Volume 16, Supplement 1

ISSN 1996-9783

International Journal of Infection Control

Abstracts

Twentieth Congress of the International Federation Of Infection Control (IFIC)

11-14 March 2020
Belgrade, Serbia

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ABSTRACTS

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Oral Presentations

Assessment of the use of chlorhexidine digluconate gel for cord care at Kangundo level 4 hospital

Clarice Ambale, Brian Ngatia

Kangundo Level 4 Hospital, Nairobi, Kenya

Background:

Sepsis continues to be an important cause of morbidity and mortality in neonates. Proper care of the cord can prevent many of these cases of sepsis and hence reduce neonatal mortality rates. In Kenya, the use of chlorhexidine digluconate (CHX) gel was introduced to scale in 2016. This study sought to find out the knowledge, practices and attitude on its use in Kangundo Level 4 hospital.

Methodology:

The study was carried out at Kangundo level 4 hospital between June and August 2019. It was a descriptive cross-sectional study with both quantitative and qualitative components.

Results:

A total of 19 clients and 24 healthcare workers (HCWs) were interviewed and two focus group discussions held. All the 19 clients had delivered in the hospital and only three were first-time mothers. Education on how to use CHX was given to 16/19 (84%) of the clients interviewed. Duration of application varied among clients; 4 days 5/19 (26%), 7 days, 12/19 (64%) and until the stump falls off, 2/19 (10%). Twenty of the 24 HCWs (83%) interviewed advised the patients on cleaning the cord prior to application of CHX, frequency of application varied among the HCWs interviewed.

Conclusion and recommendation:

There was poor understanding on the use of CHX among both clients and HCWs at Kangundo level 4 hospital. Cleaning of the stump prior to gel application is important to prevent accumulation of the dry gel. There is need for training and development of a standard operating procedure on use of CHX.

Awareness and knowledge of medical students about healthcare associated infections, infection control measures and hand hygiene

Mia Borkovic[1], Ljiljana Markovic-Denic[2]

[1]Dr. Ausbüttel Stiftungsprofessur für Translationale Wundforschung, Witten Herdecke, Germany

[2]Institute of Epidemiology, Faculty of Medicine, University of Belgrade, Serba

Introduction:

Healthcare associated infections (HCAIs) are an important public health problem. It is essential for medical students, as future healthcare professionals, to have adequate knowledge regarding infection control measures in order to reduce the burden of these illnesses among patients.

Material and methods:

This cross-sectional, questionnaire-based study was conducted among all medical students from 1st to 6th year of the Faculty of Medicine in Belgrade, studies in English. A pre-designed and pre-tested questionnaire was used to collect data from students. Anonymity was maintained. Data were collected and analyzed using SPSS v.20.

Results:

A total of 214 medical students participated in this study. The students were divided into two groups: preclinical (1st to 3rd year of studies) and clinical group (4th to 6th year of studies). The majority (89%) of the students from the clinical part knew the true definition of HCAI. Statistically significant more students from the clinical part had the knowledge about potential reservoirs of HCAIs and modes of transmission (p=0.003). They knew more that hand hygiene included hand washing (62% vs. 48%, p=0.043), alcohol hand rub (71% vs. 44%, p<0.001), and preoperative hand hygiene (60% vs. 20%, p<0.001), and that hand washing with soap and water is the preferred means for preventing Clostridium difficile transmission (60% vs. 31%, p<0.001). However, only 37% of students have heard about "The 5 moments for hand hygiene" defined by WHO.

Conclusion:

The results of this study showed the need and demand for further and continuing education on hand hygiene and infections control measures.

Identifying barriers and enablers to implementing a national antimicrobial stewardship programme in hospitals: the BEAMS project

Kay Currie, Rebecca Laidlaw, Valerie Ness, Paul Flowers

Glasgow Caledonian University, United Kingdom

Introduction:

Davey *et al.* (2017) recent Cochrane review reported that targeted interventions to improve antibiotic prescribing to hospital in-patients are effective in increasing compliance with antibiotic policy and reducing duration of antibiotic treatment, thereby influencing drivers for antimicrobial resistance.

Aims:

This study responds to Davey *et al.*'s conclusion that future research should be directed towards exploring barriers and enablers to the implementation of antimicrobial stewardship (AMS) interventions, in this case, a nation-wide, hospital-based AMS programme across Scotland.

Methods:

Individual telephone interviews with 27 AMS implementation leads (infection specialist consultants, specialist pharmacists and nurses) from all Scottish health regions. Fifteen focus groups with doctors, nurses, clinical pharmacists (n=72) from five purposively selected health regions. Qualitative thematic analysis was applied.

Results:

Six themes were found to be influential in implementation: 'people matter'; 'context, time and resources matter'; 'knowledge, experience and confidence matters'; 'prioritisation matters'; 'technology matters'; and 'feedback matters'. Key barriers and enablers related to these themes were identified and specific recommendations to address these were developed in collaboration with participants.

Conclusion:

Future attention should be directed towards the organisational context and resource requirements for AMS implementation. Developing AMS leadership skills, practitioner confidence, and capitalising on the potential contribution of nurses should be considered. Technological solutions which provide behavioural prompts, in addition to feedback mechanisms to reinforce positive change, would be beneficial. These findings have international relevance for healthcare providers seeking evidence-based recommendations to implement or strengthen AMS in the acute hospital sector, thereby reducing drivers for antimicrobial resistance.

Non-governmental sector as an engine of infection control improvement and tackling healthcare-associated infections

Mariia Dolynska, Katerina Soiak, Yevgenii Grechukha, Andrii Aleksandrin

NGO "Infection Control in Ukraine" (NGO ICU), Kyiv, Ukraine

The NGO "Infection Control in Ukraine" (NGO ICU) focuses on standard operating procedures and education of personnel to prevent the most common healthcare-associated infections (HAI). To date, we implemented the WHO tool-based infection control (IC) assessment practice, developed the national standard on IC in tuberculosis care and online IC course for physicians and nurses. Until recently, the majority of HAI were not registered and overseen in Ukraine. Therefore service providers were not motivated to implement proper IC, and even having been officially approved, IC standards met reluctance. Healthcare reform is in progress in Ukraine. It is related to financial mechanisms and ensuring quality service. NGO ICU took this chance to mitigate HAI risk.

We started the advocacy campaign "InfAction" ("Information in action") aimed to draw attention to HAI, in October 2019. Prominent physicians and medical managers, and the expert in medical law spoke on the infection risk related to everyday medical practice, and its clinical, financial and legal implications. A series of 32 video interviews had 80,000 viewings on Youtube, Facebook, and Instagram as of January 1, 2020.

As a result, interest in HAI prevention has been significantly increased. Our webinars and workshops moved to the top in Ukrainian educational platforms. Large clinics invited us to provide an IC audit. National Health Service included proper IC into the list of requirements for quality service and, starting from July 2020, this will become a prerequisite of service payments for the facilities. Our plans include the pre- and postgraduate IC courses for medical universities launch.

Use of gloves in the emergency department: evaluation and proposal of a simulation-based training program for best practices

Livia Guimarães Andrade, Andrea Gomes Costa Mohallem, Julia Yaeko Kawagoe

Albert Einstein Israelite School of Health Sciences, Sao Paulo, Brazil

Introduction:

Glove use is a central part of standard precautions and the correct usage by healthcare workers (HCW) is challenging, especially in the emergency department (ED) where care takes place in a dynamic.

Objectives:

To observe and analyze the use of gloves by HCW during patient care in an ED; to elaborate a simulation-based training program considering the results of gloves usage; to validate the simulation-based training program with experts and to verify its applicability with a pilot-test.

Methods:

A cross-sectional and methodological study was performed in a public ED in three phases (P) - PI: HCW direct observation during patient care regarding to gloves usage. PII: analysis of gloves usage results and a simulation-based training program development. PIII: training program validation by judges using the Nominal Group Technique and a pilot-test performed to verify its applicability.

Results:

74 HCW performed 89 procedures. From 60 procedures performed with gloves, there was no hand hygiene (HH) before wearing them and only 4.2% of HH compliance after removing them. Gloves were removed with correct technique in 40.8%. They failed to remove or change the gloves when indicated and in 46.7% of cases HCW continued using gloves when leaving the patient area, and 71.4% of them returned with gloved hands.

Conclusions:

There were inadequacies of use of gloves by HCW during patient care in ED. The simulation-based training program developed and validated in this study is a contribution product for HCW training, aiming to the best practices in the use of gloves in ED.

Hepatitis B vaccine uptake among healthcare personnel at Nyeri County Referral Hospital

Pauline Kamau, Monica Kabetu

Nyery County Referral Hospital, Nyery, Kenya

Hepatitis B vaccination uptake has been low among healthcare personnel (HCP) at Nyeri County Referral Hospital (NCRH) despite the occupational hazard associated with the exposure to potentially infectious materials.

The aim was to assess the uptake of Hepatitis B vaccine among the HCP at NCRH.

A retrospective review of medical records of the coverage of Hepatitis B vaccination was done. The hospital Infection Prevention and Control (IPC) committee targeted 300 HCP (56%) who were scheduled to receive 3 doses of Hepatitis B vaccine at 0, 3 and 6 months with the first dose administered in July 2019. Participants were issued with immunization cards and reminded of future vaccination appointments. The coverage was analyzed using Microsoft Excel in form of pie charts and bar graphs.

The initiative was based on complete Hepatitis B vaccine doses available. All the 300 HCP (100%) received the 1st dose of the vaccine while 288 (96%) received the 2nd dose after one month. The defaulters were 2 HCP (0.7%) who got pregnant and 10 (3.3%) did not respond to the reminders for the second dose. Among those vaccinated, 211 (70.3%) and 89 (29.7%) worked in the high-risk and low-risk departments respectively. Nurses 135 (45%) accounted for the majority of HCP who participated in the vaccination.

Uptake of the Hepatitis B vaccine was relatively high especially among health workers in high-risk departments. The use of mobile technology to send out appointment reminders has the potential to improve uptake of vaccination services.

Time to tackle surgical site infections in Romania

Ramona Marincas[1], Alexandru Coman[2]

[1]Satu Mare Emergency Hospital, Romania
[2]Heart Institute "Nicolae Stancioiu" Cluj-Napoca

Introduction/aims:

Healthcare associated infections (HAI) are under-reported in Romania with an overall incidence of less than 0.5%. Official data on this topic show a distorted image with *Clostridium difficile* infections being the most frequent HAI. This proves the lack of reliable data needed for developing infection prevention strategies at the national and local level. Our aim is to describe the practices regarding surgical site infections (SSI) in both public and private hospitals in Romania in order to develop educational programs.

Methods:

This is a descriptive study. We conducted an online survey in 62 hospitals in Romania (approximately 12% of total numbers of hospitals). Data were collected from infection prevention specialists, operating theatres coordinators, head nurses. We followed the One Together recommended structure of the survey with questions related to preoperative, operative and postoperative phase of SSI prevention strategy. Invitations to complete the online survey were sent by email. Data were collected anonymously; the information could not be traced back to the contributors.

Results:

Our results show the SSI practices in Romanian hospitals: preoperative screening - 54% of cases, decolonization - not available for all colonized patients, body hair trimming - 20%, antibiotic prophylaxis - 40% following guidelines, poor infrastructure and equipment - >30% are just a few examples of our results.

Conclusions:

SSI practices in Romanian hospitals are sub-optimal. We will use these data to develop interventions and guidelines in order to increase patients' safety.

Knowledge, attitudes and risk perception about antibiotics usage and resistance among medical students

Vuk Marušić[1], Vladimir Nikolić[1], Olivera Đurić[2], Ljiljana Markovic-Denic[1]

[1]Institute of Epidemiology, Medical Faculty, University of Belgrade, Serbia
[2]Center for Environmental, Nutritional and Genetic Epidemiology (CREAGEN), Section of Public Health, Department of Biomedical, Metabolic and Neural Sciences, University of Modena and Reggio Emilia, Italy

Introduction/aims:

Irrational use of antibiotics is a key reason for the increase and spread of antibiotic resistance. After graduating, medical students are going to prescribe a lot of antimicrobial drugs through their practice. This study aims to investigate the knowledge, attitudes and risk perception towards antibiotics' usage and resistance.

Methods:

This cross-sectional study was conducted among fourth and sixth year medical students of Belgrade University using anonymous questionnaire. It contained data about social and demographic characteristics, knowledge, attitudes and risk perception of antibiotics usage and resistance.

Results:

In total 711 medical students (response rate 70.9%) were enrolled (393 of fourth and 318 of sixth year medical students). Almost all of the students knew that antibiotics are used for treatment of bacterial infections (98.5%) and they knew about antimicrobial resistance (98.9%). Statistically significantly more sixth-year students (96.8%) than fourth-year students (86.3%) thought that abuse of antibiotics is the main cause to bacterial resistance (p<0,001). About 57.9% students thought that antimicrobial drugs are abused in Serbia. Almost half of the students (46.2%) said they knew when to start antimicrobial therapy. A statistically significantly higher percentage of sixth-year students felt that they were mediocre in knowing how to choose the most appropriate antimicrobial drug for an infection than a fourth-year student (p <0.001).

Conclusions:

Clinical years students are not enough educated about antimicrobial resistance and use of antibiotics in treatments, but students want to get more education on this topics. Potential solution is to change curriculum on clinical years of Medical School.

Antimicrobial stewardship programs (ASPs) antibiotic management team: Emergency Center Clinical Center of Serbia

Vesna Mioljevic[1], Goran Stevanovic[2], Ivana Milosevic[2], Snezana Jovanovic[3], Dragana Rajinac[4], Biljana Damjanovic[5], Jelena Vrucinic[5], Marko Ercegovac[6]

[1]Clinical Center of Serbia, Belgrade, Serbia
[2]Infectious Diseases Clinic, Clinical Center of Serbia, Belgrade, Serbia
[3]Department of Microbiology, Clinical Center of Serbia, Belgrade, Serbia
[4]Pharmacology Department, Clinical Center of Serbia, Belgrade, Serbia
[5]Department of Anesthesiology, Clinical Center of Serbia, Belgrade, Serbia
[6]Emergency Center, Clinical Center of Serbia, Belgrade, Serbia

Introduction:

Antimicrobial resistance is increasing; however, antimicrobial drug development is slowing. Antimicrobial stewardship programs (ASPs) is a coordinated program that promotes the appropriate use of antimicrobials (including antibiotics), improves patient outcomes, reduces microbial resistance, and decreases the spread of infections caused by multidrug-resistant organisms. ASPs has been defined as "the optimal selection, dosage, and duration of antimicrobial treatment that results in the best clinical outcome for the treatment or prevention of infection, with minimal toxicity to the patient and minimal impact on subsequent resistance. The CDC, IDSA, & SHEA all recommend that ASPs should be multidisciplinary teams.

Aim:

Describe the results of the ASPs team at the Emergency Center of the Clinical Center of Serbia in the period from 01.04. to 31.12.2019.

Methods:

WHO, CDC, IDSA SHEA methodology for implementation ASPs in hospital.

Results:

The ASPs team at the Emergency Center of Serbia (EC) was formed by decision of the management of the Clinical Center of Serbia and the EC 2015. The team includes infectious disease physician, anaesthesiologist, pharmacist, microbiologist and epidemiologist. ASPs team met once a week, analyzing patients from three EC intensive care units (ICU). At meetings, the ASPs team decides on antibiotic therapy for critically ill patients, following the recommendations on antibiotic therapy and ASPs. Other activities ASPs: daily epidemiological surveillance, the protocol for proper sampling/blood, bronchial aspiration, urine and wounds, lectures on prevention and control of hospital infections (importance of hand hygiene, prevention of CRBSI, PNEU, microbiological sampling). After 6 months we had results: a decrease in DDD doses of colistin from eighty to four hundred and vancomicin with a thousand DDD to four hundred DDD. In same period we had a decrease more than twenty thousand euros on antibiotics. In the same period, the number of hospital-acquired infections caused by Clostridium difficile decreased. In the period from 01.04.2019 to 31.12.2019. the ASPs team met once a week, with a total of 35 meetings analyzing 280 patients from three EC ICU.

Conclusion:

Every hospital should work within its resources to create an effective team. Close collaboration with the staff in the infectious diseases physician, microbiologist, anesthesiologist, pharamacist, hospital epidemiology and administration is essential to a well-functioning program. Engaging hospital leadership will open doors to good relationships with other physician groups.

Keywords: antimicrobial resistance, antimicrobial stewardship programs, ASPs team

Implementation and outcomes of an advanced antimicrobial stewardship program at a quaternary care hospital in the United Arab Emirates

Shafi Mohammed

Cleveland Clinic Abu Dhabi, United Arab Emirates

Purpose:

The implementation of an advanced antimicrobial stewardship program (ASP) at a quaternary care hospital in the United Arab Emirates is described, including a report on the implementation and outcomes of the program.

Methods:

This was a single-center quasi-experimental study to assess the impact of the ASP on Antimicrobial use measures, ASP interventions performed, and clinical outcomes by comparing the data collected at baseline, from the third quarter (Q3) 1 July 2015 to the fourth quarter (Q4) of 31 December 2017, approximately 2 years following program implementation.

Results:

From 1 July 2015 until 31 December 2017, the program reported a total direct cost savings estimated at $1 339 499, despite a significant increase in patient discharges and total patient-days. The antimicrobial cost per inpatient-day decreased by 32% from $47.2 to $32.3.

Usage of monitored antimicrobials decreased despite an increase in patient census since hospital opening. Hospital-onset *Clostridium difficile* infection (CDI) rates decreased from 0.46 cases per 1000 patient days in 2015 to 0.12 cases per 1000 patient days in 2017 (P = 0.035, 95% CI 0.08 to 0.91). Hospital-onset infections due to multidrug-resistant organisms (MDROs) decreased from 2.39 cases per 1000 patient days in 2015 to 0.38 cases per 1000 patient days in 2017 (P = 0.05, 95% CI 0.09 to 0.28). Overall, the

number of ASP interventions amounted to a total of 4123 interventions, with an acceptance rate of 91%.

Conclusion:

The implementation of an advanced ASP at a quaternary care hospital in the United Arab Emirates was associated with a decrease in antimicrobial utilization, antimicrobial expenditure, and a reduction in hospital-onset CDI and MDRO rates. To our knowledge, this is the first report describing the outcomes of an advanced ASP program at a quaternary care hospital utilizing real-time surveillance software and CDSS in the Middle East.

Healthcare waste management at Chulaimbo County Hospital, Kisumu County, Kenya

Duncan Ongayi

Chulaimbo County Hospital, County Government of Kisumu, Kisumu via Nairobi, Kenya

Introduction:

Poor management of healthcare waste (HCW) exposes healthcare workers, patients and the community to infections, toxic effects and injuries. The need for proper HCW management (HCWM) has been gaining recognition in Kisumu West, Chulaimbo County Hospital. We carried out a study to establish HCWM practises and systems in this sub county.

Methods:

This cross-sectional study was carried out in all departments in 15 health facilities (10 public and 2 FBOs and 3 private) from May to June 2019. A standard data collection checklist (adopted from WHO) was employed to collect data on presence of all waste manager; availability of waste bins, job aids and tracking logs; proper waste segregation; method of transport and treatment; qualification of waste to other facilities. Data was keyed in excel speadsheet and analysed for frequencies and proportions.

Results:

Ten of the 15 facilities had a waste manager, tracking logs or waste qualifications. All the facilities had waste bins. Twelve (8%) facilities had job aids while 3 (20%) conducted proper waste segregation. In terms of waste transport, 11 (73%) facilities used hand, 2 (13%) used wheelbarrow while 2 (13%) used trolley for waste treatment, 10 (66%) used open burning, 2 (13%) using burning chambers while twelve (80%) networked only the sharps. 3 (20%) networked all their waste.

Conclusion:

The gaps identified were lack of waste manager, necessary documentation and resources. Most facilities had risky practises such as lack of waste segregation and open burning. More investments should be made in waste management to improve safety and quality of service delivery. In the absence of these at facility level, safe networking of waste to other facilities should be encouraged.

Hand hygiene in emergency medicine field

Małgorzata Timler[1], Ewa Kaniecka[1], Michal Marczak[1], Łukasz Zakonnik[2], Wojciech Timler[1], Monika Białas[1], Dariusz Timler[1]

[1]Medical University of Lodz, Poland
[2]University of Lodz, Poland

Introduction/aims:

Risk of infection in emergency situation seems to be high and effective hand hygiene can reduce pathogen transmission. There are many strategies to improve hand hygiene compliance among emergency medicine staff in Poland. The main aim of our research was to evaluate the knowledge of 'Five Moments of Hand Hygiene' (FMOHH) in emergency medicine staff in Poland.

Methods:

An evaluation survey was conducted to examine knowledge of FMOHH during the 11th Emergency Medicine Conference Copernicus 2018. Responses were obtained from all regions of Poland. Two hundred and thirty-five respondents of 764 participants (128 women (54.5%); mean age, 36.6 ± 12.5 years) were evaluated.

Results:

Knowledge of FMOHH from the WHO Guidelines on Hand Hygiene in Health Care was declared by 74.8% (172 of 230 - women 80.2% vs men 68.3%, p<0.05). Only 21,7% (51 of 235) participants properly listed FMOHH (women 32.0% vs men 9.4%, p<0.001), with 21.3% (50) participants listed it improperly and 57.0% (134) participants did not list it at all. Two or more training courses in 2018 that included FMOHH correlated significantly with correct answer (p<0,001) in comparison to one or non-training course (43.1% vs 14.3% vs 16.9%).

Conclusions:

The lack of knowledge of FMOHH in emergency medicine staff in Poland is concerning. The courses including five moments of hand hygiene should be implemented more often.

Keywords: hand hygiene, safety, emergency medicine

Compliance with the international guidelines on antibiotic prophylaxis for major elective abdominal surgery at a tertiary hospital in Serbia before institution of national recommendations

Jelena Veličković[1], Vesna Mioljević[2], Stevana Vukašinović[3], Ivan Palibrk[1], Slavenko Ostojić[1], Velimir Marković[1]

[1]Clinical Center of Serbia, Hospital for Digestive Surgery, Belgrade, Serbia
[2]Clinical Center of Serbia, Epidemiology Department, Belgrade, Serbia
[3]Clinical Center of Serbia, Belgrade, Serbia

Introduction/aims:

Surgical antibiotic prophylaxis (SAP) is the evidence-based method to prevent surgical site infections. The aim of our study was to assess the compliance with the international guidelines for SAP in patients undergoing major abdominal surgery in a teaching hospital in Serbia during a period prior to publication of the national guidelines for rational antibiotic use.

Methods:

An observational study was conducted at the hospital for digestive surgery, Clinical Center of Serbia, from January to March 2019. All consecutive patients scheduled for elective major surgery were included and data regarding the use of SAP (indication, choice of drug, timing of the first dose, intraoperative re-dosing, duration of SAP) were collected. The compliance rate was calculated for each criterion. We also investigated the pattern of SAP on the occurrence of infections.

Results:

The study included 267 patients from 10 hospital wards, and the antibiotic was administered in 266 (99.6%) cases. The choice of antibiotic conformed with the guidelines in 23.9%, route in 100%, timing in 15.7%, re-dosing when needed in 29.2%, and the duration in 13.1%. Total compliance with the recommendations was achieved in 12% of the cases. Median duration of SAP was 4 [2-6] days, with variation across surgical wards (p<0.001). Longer duration of SAP was associated with postoperative use of other antibiotics (p<0.001) for treatment of infections (35;13.1%).

Conclusions:

SAP prescription is sub-optimal at our hospital. Initiatives at the institutional level to increase awareness of the surgical team are mandatory and may enable full adoption of the newest national recommendations.

Control of a *K. pneumoniae* OXA-48 carbapenemase producer outbreak on an ICU through intensive manual cleaning with peracetic acid wipes

Deborah Xuereb, Michael A. Borg

Mater Dei Hospital, B'Kara, Malta

In our adult 20-bedded general ICU we screen all patients on admission and routinely for CPE rectal carriage due to endemicity. Following identification of CPE Kp OXA-48 acquisition in a bariatric patient, we

agreed to not isolate the patient due to limitations of movement space within isolation room which would have hindered patient mobilization. Patient was thus zoned off in the 4-bedded bay using screens, whilst contact precautions were enforced. In the following weeks several patients on ICU acquired carriage or infection with *Klebsiella pneumoniae* (Kp) OXA-48, including two renal transplant patients. Despite several interventions to control spread, including changing of all pillows, checking of all mattresses for leaks and more emphasis on hand hygiene, evidence of cross transmission was still present. The outbreak also coincided with a period of low ICU nurse to patient ratios. A total of 11 patients acquired Kp OXA-48 over a period of 5 weeks. The outbreak was eventually controlled by a 10 day period of intensive, deep manual cleaning of all ICU using peracetic acid wipes, under direct supervision of Infection Control Team. Cleaning included disinfection of all furniture, medical equipment and storage areas and was also accompanied by a decluttering exercise and hydrogen peroxide fumigation of most of the ICU. Several gaps in cleaning processes were identified mainly around methods and responsibility of cleaning of medical equipment. Following this intervention there were no recorded CPE Kp OXA-48 acquisitions in ICU patients for a total of 68 days.

Poster Presentations

Analysis of the knowledge of operating nurses on the prevention of surgical site infection

Maria Belcarz

Medical University of Łódź, Poland

Introduction:

Infection control is one of the challenges of modern medicine and related sciences. Active prevention and reduction of the risk of surgical site infections are a very strategic element.

This supervision is particularly important in surgery departments and the operating theater. In hospitals, multi-specialist activities in the field of infection prevention are undertaken. However, use of practical knowledge and experience by medical staff in everyday practice brings the best results.

Aim:

To assess the level of knowledge of operating nurses regarding the prevention of surgical site infection.

Method:

In research used the diagnostic survey method, using a questionnaire. A group of 50 nurses aged 27 to 55 years employed in the operating theater was examined. The research was anonymous and voluntary, using the author's own questionnaire, containing 20 single-choice closed questions.

Results:

Operating nurses with master degree have higher level of knowledge about prevention of surgical site infection.

On the level of knowledge did not impact the length of seniority in the profession.

Conclusion:

1. Nurses' knowledge about the prevention of surgical site infections are varies and depends on the level of their education.
2. Due to the insufficient knowledge of nurses regarding the prevention of surgical site infections, there is an immediate need to use educational activities in this area.

Ventilator-associated pneumonia: incidence and risk factors in six intensive care units in Tunisia

Asma Ben Cheikh, Sana Bhiri, Nouha Ketata, Amel Gara, Selwa Khefacha, Houyem Said Latiri, Mohamed Ben Rejeb

University Hospital of Sahloul, Faculty of Medicine of Sousse, University of Sousse, Tunisia

Introduction/aim:

Ventilator-associated pneumonia (VAP) continues to cause significant morbidity, mortality, and hospital costs, especially in the intensive care unit (ICU). This study aimed to determine incidence and factors associated with VAP in six ICUs of the University Hospital-Sahloul (Sousse, Tunisia) in 2018.

Methods:

We conducted a prospective observational cohort study over a three months period in six ICUs of the University Hospital-Sahloul (Sousse, Tunisia) in 2018. All patients hospitalized with mechanical ventilation (MV) for more than 48 hours in the ICUs

were included. Logistic regression with the stepwise method of Hosmer and Lemeshow was used to identify factors associated with VAP.

Results:

Overall, 110 patients were enrolled. The mean age of patients was 44 ± 25 years. Of them, 66.4% were male. The median duration of MV was 5 days [2-16]. The incidence of VAP was 32% and the density incidence was 33/1000 ventilator days. The most common organism were *Pseudomonas aeruginosa* (n=14). Of them, 12 were ceftazidime-resistant and three were resistant to imipenem. Independent risk factors associated with VAP in ICU were history of antibiotic therapy during last 6 months (p=0.007), tracheotomy (p<0.001) and reintubation (p<0.001).

Conclusion:

VAP rates in our ICUs were very high. Antimicrobial stewardship programs involving pharmacists and physicians must be elaborated to optimize the antibiotic prescribing. Mechanical ventilation require more-effective intervention control in our hospital.

Colonization and hospital acquired infections by multidrug-resistant organisms in intensive care unit

Jelena Đekić Malbaša, Zlatko Ćirić

Institute for Pulmonary Diseases of Vojvodina, Novi Sad, Serbia

Introduction:

The aim of study was to determine the prevalence of colonization by multidrug- resistant organisms (MDRO) at ICU admission and risk factors for colonization and infection.

Methods:

A retrospective study was conducted in ICU of Institute for Pulmonary Diseases of Vojvodina from January to December 2019. All adult ICU patients who were screened at ICU admission for nasal and intestinal carriage were included. Patients admitted with any infection caused by MDRO were excluded.

Results:

A total of 136 patients were eligible for inclusion in the study. Among them, 68 (50%) were colonized at admission. Among 136 included patients (1124 patient-days), 48 (26.6%), 21 (11.6%), 4 (2.2%) and 2 (1.1%) were colonized by *Acinetobacter* spp., Enterobacteriacae, MRSA and VRE, respectively. Among observed risk factors for colonization at admission, prior hospitalization (60.3% vs. 42.6%, p=0.039) and prior use of antibiotics (58.8% vs. 42.0%, p=0.049) were more often registered in colonized compared to non-colonized ICU patients. Patients colonized at admission had longer total ICU stay (10.8±9.18 vs. 6.6±5.06, p=0.009), more often use of bronchoscopy (32.4% vs. 14.7%, p=0.015), and had more HAI by MDRO (27.9% vs. 13.2%, p=0.031) compared to non-colonized.

Conclusion:

High prevalence of MDRO colonization at admission were observed, and MDR Acinetobacter spp. were the predominant bacteria. Identification of risk factors for MDRO colonization and screening at admission and during the hospitalization is also important in prophylaxis of MDRO colonization/infection and restriction of the use of broad spectrum antibiotics.

Keywords: colonization, MDRO, HAI, risk factors

Results of 15-year surveillance on infections associated with medical devices and healthcare in a tertiary care hospital in Serbia

Gorana Dragovac[1], Smiljana Rajčević[1], Anita Jovetić[2], Marija Živanović Milenković[2]

[1]Institute of Public Health of Vojvodina and University of Novi Sad, Medical Faculty, Department for Epidemiology, Serbia

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

Aim:

To describe infections and pathogens among patients in intensive care unit (ICU), as a result of 15-year

surveillance on infections associated with medical devices and healthcare in one hospital in Serbia.

Method:
A prospective cohort study in medical-surgical ICU of the tertiary-care university hospital in a period 2004-2018.

Results:
8881 patients out of 9882 were included in the survey according to the criteria that were hospitalised at least 48 hours after admission in ICU. The average age was 57.1 years (ranged from 18 to 92), and male-female sex ratio was 1.7:1. The average length of stay in ICU was 5.3 days. Patients with HAI stayed in a hospital for 6.5 days longer than patients without HAI. The total of 2743 HAI were registered with the mean incidence rate of 30.8% and incidence density of 33.4 per 1000 ICU patient-days. Annual incidence of HAI had decreasing trend with the highest incidence density in 2005 (64.2/1000 ICU patient-days) and the lowest in 2012 and 2017 (22.5 and 24.6 per 1000 ICU patient-days, respectively). There was the highest risk for pneumonia (13.7/1000 ventilator-days), CVC bloodstream infections (9.9/1000 CVC-days) and urinary tract infections (8.7/1000 catheter-days). The microbiological agents responsible for the most typical device-related infections were very highly resistant to the recommended antimicrobials.

Conclusion:
Infection control programmes in hospitals in high risk units such as ICU should be implemented as the part of the global strategy to surveillance and to prevent the emergence and spread of antimicrobial resistance.

Showcase of the frequency and causes of blood infection connected to intravascular catheters in the Clinical Center of University Sarajevo

El-Jesah Džulić, Azra Čamdžić, Amela Dedeić-Ljubović

OU Clinical microbiology, Clinical Center of University, Sarajevo, Bosnia and Herzegovina

Introduction:
Modern approach of treatment and care of patients, especially critical diseased, cannot be implemented without invasive forms of treatment that also includes central vein approach.

Central vein catheters (CVC) simultaneously make care easier for medical staff but increase the risk of bacteremia and septicaemia with hospitalized patients.

Aims:
To show the most usual causes of blood infection connected to CVC on the Clinical Center of University Sarajevo.

Material and methods:
Between 01/01 and 31/12/2019 a total of 262 patients were tested whose samples of peripheral blood and top of CVC were delivered to OU Clinical Microbiology of the CCUS. The samples of CVC were processed through quantitative and qualitative methods (direct seeding on nutritive media bases and liquid medium). Detection of microorganisms out of peripheral blood was performed with an automated system for detecting bacteria and fungi in blood-BACTEC, BD, and identification and testing of sensibility to antibiotics in the VITEK 2 Compact system, Biomerieux.

A comparation of blood samples and tip of CVC analysis results has been performed.

Results:
Out of a total of 262 CVC samples tested, 40 samples were CVC positive (15,3%). In those samples, 48 causes were discovered.

E. coli 11 (23%), *Acinetobacter baumannii* and *E. faecalis* are 7 each (14,6%), *Klebsiella pneumoniae* 6 (12,5%), *Pseudomonas aeruginosa* 5 (10,4%), *Enterobacter cloace* 4 (8,3%), others (*Proteus mirabilis*, *Serratia marcescens* and *Staph. aureus*) in 8 samples (16,6%). Same type and resistotype of isolates in chemoculture samples was discovered in 6 patients (15%). *E. coli* i *Acinetobacter baumannii* are

isolated in 2 patients, and MSSA and *Pseudomonas aeruginosa* in 1 patient.

Conclusion:

The study has showed that 15% blood infections were affiliated with CVC. Bacteremia affiliated with CVC lead to morbidity and mortality rates rising and treatment costs rising. It is necessary to implement different measures, programs and educations in the purpose of their reduction.

Incidence and microbiological profile of healthcare-associated infections in a Tunisian intensive care unit

Olfa Ezzi, Asma Ammar, Yosr Ayedi, Mansour Njah, Mohamed Mahjoub

Farhat Hached University Hospital, Sousse, Tunisia

Introduction/aims:

Healthcare-associated infections (HAIs) occurring in patients treated in an intensive care unit (ICU) are serious complications in the treatment process. Their impact implies prolonged hospital stay, long-term disability, increased resistance of microorganisms to antimicrobials, a massive additional financial burden for health systems, high costs for patients and their families, and excess deaths. The aim of the study was to determine the incidence and microbiological profile of healthcare-associated infections in a Tunisian surgical intensive care unit.

Methods:

An active surveillance method was used to detect HAIs in adult patients who spent over 48 hrs in a surgical ICU ward located in Central Eastern Tunisia from january to September 2019.

Results:

During the study period 81 patients were treated in the ICU, for more than 48 h each. Sex-ratio was 2.11. Mean age was 50.34 years (SD=20). Median length of stay was 4 days (IQR=2-9).

A HAIs incidence rate of 18.5 per 100 admissions and incidence of 31.9 per 1,000 patient days was observed. Among 20 HAIs reported, pathogens could be identified for 9 HAI cases (45%).

The main types of HAI detected in ICU patients included the following: pneumonia (60%), central line associated infections (CLAI) (10%) and urinary infection (10%).

Acinetobacter baumannii was the most common organism isolated (66%) followed by *Pseudomonas aeruginosa* (20%).

Conclusion:

In Tunisia, infection control programmes are a challenge for the future, and their implementation requires increasing the awareness of both medical staff and hospital management.

Prevalence and risk factors of healthcare-associated infections in a Tunisian university hospital

Olfa Ezzi, Asma Ammar, Yosr Ayedi, Nihel Omri, Mansour Njah, Mohamed Mahjoub

Farhat Hached University Hospital, Sousse, Tunisia

Introduction/aim:

Point-prevalence studies can identify priorities for infection control. We conducted a prevalence survey in University Hospital of Sousse, Tunisia, in order to determine prevalence of HAI and identify its risk factors in Farhat Hached University Hospital.

Methods:

We performed a one-day prevalence survey of HAI at the Farhat Hached University Hospital between November 11th and November 20th, 2019. All patients who had been present in the same ward for at least 48 h were included. Trained medical members investigated all the patients hospitalized for at least 48 hours with a single passage by ward. Centers for Disease Control and Prevention definitions of infections were followed.

Results:

This survey included 373 patients with a sex ratio of 0.85. The median patient age was 39 years old (interquartile range=12 to 59). The median length of stay pre-survey was 7 days (interquartile range=4 to 15 days). The prevalence of patients with at least one HAI in our hospital was 19.9%; with a prevalence rate of HAI equal to 21.2%. The most common HAI infections were peripheral venous catheter infections (36.7%), clinical sepsis (15.2%) and surgical site infections (12.6%).

Multivariate analysis showed that male gender, neutropenia, exposure to peripheral and central venous catheter and artificial ventilation were significantly associated with an increased risk of HAI.

Conclusion:

In areas with limited personnel and resources, regular investigation of the point prevalence of HAIs can be performed in lieu of comprehensive monitoring to elucidate risk factors and disease burdens of HAIs.

A journey to chase CAUTI reduction: a multidimensional approach

Ma Leni Garcia[1], Cherlyn Simbulan-Martinez[1], Emad Al Omari[1], Ian Stewart Mcdonald[1], Mawahib El Hassan[2], Kristine Icay[1], Anie Mathew[1], Ann Kartine Cunano[1], Shiny Shiju[1], Mincy Shaji[1], Asma Abas[1], Fadia Ali1, Emad Ibrahim[2]

[1]Hamad Medical Corporation Heart Hospital, Doha, Qatar

[2]Hamad Medical Corporation, Doha, Qatar

Introduction/aim:

Catheter-associated urinary tract infections (CAUTI) are the most predominant healthcare-associated infections, remained a challenge for several years in Heart Hospital despite the implementation of preventive measures. In 2015-2018, there were 17 insertion-related and 35 maintenance-related infections and high standardized infection ratios (SIR) above the NHSN SIR (0.993). We aim to reduce CAUTI rates below NHSN benchmark at the end of December 2019 and beyond by implementing a multidimensional approach to prevent harm, reduce hospital stay and healthcare costs.

Interventions:

We conducted a comprehensive analysis of predisposing risk factors of patients and a literature review of evidence-based practices and organized CAUTI reduction project and CAUTI taskforce team. We implemented a multidimensional approach to change the system, HOUDINI protocol to decrease catheter usage, staff education and training of new evidence-based practices, organized physician CAUTI champions, enhance patient and family education, continuous monitoring, and feedback, use of reminders and communication to culture change to reduce CAUTI.

Results:

CAUTI SIR from 2015 to 2018 gradually decreased; and in 2019, a significant reduction to 0.764 below the NHSN national SIR (0.993) and median (0.872). A remarkable reduction to 50% in the number of infections (6 CAUTIs) in 2019 compared to 2018 (12 CAUTIs); a 46.5% reduction in CAUTI rates.

Conclusion:

The strict implementation of a multidimensional approach, system change, nurse-led protocol, education, and training; proactive approach of CAUTI taskforce teams, teamwork, commitment, strong leadership support, continuous monitoring and feedback, communication and reminders to change culture contributed to CAUTI reduction.

Preventing and reducing percutaneous injuries among healthcare workers: is it achievable?

Ma Leni Garcia[1], Cherlyn Simbulan[1], Emad Al Omari[1], Ian Stewart Mcdonald[2], Fadia Ali[1], Emad Ibrahim[2]

[1]Hamad Medical Corporation Heart Hospital, Doha, Qatar

[2]Hamad Medical Corporation, Doha, Qatar

Introduction/aim:

The frequent use of needles and sharps poses a potential risk of blood and body fluid exposures (BBFE) particularly the percutaneous injuries among healthcare workers. The increased incidence of BBFE to 109% in the first semi-annual 2018 (12 cases) to 182% (20 cases) compared to 11 cases in 2017 and 90% of exposures (18 cases) accounted for needles and sharp instruments/sharps were alarming to the infection control team. We aimed to reduce the percutaneous injuries to 50% at the end of December 2019 by implementing preventive measures to reduce percutaneous injuries.

Interventions:

We conducted a comprehensive analysis of all exposures, developed action plans, and interventions to prevent further occurrence. We implemented a multidimensional approach to a system change focusing on physical structures and adequate supplies of wall-mounted punctured resistant containers, use of safety-engineered devices, education/re-education and training of newly hired and old nurses about safety devices, procurement of safety insulin syringes, BBF alert and awareness campaign to prevent exposures.

Results:

In 2019, a significant 70% reduction in the incidence of BBFE and a 67% decrease in percutaneous injuries after strict implementation of preventive measures in reducing percutaneous exposures.

Conclusions:

The implementation of multidimensional approach such as availability of physical structures, use of safety-engineered devices, education/re-education and training of newly hired nurses and old nurses, adequate supplies, continuous monitoring and feedback, reminder and communication about safe working environment and practices, strong leadership support to culture change can significantly reduce percutaneous injuries among healthcare workers.

Our experiences by a new inpatient risk assessment protocol

Kinga Gáspár, Márta Patyi

Bács-Kiskun County Hospital, Kiskunfélegyháza, Hungary

In Hungary, a new methodological letter was published in January 2019. The title of this letter is “The confirmation on prevention and supervision of the hospital-acquired infections by institutional and individual risk assessment”. A new institutional protocol was formed in our hospital (Bács-Kiskun County Hospital) after the appearance of this risk assessment methodological letter. This was introduced since February 2019 at our all three institutional sites (Kecskemét, Kalocsa, Kiskunfélegyháza). The protocol prescribed three screenings, a nasal and throat swab for the detection of MRSA and a rectal swab for the detection of ESBL colonization at every patient with high risk for infection of multidrug-resistant (MDR) pathogens.

The number of the received samples for microbiological cultures was significantly higher than the previously estimated number of tests. Therefore the protocol after 10 days was temporarily suspended because of individual and material conditions.

In March we introduced a new, modified protocol. We narrowed the group of high risk patients by a new template and at the same time we broadened the range of the screened multi resistant pathogens. The samples collected were much more manageable, on the perspective of the individual and material conditions.

The filling of the risk assessment papers is monitored since the introduction of the protocol at Kiskunfélegyháza Urban Hospital.

By this presentation we would like to describe our experiences during the introduction, the modification and the compliance assessment of this new protocol.

Healthcare associated infections and mortality in a University Hospital in Tunisia

Hajer Hannachi, Asma Ben Cheikh, Nedia Jaidane, Sana Bhiri, Mohamed Ben Rejeb, Houyem Said Laatiri

Department of Prevention and Security of Care, University of Medecine of Sousse, Tunisia

Background:

Healthcare associated infection is a real public health problem because of its high frequency, severity and excessive cost. It has become a leading cause of death especially in intensive care units.

Aim:

To estimate incidence and associated factors of healthcare associated infections and mortality in a University Hospital of Tunisia.

Methods:

This was a cohort study conducted in all the intensive care units (ICUs) in a University Hospital during three months (from September to November 2019). Data was provided from patients' files. Data entry and analysis was done using SPSS version 22. Multivariate analysis was used in order to identify independent risk factors for healthcare associated infection and mortality.

Results:

A total of 202 patients were enrolled in this study. The incidence rate of healthcare-associated infections was 53,96% (109/202). The ratio infection/infected was estimated to 1.65 (109/66). The incidence of multi-drug resistant pathogens was 2.28% (43/202). Mortality was found in 19.3% of cases (n=39).

The multivariate analysis showed that long duration of central line catheterisation (RR= 7.44; 95%CI 2.79-19.82), tracheotomy (RR=8.61; 95%CI 2.09-35.39) and length of stay (RR=1.08; 95%CI 1.04-1.13) were found as independent risk factors for healthcare–associated infection. Healthcare associated infections (RR=3.42; 95%CI 1.72-18.29) and the identification of multi drug resistant bacteria (RR=5.62; 95%CI 2.99-25.33) were found as independent risk factors for mortality.

Conclusion:

The incidence of HAIs in our hospital is relatively high and was identified as an independent risk factor for mortality. Effective measures have to be taken in order prevent transmission of HAIs and mutidrug resistant bacteria.

Investigation and control of multi-drug resistant *Pseudomonas aeruginosa* outbreak in a surgical intensive care unit

Hajer Hannachi, Asma Ben Cheikh, Sana Bhiri, Salwa Khefacha, Walid Naija, Houyem Said Laatiri, Mohamed Ben Rejeb

Sahloul University Hospital, Sousse, Tunisia

Introduction:

The emergence of multiple-drug resistance among strains of *Pseudomonas aeruginosa* appeared as a further public health concern mainly in the intensive care unit (ICU). We describe a multi-drug resistant *Pseudomonas aeruginosa* (MRPA) outbreak and its management in a Tunisian surgical ICU.

Methods:

The surgical intensive care unit has a capacity of 12 beds in a university hospital. The department of prevention and security of care is engaged in ongoing surveillance of healthcare-associated infections. The outbreak occurred from June to August 2018. Positive patients with MRPA were included in our study. Preventive and control measures were implemented.

Results:

In this outbreak, 8 patients were involved. MRPA was responsible for different localizations of healthcare-associated infections. Similar antibiotic-resistant profiles showed that they were extensively drug-resistant bacteria. No case of death was mentioned. AS we dressed the epidemic curve and the synoptic table, we identified the index patient. Control measures implemented to stop the spread of the infection involved establishment of prevention

guidelines, hand-hygiene promotion, isolation of patients colonized or infected by such organisms, terminal cleaning of isolation rooms and extensive disinfection of all potentially contaminated sites, including floor, bed rails, tables, water taps, and sinks daily with 75% alcohol and sodium hypochlorite. No more cases were observed until October 2018.

Conclusion:

A surveillance program of healthcare-associated infections is important and helps in the implementation of effective measures in order to prevent the transmission of an outbreak.

Bacteriological and therapeutic profile of healthcare-associated infections in a Tunisian university hospital 2015-2019

Hajer Hannachi, Dhekra Chebhil, Souhir Chelly, Latifa Merzougui

University Hospital, Kairouan, Tunisia

Aim:

To describe the bacteriological and the therapeutic profile of healthcare-associated infections (HAIs) during cross-sectional studies conducted during five years from 2015 to 2019 in a Tunisian university hospital.

Methods:

As part of the HAIs control and prevention program in our hospital, our team performed an annual prevalence survey through a cross-sectional study. We have included all the hospital wards in the investigation, except those of emergencies and haemodialysis. Data collection was made by using national prevalence survey for HAIs's form.

Results:

In 2015, the bacteriological profile was identified in 60% of HAIs cases. A total of 25 bacteria were found. The bacterial pathogens isolated were predominantly *Pseudomonas aeruginosa* (44%), followed by *E. coli* (20%). In 2016, 72% of HAIs were positive for bacterial growth. The most common pathogens were gram-negative bacilli (GNB). Besides, third-generation cephalosporin was the most prescribed antibiotic. In 2017, *Klebsiella pneumoniae* accounted 40% of all identified bacteria and almost the majority of patients were treated by imipenem. In 2018, out of total 30 samples 18 (60%) yielded bacterial growth. *E. coli* (50.4%) was the commonest organism followed by *Acinetobacter baumannii* (20.3%). In 2019, 24 microorganisms were isolated, *Pseudomonas aeruginosa* (38.8%) and *E. coli* (27.8%) were predominantly identified. Third-generation cephalosporin and amoxicillin-clavulanic acid were prescribed in 65%.

Conclusion:

Our study showed the main pathogens identified and the chemotherapy prescribed in over the past five years. This survey may contribute to reduce HAIs by adhering to recommended infection control measures and rules of antibiotic prescription.

Central sterilization at the Health Center Bijeljina

Ruzica Jelisic, Dusko Milovanovic, Igor Novakovic, Ankica Stajic Vujic

Health Center Bijeljina, Bosnia and Herzegovina

Introduction:

Within healthcare systems of less developed countries, such as Republic of Srpska, Bosnia and Herzegovina, there is a lack of directives and guidelines within the area of infectious disease control. This especially applies to primary level institutions which are therefore required to develop and conduct measures of prevention and elimination of intrahospital infections independently.

A major movement in this area has been made through the application of certification standards, what is a legal obligation, although they are still not consistently applied in all healthcare institutions

Objectives:

Our goal is to understand the importance of establishing central sterilization in primary health institutions.

Methods:
Retrospective analysis has been made for sterilization control as an analyse of whole sterilization system in HC Bijeljina.

Results:
In 2019, a central sterilization unit, which include a pass-through autoclave with a capacity of 250 l, started operating. For the needs of dentistry, a plasma sterilizer with a capacity of 50 l was purchased.

Based on the test results analysis we concluded that implementing central sterilization, with the use of autoclaves, is necessary to enable more efficient and effective sterilization process.

Conclusions:
Health Center Bijeljina is the first primary care facility in the Republika of Srpska to establish central sterilization and use a plasma sterilizer to sterilize endodontic and other dental instruments.

The implementation of central sterilization also allows more reliable sterilization monitoring as well as considerable resource savings.

Keywords: sterilization, sterilization control, steam sterilization control, intrahospital infections

Virulence factors in three species of enterococci causing invasive infections

Milica Jovanovic[1], Tanja Tosic[1], Snezana Jovanovic[1], Gina Maki[2], Vesna Mioljevic[1], Branko Velebit[3], Goran Stevanovic[1], Rajica Stosovic[1], Marcus Zervos[2]

[1]Clinical Center of Serbia, Belgrade, Serbia
[2]Henry Ford Health System, Detroit, USA
[3]Institute of Meat Hygiene and Technology, Belgrade, Serbia

Introduction:
We evaluated the characteristics of three species of enterococci causing invasive infections, namely endocarditis and sepsis.

Methods:
Only the cases of invasive infections caused by enterococci isolated in repeated blood samples, and confirmed by clinical diagnoses of sepsis or endocarditis, were included in this study.

Results:
Isolates included fourteen *Enterococcus faecalis*, two *Enterococcus faecium* and one *Enterococcus durans*. Overall mortality rate was 35%. All strains were vancomycin-sensitive. None of investigated pathogenicity factor genes (esp, ace, asa 1, gel E, hyl, cyl A and cyl B, efaAFs, efaAFm) could be ascribed to a specific disease. All *E. faecalis* were biofilm producers, as well as one isolate each of *E. faecium* and *E. durans*. Cases of endocarditis (n=7) were caused by 3 species of enterococci and all of them were biofilm producers. Neither gelE, esp, nor any other gene could be connected significantly to biofilm formation ($p>0.05$).

Conclusion:
Capability of biofilm production in causative agents of endocarditis confirms the importance of these properties in pathogenesis of this infection. It is likely that various virulence determinants of *E. faecalis* played redundant roles in biofilm formation, or that other factors influence that process in *E. durans*.

Surveillance system of HAI in South Bačka District, Serbia - feedback and reports

Anita Jovetic, Marija Živanović Milenković, Gorana Dragovac

Institute of Public Health of Vojvodina, Novi Sad, Serbia

Introduction:
The WHO has developed the Global Infection Prevention and Control Priorities 2017-2021 manual, which describes eight essential components.

Aim:
To describe the implementation of WHO's priorities manual in South Bačka District, Serbia.

Results:

In Serbia first two components are responsibility of Ministry of Health (national infection control program, national guidelines, dedicated budget) while components 3-8 (surveillance, training, implementation of guidelines, monitoring) are responsibility of healthcare facilities. Institute of Public Health of Vojvodina with its department for infection control (IC) is involved in HAI surveillance and timely feedback in South Bačka district. HAI reporting is mandatory in Serbia. surveillance system is comprehensive. Any HAI registered applying ECDC definitions at any department of any hospital in the district is to be reported on official paper case report form (pCRF) and sent to Institute of Public Health of Vojvodina. There, every pCRF is checked for missing data and when evaluated and completed variables are entered into the electronic data base. Feedback of results (incidence rates by type of HAI and by department) is performed timely and quarterly at facility level, and annually at national level.

Conclusion:

The results of comprehensive surveillance of HAI show improvement in registration at some departments and subregistration at others. In the case of limitation of trained staff, it is advisable to apply targeted surveillance.

Challenges for Polish epidemiology: *Clostridium difficile* infection

Zofia Kiersnowska, Ewelina Lemiech-Mirowska

Medical University in Lodz, Project InterDoktorMen

Introduction:

In recent years, microbial drug resistance has been increasing rapidly, posing many clinical and epidemiological challenges as well as socioeconomic and political challenges. The above situation causes that the patient's safety is at risk, because they are increasingly exposed to ineffective therapy and additional antibiotic side effects and increased mortality due to infections. A particularly dangerous phenomenon is the large spread of antibiotic-resistant *Clostridium difficile*, including strain PCR027. In Poland, the rules for recording healthcare associated infections are regulated by the Regulation of the Minister of Health of December 23, 2011.

Methods:

The research was based on the reports on cases of infectious diseases and poisonings in Poland National Institute of Public Health, based on data from divisions of Voivodeship Sanitary and Epidemiological Stations and materials of the Center for Digestive Diseases and available literature.

Results:

In Poland, the number of *Clostridium difficile infection* cases in 2018 was 11,592 (compared to 4,728 in 2013). In 2018, toxin-forming *Clostridium difficile* strains were responsible for 41.52% of reported epidemiological outbreaks. Randomized studies have shown a 54% greater efficacy in the FMT method compared to vancomycin treatment.

Conclusions:

Infections caused by *Clostridium difficile* are becoming an increasingly serious problem for health care units. They have a significant impact on the prolonged hospitalization of patients, thus causing the increase in financial expenses incurred by hospitals. The main predisposing factors for the occurrence of CDI include old age and antibiotic therapy. Minimizing the scale of nosocomial infections requires effective risk management.

The spread of PCR 027 strain increases the incidence of CDI relapses and the difficulties in the treatment process. The FMT method, due to high safety, can be used in elderly patients and those suffering from comorbidities. The FMT method should be used for infections caused by *C. difficile* strains which have shown low efficacy of metronidazole and/or vancomycin treatment.

Keywords: *Clostridioides difficile Infection* (CDI), infection control, drug-resistant pathogens

Epidemiological situation in the Polish healthcare units

Ewelina Lemiech-Mirowska, Zofia Kiersnowska

Medical University of Lodz

Introduction:

Increasing drug resistance is one of the main epidemiological problems in the hospital care system. A particularly dangerous phenomenon is the spread of Carbapenemase-Producing Enterobacteriaceae, and among them the population of *Klebsiella pneumoniae* NDM-1. In Poland the rules for register of HAIs are regulated by the Ordinance of the Minister of Health of 23th December, 2011. It is assumed that in Polish hospitals, infections associated with the provision of healthcare services reach 400,000. cases per year which gives 5% of all patients.

Methods:

The research was based on reports of Supreme Audit Office and National Reference Center for Antimicrobial Susceptibility, data from divisions of Voivodeship Sanitary and available literature.

Results:

In 2016, compared to 2015, there was an increase in the number of patients infected with drug-resistant New Delhi strains by 278.7%, and there was also a 13% increase in the number of patients diagnosed with sepsis. In 2017, only 110 microbiologists and 219 epidemiologists were professionally active in Poland. The average number of microbiological tests per year per bed was 24.5 - twice less than the average in EU.

Conclusions:

The findings indicate the need to introduce systemic solutions aimed at improving the epidemiological situation in the prevention and control of nosocomial infections. Among the most important measures requiring correction are the increase in financial expenditure on health care, provision of more medical personnel, increase in the number of microbiological tests ordered and accurate infection control.

Hygiene practices relating to prevention of blood-exposing accidents' occurrence among internal trainees in a university hospital

Mohamed Mahjoub, Olfa Ezzi, Asma Ammar, Wadiaa Bannour, Radhia Hellali, Mansour Njah

University Hospital Center Farhat Hached, Sousse, Tunisia

Introduction:

Blood-exposing accidents (BEA) are one of the leading causes of occupational accidents in health institutions. BEA surveillance is considered as one of the pillars of risk management strategies in healthcare settings. Interns represent a risk group, due to their lack of experience, and inadequacies of training and information related to BEA.

Objective:

To establish an overview of BEA with internal medical trainees practice, in order to improve their practical management.

Methods:

We conducted a descriptive cross-sectional observational study during two months in 2018 with all interns practicing in medical and surgical departments of a universal hospital center at a Tunisian city, using a pre-established, pre-tested and self-administered questionnaire.

Results:

The response rate was 80% (176/220). An updated vaccination status is reported by interviewees in 70.5% of the cases. Main factors predisposing to a BEA are related to: type of care (92.6%), duration of the care act (69.6%) and lack of professional experience (63.6%). Among interviewed interns, 67,5% knew standard hygiene precautions. Mechanisms of BEA were mainly related to bites (90.09%). Serological status of patient source was reported by 59.4% of respondents. Absence of a protocol specifying action to be taken was reported as a brake on the BEA declaration of in 22% cases.

Conclusion:

Improvement of BEA management system should be based on development of training and awareness-raising, in order to improve perception of risks related to BEA, but also the practical behavior in case of occurrence of this incident.

Prevention of infectious risk through observance of good hygiene practice among liberal physicians

Mohamed Mahjoub, Olfa Ezzi, Asma Ammar, Hassene Achache, Wadiaa Bannour, Radhia Hellai, Mansour Njah

University Hospital Center Farhat Hached, Sousse, Tunisia

Introduction:

Outside health establishments, liberal medical practice, may supply healthcare associated infections (HAI). The degree of application of good hygiene practice (GHP) depends on doctors' perception and training (academic and continuous).

Objectives:

Estimate HAI by specifying degree application of GHP's among physicians at their medical offices in the second largest Tunisian town.

Methods:

A descriptive cross-sectional study was realized from January to April 2018 using a self-administered and pre-tested questionnaire to all general physicians in private practice at a Tunisian city.

Results:

Participation's rate is 93.1%. Updated vaccination status was found by 76.92% of respondents. Hand hygiene, hydro-alcoholic solution was adopted in 52.7% cases. Invasive care, gloves were used in 98.14% of cases. In 86.1% of cases the waste arising from involving care activities with high infectious risk was thrown with regular waste. 62% of the general practitioners are less than 50-years-old. Respondents of less than 50 years formulate significantly more their wishes to do a training course in GPH (91.5% versus 54%; $p=10^{-4}$). Victims of blood exposure accidents (BEA) are significantly more prevailing among physicians over 50 years (62.2% versus 21.1%; $p=10^{-4}$).

Conclusion:

Curiously professional experience was not in favor to more GHP's adherence among our studied physician of the liberal sector. To be able to fill in the gaps of training, information and awareness about HAI and GHP, and to organize HAI fight and prevention in liberal sector, improvement of care's quality and safety is required with concrete involvement of several stakeholders in this sector.

Managing healthcare quality and security in perinatal sector through measuring patient's safety culture among care givers

Mohamed Mahjoub, Olfa Ezzi, Asma Ammar, Anis Abbadi, Wadiaa Bannour, Radhia Hellali, Mansour Njah

University Hospital Farhat Hached, Sousse, Tunisia

Introduction:

Patients' security arouses more and more decision makers and health workers. Development of safety culture is fundamental pillar to any strategy for improving quality and safety care mainly in maternity. Thus, we conducted our work in order to measure the level of patients' safety culture among healthcare professionals, in perinatal sector.

Objectives:

Measure level of patients' safety culture among healthcare professionals practicing in maternity in order to improve strategies of healthcare quality and safety in perinatal sector.

Methods:

We conducted, in 2018, a multicentric cross-sectional study among all licensed physicians (n= 87) and paramedical staff (n= 214) exercising at maternity in the region of Sousse, Tunisia (center-region of

Tunisia). Measuring instrument used is a valid questionnaire containing ten safety care dimensions.

Results:

Participation rate was 86.4% (62.1 % among physician and 90.6% among paramedical). 45% of respondents perceive that security level of their services is good.

Dimension having most developed score (73.1%) was perception of 'learning organization and continuous improvement' otherwise dimension with lowest score (34.7%) was 'support management for safety care'. This latter dimension was significantly developed among paramedical staff compared to physicians (37.4% VS 13%; p=0.019).

Conclusion:

Our study has allowed us to conclude that all dimensions of patients' safety culture need to be improved among in perinatal sector. Therefore, more efforts are necessary in order to develop a security culture based on confidence, learning, communication and team work and rejecting sanction, blame, criminalization and punitive reporting among healthcare professionals practicing in maternity.

Fifteen years of national surveillance of healthcare-associated infections in Serbia

Ljiljana Markovic-Denic[1], Vesna Suljagic[2], Gorana Dragovac[3], Zorana Djordjevic[4], Ivana Cirkovic[1], Vesna Mioljevic[5], Gordana Krtinic[6], Ivana Janicijevic[7], Violeta Rakic[8], Biljana Mijovic[9]

[1]*University of Belgrade, Faculty of Medicine, Serbia*
[2]*Military Medical Academy, University of Defence, Belgrade, Serbia*
[3]*University of Novi Sad, Faculty of Medicine; Institute of Public Health of Vojvodina, Novi Sad, Serbia*
[4]*Clinical Center of Kragujevac, Serbia*
[5]*Clinical Center of Serbia, Belgrade, Serbia*
[6]*General Hospital of Subotica, Serbia*
[7]*Institute of Public Health, Nis, Serbia*
[8]*Institute of Public Health of Serbia, Belgrade, Serbia*
[9]*General Hospital of Cacak, Serbia*

Introduction:

Surveillance of healthcare-associated infections (HAIs) is an important patient safety initiative.

Aim:

To provide an overview of the national surveillance system and the magnitude of HAI rates in Serbia.

Method:

Surveillance protocols and the national database were reviewed.

Results:

In 1997, the HAI Commission with at least one epidemiologist in every hospital became obligatory by law in Serbia. However, the National System of HAI Surveillance was defined in 2004 along with the establishment of the National HAI Commission. Two types of active surveillance are currently in use in our country: point prevalence surveys (PPS) and incidence studies at the high risk departments. Four national PPSs of HAIs were undertaken in Serbia; in November 1998, May 2005, and in November 2010 and 2017; the last one was conducted within the European PPS. The prevalence of patients with at least one HAI and the overall prevalence of HAI was 6.3% and 7.5% in 1998, 3.1% and 3.5% in 2005, 4.9% and 5.3% in 2010, and 4.3% and 4.6% in 2017, respectively. The most frequent were surgical site infections in first study (34.1% of all HAIs), and urinary tract infections in the other three surveys (29,0%, 25,9% and 21,3%). According to the incidence studies, the highest incidence rates in the previous year were recorded at the ICU (23.6%), neonatology (13.1%), and surgery units (11.0%).

Conclusion:

Despite many limitations, hospital epidemiology and infection control are rapidly growing in Serbia. Enhancing surveillance, according to the ECDC methodology should be an infection control priority in Serbia.

Knowledge, attitudes and behavior towards hand hygiene of medical students on clinical years in Belgrade

Vuk Marušić, Vladimir Nikolić, Ljiljana Marković-Denić

Institute of Epidemiology, Medical faculty, University of Belgrade

Introduction/aims:

Students' knowledge about hand hygiene (HH), as one of the most important prevention measures for microbial transmission in general, with significant impact in the reduction of healthcare associated infections (HAI) rates, is still unsatisfactory. The aim of this study was to compare medical students' knowledge, attitudes and behavior (KAB) towards hand hygiene.

Methods:

This cross-sectional study was conducted among the first clinical (fourth) and final year (sixth) medical students at Belgrade University using an anonymous questionnaire, which contained data on demographic characteristics, knowledge, attitudes, and behavior about performing of HH.

Results:

In a total of 840 medical students (response rate 83.3%) were enrolled. Statistically significant number of fourth year students stated incorrectly that HH includes hand washing with water and solid soap (88.3% vs. 81.9%, p=0.009). 71% of all, knew that HH involves HH with water and liquid soap, 21.5% knew that HH also refers to hand rubbing, and 12.5% knew about surgical hand preparation. Less than half of all (46%) knew 5 crucial moments when it's necessary to perform HH, but fourth year students showed better knowledge that HH should be performed after fluid exposure and after touching patient surroundings (p=0.025, p<0.001, respectively). The majority of students agree that HH has an enormous impact in HAI prevention (94.3%), and on patients' outcome (87.7%).

Conclusions:

Clinical year students have an average knowledge of HH, but nonetheless fourth year students have slightly better one, probably caused by an innovated curriculum and an increasing number of students who attend the elective course about HAI during studies.

Indicators of infection prevention, control (IPC) and antimicrobial stewardship programmes in Serbia

Biljana Mijović[1], Zorana Đorđević[2], Ljiljana Marković-Denić[3], Gorana Dragovac[4], Vesna Mioljević[5], Gordana Krtinić[6], Ivana Janićijević[7], Ivana Ćirković[8], Violeta Rakić[9], Vesna Šuljagić[10]

[1]*University of East Sarajevo, Faculty of Medicine, Foča, Bosnia and Herzegovina*
[2]*Clinical Center of Kragujevac, Serbia*
[3]*Universiy of Belgrade, Faculty of Medicine, Belgrade, Serbia*
[4]*University of Novi Sad, Faculty of Medicine, Novi Sad, Serbia*
[5]*Clinical Center of Serbia, Belgrade, Serbia*
[6]*General Hospital of Subotica, Serbia*
[7]*Institute of Public Health, Niš, Serbia*
[8]*University of Belgrade, Faculty of Medicine, Serbia*
[9]*Institute of Public Health of Serbia, Belgrade, Serbia*
[10]*Military Academy, Belgrade, Serbia*

Introduction:

The fourth national point prevalence survey (PPS) of healthcare associated infections (HAIs) and antimicrobial use (AM) in Serbia was conducted during November 2017, as a part of a European PPS.

Aim:

To describe the most important structure and process indicators of IPC and antimicrobial stewardship program.

Methods:
We used the Serbian translation of the standardized protocol for PPS on HAIs and AM prepared by the ECDC.

Results:
All 65 acute care hospitals stated that they had an annual IPC plan approved by the president of the hospital committee for HAI, while 98% of hospitals had prepared an IPC report in the previous year. Mean number of whole time equivalent (WTE) IPC nurse per 250 beds was 0.7, FTE IPC doctors 0.3 and WTE antimicrobial stewardship roles was 0.3. Availability of microbiology service on Saturdays, clinical and screening samples was 100%. Number of blood culture sets received and incubated per 1000 patient days was 10.8 and test performes for *C. difficile* was 3.4. Participation in surveillance networks ranged from 10.8% (surveillance of surgical site infections) to 95.4% (other surveillance network). Alcohol hand rub consumption per 1000 patient days was 20 L. Only 17.4% beds were equppied alcohol based hand rub dispensers. Multimodal strategy score HAI prevention ranged from 3.0 (pneumonia) to 3.3 (bloodstream infections and urinary tract infections).

Conclusion:
IPC and antimicrobial stewardship structure and process indicators obtained in our PPS were lower than the average in EU.

Keywords: multimodal strategy, hand hygiene

Increasing the antibiotic prudent use in a private hospital in Central Java: RASPRO best practice implementation

Ronald Irwanto Natadjijaja, Tarcisius Henry, Hadianti Adlani, Aziza Ariyani, Rika Bur

RASPRO Indonesia Study Group, Jakarta, Indonesia

Introduction:
Ronald Irwanto Antimicrobial Stewardship Program (RASPRO) has been launched as the one of Indonesian Best Practice for running the prospective antimicrobial stewardship in hospital setting. RASPRO was a copyright and inspired by selective pressure theory and antimicrobial risk stratification for predicting any possibilities of infection caused by the multi sensitive or multi resistant microorganism.

Interventions:
RASPRO predicted antibiotics that should be administered based on the disease severity, immune status, and previous antibiotics taking, hospitalization or medical instrument exposure. Through this program, hospitals guided clinicians to define the sites of infection, and when to use or not to use antibiotics and when to use broad or narrow spectrum empirically while waiting the culture result for a definitive treatment. This program has been implemented and studied in a private hospital in Central Java, Indonesia.

Results:
In mid of 2019, the 3 months before-after RASPRO implementation study was done. We calculated a significant decreasing rate of inappropriate antibiotic used from 65.45% to 27.37% and decreasing rate of prolonged antibiotic administered from 4.09% to 1.61%. Increasing rate of shorter antibiotics use from 7.35% to 16.05%, increasing rate of Levofloxacin Define Daily Dose (DDD) from 2.38 to 15.26 and decreasing of cephalosporin DDD rate from 19.88 to 15.41 also noted. The rate of total antibiotics used per inpatient was 15.22% reduced.

Conclusions:
RASPRO guided clinicians for using antibiotics in prudent. In general, RASPRO implementation showed a good impact for controlling the antimicrobial usage in daily practice.

Keywords: RASPRO, antibiotic, stewardship

The self-assessment of the IPC programme in General Hospital "Danilo I" Cetinje

Milena Popovic Samardzic, Sonja Radojicic, Ivana Rudovic

General Hospital Danilo I Cetinje, Montenegro

Objective:

In order to quantified effects of preventing measures we conducted self-assessment framework according to the recommendations in the WHO Guidelines. Core components of IPC programmes helped us to detect deficiencies in our IPC management. Self-assessment framework is diagnostic tool which revealed how to detect and overcome existing problems in order to reach international IPC requirements.

Methods:

We used questionnaire composed of eight sections. Each section/core component carries a certain number of points that ultimately brings a score of 100 points. We calculated score for every section and total score for the hospital.

Results:

We conducted the self-assessment framework of the IPC programme in General Hospital "Danilo I" Cetinje in order to evaluate eight core component and to asses how many of the recommendations are currently implemented at the facility level. The average score on national level was 411 compared to our hospital score 395. This means that the assigned level for our hospital is basic. The interpretation of this result suggests that some aspects of the IPC core components are in place, but not sufficiently implemented. Further improvement is required. The main gaps are in core component 2 (IPC guidelines), component 3 (IPC education and training), component 4 (HAI Surveillance), component 5 (multimodal strategies) and component 6 (monitoring/audit of IPC practices, feedback and control activities). We have showed strengths on core component 1 (IPC programmes), component 7 (workload, staffing and bed occupancy) and component 8 (built environment, materials and equipment for IPC).

Conclusion:

Our results suggest that some aspects of the IPC core components are in place, but not sufficiently implemented. Further improvement is required.

The self-assessment of the IPC programme in clinic of orthopeadic surgery

Ivana Radovanovic, Milica Milanovic, Leposava Simic, Andrijana Acimovic, Dejana Raseta

Clinical Center Serbia, Belgrade, Serbia

Objective:

Hospital infection (HI) is global, persistent and a serious problem, one of the main causes of increased morbidity and mortality of hospitalized patients, and their economic dimension is important. The incidence of HI is much higher where the surveillance system for these infections is inadequate or has not yet been established.

Methods:

A questionnaire has been used, containing eight sections. In each section (core component), a maximum score of 100 points can be achieved.

Results:

Trained ICN and epidemiologist conducted the self-assessment of the IPC programme in the clinic of orthopaedic and traumatic surgery to evaluate how the eight core component recommendations of the guidelines targeted at the facility level are currently implemented. The overall score for this hospital was 412.5. This means that the assigned level for this hospital is intermediate. The interpretation of this result suggests that most aspects of the IPC core components are appropriately implemented. The results of the self-assessment at facility level showed evidenced strengths on core component 1 (IPC programmes) and core component 4 (HAI surveillance), while core component 2 (IPC guidelines), 3 (IPC education and training), 5 (multimodal strategies) and 6 (monitoring/audit of IPC practices, feedback and control activities) need further improvement.

Conclusion:
The interpretation of the results suggests that most aspects of the IPC core components are appropriately implemented in the clinic. Facility should continue to improve the scope and quality of implementation and focus on the development of long-term plans to sustain and further promote the existing IPC programme activities.

Keywords: HAI self-assessment, IPC, IPCF

Risk factors for Clostridium difficile infection in patients from Emergency Hospital Braila Romania

Delia Mihaela Rasnoveanu

Faculty Medicine and Pharmacy, University "Dunarea de Jos" Galati, Braila, Romania

Aim:
To determine what are the risk factors for the *Clostridium difficile* infection (CDI) in the Emergency Hospital of Braila, Romania.

Methods:
We studied 138 patients admitted in 2017 in the hospital with CDI. Infection was confirmed by testing toxins in laboratory. We collected data about: age, sex, environment, risk factors, wards, evolution.

Results:
Age medium was 69 years, mostly between 65 and 80. Sex was similar: 56% female. Environment: 67% from urban area, 33% from rural area. Wards in which patients are admitted: infectious diseases = 43%, medical wards = 40% and surgical wards = 17%.

Risk factors:
Use of antibiotics for more than 3 months = 75%, use of antacids and proton pump inhibitors = 38%, hospitalization in last 6 months = 32%, other chronic diseases (diabetes, hepatitis) = 7%, use of chemotherapy = 3%, use of immunosuppressive treatment = 1%.

Evolution: 96% had a good evolution, 2 cases had recurrences, 4 deaths by other causes.

Conclusions:
Risk factors for CDI are similar with other studies. Particular in Romania is the use of antibiotics also without prescription and for long periods. For this reason we have a great number of CDIs. The health politics to reduce the use of antibiotics is our main purpose.

Epidemiology of surgical site infections after hip and knee arthroplasty - seven years of observation at a provincial hospital in Southern Poland

Róża Słowik[1], Anna Różańska[2], Jadwiga Wójkowska-Mach[2], Marta Wałaszek[3]

[1]St. Luke Voivodship Hospital, Tarnów, Poland
[2]Jagiellonian University Medical College, Krakow, Poland
[3]Poland State Higher Vocational School, Tarnów, Poland

Introduction/aims:
By the European Centre for Disease Control and Prevention (ECDC), knee and hip arthroplasty (KPRO and HPRO) are among recommended procedures for active surveillance of surgical site infections (SSI). The aim of the study was to analyze the incidence of SSI after these procedures taking into account the NHSN standard risk index.

Methods:
The study was conducted in the years 2012-2018 in the Orthopedics and Trauma Department in Specialist Hospital. The study involved 2340 operated patients: 1756 HPRO and 584 KPRO. The surveillance was based on the ECDC HAI-Net SSI methodology.

Results:
Thirty seven SSI cases were detected, including 26 in HPRO and 11 cases in KPRO. The average incidence of SSI was 1.6% (1.5% for HPRO and 1.9% for KPRO). Patients' median age was 70 years. Patients with SSI had a significantly longer stay in the ward.

In KPRO, the incidence of SSI was higher than expected, calculated according to the standardized risk index (SIR). No significant differences were observed in incidence rates according to risk index classification, for both procedures. Coagulase-negative staphylococci were dominating etiological factor of SSI.

Conclusions:

Less than thirty infections were reported for HPRO and 11 for KPRO during the seven-year surveillance period. For one center, several years of data collection enabled the performance of basic epidemiological and statistical analyzes. This reveals that the optimal solution is to conduct long-term and multi-center surveillance as part of a network, which would allow in-depth analyzes, including comparative ones.

A nationwide assessment of the burden of healthcare associated infections and antimicrobial use among surgical patients. Results from Serbian point prevalence study

Vesna Šuljagić[1], Vesna Mioljević[2], Zorana Đorđević[3], Gorana Dragovac[4], Biljana Mijović[5], Ivana Janićijević[6], Gordana Krtinić[7], Violeta Rakić[8], Ivana Ćirković[9], Milica Bajčetić[9], Vladimir Nikolić[9], Ljiljana Marković-Denić[9]

[1]Military Medical Aacademy, University of Defence, Belgrade, Serbia
[2]Clinical Center of Serbia, Belgrade, Serbia
[3]Clinical Centre of Kragujevac, Serbia
[4]Institute of Public Health Vojvodina, University of Novi Sad, Faculty of Medicine, Serbia
[5]University of East Sarajevo, Faculty of Medicine, Foča, Bosnia and Herzegovina
[6]Institute of Public Health, Niš, Serbia
[7]General Hospital of Subotica, Serbia
[8]Institute of Public Health of Serbia, Belgrade, Serbia
[9]University of Belgrade, Faculty of Medicine, Serbia

Introduction:

Healthcare-associated infections (HAI) are a serious complication impacting morbidity, mortality, and healthcare costs worldwide. We aimed to estimate the difference in prevalence and risk profile of HAI rates and antimicrobial use (AMU) in patients exposed to recent surgery compared to not exposed to surgery in Serbian acute care hospitals.

Methods:

Methodology and definitions were based on the most recent European Centre for Disease Control and Prevention point prevalence survey protocol. The study population consisted of patients that underwent surgery within the past 30 days (90 days if implant surgery) and patients who did not undergo surgery.

Results:

The prevalence of HAIs was higher among patients exposed to surgery (7.2%) then not exposed to surgery (2.9%) ($p<0.0001$) in a total of 12,478 study population from 61 hospitals. Male sex, ultimately and rapid fatal underlying disease according to McCabe score, tertiary hospital level and presence of a urinary catheter, central vascular catheter, and mechanical ventilation were independent risk factors for HAI in patients exposed to surgery, while antibiotics were a protective factor for HAI. Patients non-exposed to the surgery (64.3%) were treated more often for community-acquired infections, while 60.1% of patients exposed to surgery received antibiotics for surgical prophylaxis ($p<0.0001$). Ceftriaxone was the most frequently used antibiotics in both groups.

Conclusion:

We provided an insight into the burden of HAIs and AMU among Serbian acute-care hospitals and highlighted several priority areas and targets for quality improvement.

Keywords: prevalence, HAI, antimicrobial use, surgery

Eighteenth Congress of the International Federation of Infection Control

11-14 March 2020

Belgrade, Serbia

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