aims

The recent introduction of oncolytic viruses as novel anticancer agents presents unique communication, safety and IC issues. A promising anticancer treatment candidate, reovirus (Reolysin®, a biosafety level 2 agent) has entered into phase III human clinical trials, and the BCCA is participating in 4 phase II studies with this agent. We present a comprehensive IC-focused solution for Reolysin® administration, with the aim of using this approach as a template for future oncolytic virus regimens.

Interventions

A multidisciplinary working group was formed (IC, pharmacy, operation-leads, front-line staff, primary investigators and occupational health). The following areas were discussed:

1. Risk assessment (staff and patients);
2. Pharmacy (drug-preparation and spill-management);
3. Drug-administration (patient placement and personal protective equipment (PPE) requirements, patient/staff training and engagement, environmental cleaning etc.);
4. Placement of potentially symptomatic readmitted patients;
5. Post exposure management (needle-stick; mucosal/ocular splashes).

Results

The creation of a multidisciplinary working group improved communication and general understanding of issues and concerns and bridged the gap between operation leaders, primary investigators, IC and front-line staff. Agreement was reached regarding the overall management from an IC perspective to ensure safe administration of Reolysin® to study-patients.

Conclusion

This is likely the first of many oncolytic virotherapy regimens to be introduced at BCCA. We propose that a pro-active, standardized IC approach, with specific emphasis on staff/patient training and engagement is key to ensure patient and staff-safety and will also avoid delays in implementation of clinical trial protocols in this new and rapidly evolving therapeutic field.

P50 The first molecular epidemiology study of human rabies virus in Georgia

Lela Urushadze[1,2], Andres Velasco-Villa[3], Ketevan Sidamonidze[1], Gvantsa Chanturia[1], Tsiuri Tushishvili[4], Paata Imnadze[4]

[1]National Center for Disease Control Lugar Center, Tbilisi, Georgia
[2]Ilia State University, Tbilisi, Georgia
[3]Centers for Disease Control and Prevention (CDC), Atlanta, USA
[4]National Center for Disease Control, Tbilisi, Georgia

Background

Rabies is an acute and fatal infection of the central nerves system. Around 40-100 animal cases and 6-12 human cases of rabies are documented in Georgia every year. Until 2011, diagnostic was based only on presence of "classical" rabies signs and therefore no rabies virus isolates have been studied.

Objectives

The objective of this work was to genetically characterize the rabies virus isolates in order to define virus group circulating in humans in Georgia.

Methods

14 years old boy was bitten by stray dog on May 30, 2011; he could not receive post exposure vaccination; became symptomatic on July 23; died six days later. Saliva for laboratory investigations was taken on July 25. Study was conducted in Atlanta CDC together with NCDC Georgia staff. Hemi-nested RT-PCR was performed to investigate rabies epidemiology, establish species and geographical links.

Results

The phylogenetic analysis of the partial N-gene sequences of Georgian rabies virus isolate indicates the direct geographical association with the Middle-East Eurasia rabies virus and demonstrates the close relationship 97.7 - 99.0% identity to Turkey virus strains. Georgian scientists were trained on epidemiology characterization of viral variants by antigenic typing and genetic sequencing of virus.

Conclusion

This study initiated establishment of laboratory investigations in Georgia. As a result it helps Georgian epidemiologist to confirm rabies diagnosis; allows researchers to use phylogenies to visualize evolution, improves surveillance system and rabies control in our country.

P51 Global observational study bedpanmanagement (2010-2013)

Gertie van Knippenberg-Gordebeke

KNIP Consultancy Infection Prevention, Venlo, The Netherlands

Introduction

Bedpanmanagement includes: patient-care, transport, place to empty, decontamination, drying, safe storage and the choice of the utensils. Bedpans are categorised as non critical medical devices with no attention for the risk of transmission and environmental contamination by handling faeces and urine. The author fulfilled studies to observe practice of bedpanmanagement and awareness of the ISO Standard 15883 for washer-disinfectors (WD) part 3 what states that manual procedures must be avoided as much as possible.

Methods

1. Visits around the globe;
2. Planned and secret shopper visits in hospital-sluice rooms (34);
3. Experience exchange with infection prevention professionals (279).

Results

- Nurses or nurse aids do the job without any guideline;
- Bedpans without covers are transported to empty in a toilet or slobhopper;
- Visible contamination by splashes and splatters;
- Cleaning only by rinsing or spraying with cold water;
- Disinfection without attention for the right procedures;
- Not well equipped sluice rooms with poorly maintained equipment;
- Bedside nurses and physicians do not realize the danger manual handling faeces;
- All colleagues are happy that bedpanmanagement is brought to their attention;
- Many WD or macerators are malfunctioning or unused discussion practice depends on habits and rituals instead of best practice. Hospitals have to recognize their weakness in bedpanmanagement and must set improvements and investments within their possibilities. This includes attention for sluice-rooms must and ISO Standard 15883.

P52 An organizational and informational system to improve the management of healthcare associated infections in hospitals

Luis Velez Lapão

WHO Collaborating Center for Workforce Policy and Planning - Instituto de Higiene e Medicina Tropical - Universidade Nova de Lisboa, Lisbon, Portugal

The OSYRISH-FCT project aims at providing new insights on better and innovative ways of dealing with healthcare acquired infections (HAI) in hospitals by addressing communication and behavioural issues. International studies show that approximately one third of infections acquired in the course of hospital care are avoidable, and among major causes are poor communication, infection diagnosis difficulties and processes (e.g. hands hygiene). In Portugal, it is estimated that 11% of persons admitted in hospital acquire some sort of infection, resulting in an estimated annual cost of 280 million Euros. The methodology included development of two interventions to reduce HAI: an organizational and a smart-automatic HAI information flow system. The interventions have been designed after the analysis of communication flows in selected hospitals and using communication theory. Therefore a study and assessment of existent HAI communication and management processes was performed before and after the interventions. Participatory-action research and design-science-research (DSR) are used to address the design and implementation of the interventions. A sample of 4 hospitals (one urban-public and academic hospital, other urban-private, other rural-public and a hospital in Cape Verde) participated in the research. The application of DSR to support and improve HAI management is a significant contribution to HAI science. Additionally, the use of automatic information workflow systems seem to be an important artifact to help addressing proper HAI management. The results of this research show an important impact on the quality and costs of healthcare by further increasing the optimization of resources usage and reducing HAI cases.

P53

Impact of post discharge surveillance methodology on surgical site infection rates – Mater Dei Hospital, Malta

Simeone Zerafa, Claire Farrugia, Michael A. Borg
Mater Dei Hospital, Msida, Malta

Surgical site infections (SSI) are among the leading causes of nosocomial morbidity and increased health care costs. Rates of SSI have been used to benchmark hospital performance in terms of adherence to infection prevention protocols. However SSI rates depend heavily on the methodology adopted, especially when a significant proportion of SSI manifest themselves after discharge from hospital.

In Mater Dei Hospital Malta, the methodology for SSI surveillance includes a questionnaire sent to all patients on the 30th day/12 months post surgery, review of the patients' medical files, review of laboratory clinical samples taken and identification of any readmission following surgery. During the study period an overall rate of 4.6% (n=67) of patients were identified as having an SSI according to the European Centre for Disease Control SSI definitions. Initial indication of SSI was confirmed by the consultant in charge of the patient. 66% (n=44) of SSI were identified from a combination of one or more of the following namely; notes from patients' medical files, clinical samples taken postoperatively within the 30 day/12 month period, from readmissions and questionnaires sent to patients. However 34% (n=23) of SSI were identified exclusively from questionnaires received from patients. Although the process of sending and receiving questionnaires from patients is laborious, our findings show that including the questionnaire in SSI surveillance ensures a better picture of SSI rates and to provide a mechanism for reducing the rate of these infections.

P54

Prevalence and vaccination status of Hepatitis B and C in healthcare workers

Abdulaziz Zorgani[1], Abdul-Nasser Elzouki[2], Salwa M Elgamay[3], Omer Elahmer[4], Abdulla M El-Mansoury[5]

[1]Faculty of Medicine, Tripoli University, Libya
[2]Department of Medicine, Hamad General Hospital, Hamad Medical Corporation, Doha, Qatar
[3]Faculty of Medical Technology, Derna, Libya
[4]National Center of Diseases Control, Tripoli, Libya
[5]Faculty of Science, University of Benghazi, Libya

Introduction/aim

To determine the prevalence of HBV and HCV among healthcare workers and the risks related to occupation, working period as well as vaccination status.

Methods

Cross-sectional study of 601 healthcare workers from five major hospitals in eastern Libya.

Results

The overall HBsAg was 1.8%. Anti-HBc, HBeAg and Anti-HBe were also determined. HBV-DNA was positive in 55% of positives. Half of healthcare workers were immune. Anti-HCV antibodies was 2.0% and HCV-RNA was positive in 33.3% of them. 52% of the healthcare workers received full vaccination doses. Nurses and nurse-aides have the highest prevalence rates of both HBsAg and Anti-HCV. Doctors had high Anti-HCV (2.2%). More than half of healthcare workers have Anti-HBV antibodies positive due to vaccine exposure than due to past hepatitis B infection. Gynaecology ward, dialysis units and dentists had higher rates of HBV. HCV was found among medical and surgical wards. There was no difference between HBsAg status and the work period.

Conclusion

Reinforcing current vaccination programmes.

P55 Rapid and reliable diagnostic algorithm for detection of *Clostridium difficile*

Özlem Yoldas[1], Mustafa Altindis[2], Berna Bozca[1], Davut Cufali[1]

[1]*Afyon Kocatepe University School of Medicine, Turkey*

[2]*Sakarya University School of Medicine, Turkey*

Introduction

Clostiridium difficile grows in the colon flora, destroyed by antibiotics and it spreads by faecal-orally. *C. difficile* colonizes with toxins after antibiotic-associated diarrhoea and leads pseudomembranous enterocolitis. *C. difficile* should be considered in the patients with the diagnosis of diarrhoea whom describe the (without depending on the duration of use) use of antibiotics for eight weeks or hospitalized for three days at least. In our study, we aimed to find out the frequency of *C. difficile* in diarrheic patient of our region and evaluate the diagnostic algorithm for detection *C. difficile*.

Material and method

In this study, we compared three methods for *C. difficile* detection in 95 stool samples: an enzyme immunoassay (EIA) for toxins A/B (Accudiag), an EIA for glutamate dehydrogenase (GDH) (Wampole), and a real-time polymerase chain reaction (PCR) assay (Genexpert). 50.5% (n: 48) of the patients were male. 32 samples were taken from inpatients; 50 from outpatients; 13 were from patients of intensive care unit.

Results

When 95 specimens were examined, 28 samples were positive for GDH. *C. difficile* toxin was determined in 6 patients with PCR, in 9 patients with EIA for toxins. NAP 1 was not determined. The rate of positive toxigenic *C. difficile* in samples was 5.1%. The patients were found out to be positive for *C. difficile* who used cefaclor, ampicillin-sulbactam, ertapenem and piperacillin-tazobactam antibiotics. 83.3% of patients, who had hospitalized in intensive care unit over 7 days, were PCR positive.

The sensitivity and specificity of *C. difficile* toxin A / B according to PCR were found 67% and 91%, respectively. The sensitivity and specificity of toxin ELISA was 67% and 94%; GDH sensitivity and specificity was 100% and 75%, respectively.

Conclusion

C. difficile toxin usually tested for diagnosis of the antibiotic-associated diarrhoea. Toxin is affected by temperature conditions and decomposition in faeces, in this way wrong negativity occurs. Since GDH test is more sensitive; it might be used as a screening test in need of determining toxigenic strains. If GDH as a screening test is used in the diagnostic algorithm it will prevent false negativities. An adoption of triple diagnosis algorithm with glutamate dehydrogenase as a screening test will increase sensitivity and specificity of the *C. difficile* diagnosis.

Table 1: Examples of ***C. difficile*** positivity rates by gender

Sex	GDH	Toxin A / B ELISA	Toxin A / B Latex	PCR
Female (n:47)	16	4	4	3
Male (n:48)	12	5	8	3
Total (n:95)	28	9	8	6