Device associated infections (DAIs) in African Countries and other Countries with Limited resources

Category: Surveillance of Healthcare Associated Infection

MOUSTAFA ABDELNASSER, MICROBIOLOGY, IMMUNOLOGY & INFECTION CONTROL, FACULTY OF MEDICINE, AL-AZHAR UNIVERSITY, CAIRO, EGYPT MOSTAFA_ONLINE1@YAHOO.COM

Joint IPNET/ICAN

16/6/2014





Introduction

- Patients in intensive care units (ICUs) are a significant subgroup of all hospitalised patients, accounting for about a quarter of all hospital infections.
- The prevalence of infection and mortality rates are higher in countries with limited resources associated, especially with the quality of care.



- The burden of antibiotic usage is also very high in ICUs.
- Healthcare associated (HA) ICU infections and antimicrobial resistance are global problems, and many epidemiological studies are carried out, especially from developed countries.







Objectives

- To spot lights on the on the most common causes of ICUs infections i.e DAIs in countries with limited resources especialy, African Countries.
- To present examples/cases from developed and developing countries.
- To recommend solutions to reduce these infections.



Patient Safety

A World Alliance for Safer Health Care





WHO FACT SHEET

- While urinary tract infection is the most frequent health care-associated infection in high-income countries, surgical site infection is the leading infection in settings with limited resources, affecting up to One-third of operated patients; this is up to 9 times higher than in developed countries.
- In high-income countries, approximately **30%** of patients in ICU are affected by at least one health care-associated infection.



WHO FACT SHEET (Cont')

• In low- and middle-income countries the frequency of ICU-acquired infection is at least **23** fold higher than in high-income countries;

device-associated infection densities are up to 13 times higher than in the USA.

• Newborns are at higher risk of acquiring health care-associated infection in developing countries, with infection rates three to **20** times higher than in high-income countries.

Classification of Device Associated Infections (DAIs)

Most of DAIs include:

Blood stream infections especially
central venous catheter-associated infection (CVCAI),
Ventilator associated provincia (VAP) and

- 1. Ventilator-associated pneumonia (VAP), and
- 2. Catheter-associated urinary tract infection (UTI).





Device Type

Figure. 2. Prevalence of different invasive medical devices among residents of Veterans Affairs Community Living Centers in 2005 and 2007, respectively. (Data from Tsan L, Davis C, Langberg R, et al. Prevalence of nursing home-associated infections in the Department of Veterans Affairs nursing home care units. Am J Infect Control 2008;36(3):173–9; and Tsan L, Langberg R, Davis C, et al. Nursing home-associated infections in Department of Veterans Affairs routing living centers. Am J Infect Control 2010;38(6):461–6.) 16/6/2014





Figure 4. The potential sources by which an intravascular device may become infected. HCW, healthcare worker. (Adapted from Crnich CJ, Maki DG. The promise of novel technology for the prevention of intravascular device-related bloodstream infection. I. Pathogenesis and short-term devices. Clin Infect Dis 2002;34(9):1232–42; with permission.)





Organisms causing ICUs infections are:

- 1. Enterobacteriaceae spp,
- 2. Staphylococcus aureus,
- 3. Pseudomonas spp.,
- 4. Candida spp.,
- 5. Coagulase-negative staphylococci,
- 6. Acinetobacter spp.,
- 7. Stenotrophomonas spp.
- 8. Streptococcus spp. and
- 9. Enterococcus spp.



associated with short- and long-term intravascular devices (IVDS). (Data from Maki DG, Kluger DM,Crnich CJ. Microbiology of intravascular device-related infection in adults: an analysis of 159 prospective studies and implications for treatment [abstract]. In: Proceedings andAbstracts of the 40th Annual Meeting of the Infectious Disease Society of America. Chicago:Infectious Disease Society of America; 2002.)

Joint IPNET/ICAN



Main problems in developing countries are:

- 1. poor hygiene and waste disposal,
- 2. inadequate infrastructure and equipment, understaffing,
- 3. overcrowding,
- 4. lack of basic infection control knowledge and implementation,
- 5. unsafe procedures, and
- 6. lack of guidelines and policies.



Constraints to IC in Africa at the National Level

- 1. Absence of policies
- 2. Absence of guidelines for IC
- 3. Insufficient funds
- 4. Inappropriate organizational structures & coordination
- 5. Lack of data collection
- 6. Inadequate human resources
- 7. Lack of monitoring & evaluation
- 8. Insufficient commitment of partners
- 9. Inadequate infrastructure
- 10. Insufficient sensitization of HCWs to policies

First GPSC African workshop, Uganda, December 2007





Joint IPNET/ICAN

16/6/2014



What to do?

- Laboratory is one of the high-risk places in hospitals and counter tops would be cleaned in every shift by chlorine 0,5 % or lysol 5 %.
- Also labeling of specimens should be clear.





What to do?

- Instruments should be cleaned after decontamination with soap and water and soft brush. This one is very rough.
- Rusted trays tell that chlorine is not 0,5 % or instruments have been there for a long time.
- Staff must be taught!!





What to do?

26

• This kind of places in the hospital is not convincing about the proper hospital hygiene.

STOPPING INFECTION IS IN YOUR HANDS



Next to hand hygiene the simple act of rubbing an IV hub with an alcohol wipe for 10 seconds prior to plugging will help prevent catheter-related sepsis. This simple act can decrease hospital-acquired infections in all patients.

Scrub the Hub Before You Plug!

Joint IPNET/ICAN

Here's how you can prevent Catheter Line Associated Bacteremia (CLAB) in your patient!

Make sure you thoroughly scrub the injection port with alcohol before injecting IV medications.



Don't forget to "Scrub the Hub."

MC HealthCare

Joint IPNET/ICAN

VAP Bundles

- 1. Elevation of the head of the bed
- 2. Daily "sedation vacations" and assessment of readiness to extubate
- 3. Peptic ulcer disease prophylaxis
- 4. Deep venous thrombosis prophylaxis
- 5. Daily oral care with chlorhexidine

Key Prevention Strategies for CAUTI

- 1. Avoid unnecessary urinary catheter
- 2. Insert using aseptic technique
- 3. Maintain catheter based on recommended guidelines
- 4. Review catheters daily necessity and remove promptly (when no longer needed)

CRBSI Bundles

- 1. Hand hygiene
- 2. Maximal barrier precautions upon insertion
- 3. Chlorhexidine skin antisepsis
- 4. Optimal catheter site selection, with subclavian vein as the preferred site for non-tunneled catheters
- 5. Daily review of line necessity with prompt removal of unnecessary lines



Constrains & Hopes

32

 Although it is difficult to solve some problems associated with financial hardship in developing countries, most solutions are simple and not resource demanding.



Suggested Solutions

- Implementing system-wide surveillance,
- training,
- education and good communication,
- using devices appropriately and following proper procedures,
- ensuring optimal hand hygiene practices and rational antibiotic utilisation,





Future Prospective

- To be successful, these solutions ultimately require a change of health-care workers' behavior in these countries.
- Establishment of DAIs group on the national and regional (African group) levels.
- Establishment of DAIs African Network.
- Exchange and implement success stories in African and developing.



- Crnich CJ, Maki DG (2007). The promise of novel technology for the prevention of intravascular device-related bloodstream infection. I. Pathogenesis and short-term devices. Clin Infect Dis 2002;34(9):1232–42; with permission.)First GPSC African workshop, Uganda.
- Greene L, Marx J, Oriola S (2008) .Guide to the Elimination of Catheter-Associated Urinary Tract Infections (CAUTIs). APIC Guide.
- Greene L, and Sposato K S (2009) .Guide to the Elimination of Ventilator-Associated Pneumonia. APIC Guide.
- Juthani-Mehta M, Tinetti M, Perrelli E, et al (2007). Diagnostic accuracy of criteria for urinary tract infection in a cohort of nursing home residents. J Am Geriatr Soc. 55 (7): 1072–7.
- Maki DG, Kluger DM,Crnich CJ (2000). Microbiology of intravascular device-related infection in adults: an analysis of 159 prospective studies and implications for treatment [abstract]. In: Proceedings and Abstracts of the 40th Annual Meeting of the Infectious Disease Society of America. Chicago: Infectious Disease Society of America.
- Murphy, C, Andrus M, Barnes S, Permanente K, Garcia R, Juraja, M, Khoury R, Krystofiak S, Love K, McCormick R, Resnik S and Richmond A (2009) .Guide to the Elimination of Catheter-Related Bloodstream Infections. APIC Guide.
- Tsan L, Davis C, Langberg R, et al. Prevalence of nursing home-associated infections in the Department of Veterans Affairs nursing home care units. Am J Infect Control 2008;36(3):173–9.
- Tsan L, Langberg R, Davis C, et al. Nursing home-associated infections in Department of Veterans Affairs community living centers. Am J Infect Control 2010;38(6):461–6.
- WHO. Systematic review conducted by WHO, 1995–2008; HCAI: health care–associated infection. World Health Organization, Geneva.