Infection control in developing countries

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Outline

- Setting the scene
- Highlight the key issues
- Look at the possible solutions by applying basic infection control practices to reduce infections
- Conclusions

Leading causes of death

53.9 million from all causes, worldwide

Incidence of Healthcare associated infections

- Lack of reliable data affects estimates on the burden- millions worldwide every year
- No health-care facility, no country, no health-care system in the world is free of this problem
  - Developed world: 5–10% patients
  - Developing countries: risk is at least 2 times higher and can exceed 25%
  - ICU - 30% patients; attributable mortality as high as 44%

Infection control in developing countries

- None/inadequate Infection Control infrastructure
- Lack of strategic direction at national/local level
- Lack of resources/financial governance
- Well-organized, effective infection control programmes are confined to academic institutions, well-funded government and private hospitals
- Smaller hospitals in urban areas and hospitals in rural centres have less resources

The Study on the Efficacy of Nosocomial Infection Control (SENIC Study)

- 6% of infection can be prevented by *minimal* infection control efforts
- 32% could be prevented by a well organised & highly effective infection control programme

Even though infection rates can be drastically reduced in most hospitals in developing countries, the rates cannot be reduced below 5% unless excessive costs are incurred ‘irreducible minimum’.

*Ayliffe GA: Infection Control 1986;7:92-95*

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**COST SAVING MEASURES**

**Unnecessary and wasteful practices**

- Routine
  - Microbiological Swabbing of environment
  - Disinfectants for environmental cleaning e.g. floors & walls
  - Fumigation of isolation room with formaldehyde
- Unnecessary
  - Use of overshoes and dust attracting matt
  - Personal Protective Equipment in the Intensive Care, & Neonatal Unit
- Excessive/unnecessary use of
  - IM/IV injections
  - Insertion of indwelling devices e.g. IV lines, urinary catheters, nasogastric tube
  - Antibiotics both for prophylaxis and treatment

*Damani NN. Journal of Hospital Infection 2007; 65(S1): 151-154.*

**COST SAVING MEASURES**

**Antibiotic prescribing**

35% of the total healthcare budget is spent on antimicrobials versus 11% in developed countries.

*Isturiz RE et al. Infection Control Hospital Epidemiology 2000;21:394-397*

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**NO COST MEASURES**

**Good infection control practices**

- Aseptic technique for all sterile procedures
- Remove indwelling devices when no longer needed
- Isolation of patient with communicable diseases/multi-resistant organism
- Avoid unnecessary Per Vaginal (PV) examination in women in labour
- Placing mechanically ventilated patients in a semi-recumbent position
- Minimize number of people in operating theatre

*Damani NN. Journal of Hospital Infection 2007; 65(S1): 151-154.*

**LOW COST MEASURES**

**Cost effective practices**

- Education and practical training in
  - Hand hygiene
  - Aseptic technique
  - Appropriate use of PPE
- Sharp use and disposal in robust containers
- Provision of alcoholic hand rub and hand washing facilities for hand hygiene
- Use of adequately sterile items for invasive procedures
- Use of single-use disposable sterile needles and syringes
- Adequate decontamination of items/equipment between patients
- Provision of Hep B vaccination for healthcare workers
- Post exposure management of healthcare workers

*Damani N.N. Journal of Hospital Infection 2007; 65(S1): 151-154.*
Setting Priority

- Identify **preventable** healthcare associated infections
- Target preventable HCAIs in **high priority areas**
- Require **minimum resources** with **maximum benefit**

Priority setting

- **Risk Factor** = **Frequency** (Probability) \* **Consequence** (Impact)

- **Surveillance/outbreaks** data will give you the probability or frequency of infection from a task or a procedure
- **Risk assessment** will give you impact or consequence to patient as a result of a task or a procedure.

Risk assessment

**Identify Risk**
- Identify tasks & activities that put patients, health workers & visitors at risk
- Quantify risk e.g. consequences can be classified into:
  1. Catastrophic
  2. Major
  3. Moderate
  4. Minor

**Risk Analysis**
- Why are they happening?
- How often they are happening?
- How much they are likely to cost?

Prioritizing risks

- **High severity**
  - Blood stream infections
  - **High frequency**

- **Low severity**
  - Infections from linen
  - **Low frequency**

**Intermediate severity**
- Surgical site infections
  - **High frequency**

Effective and feasible interventions

- **Bangladesh**
  - Topical emollient therapy was used to improve the function of skin as a barrier against infections.
  - Overall preterm babies treated with sunflower seed oil during the first few days/weeks of life were **41% less likely to develop nosocomial infections**.

  Damstadt GL et al. Lancet 2005
Nosocomial infections in the Neonatal care unit
(Aga Khan Hospital, Karachi, Pakistan)

- Active involvement of mother in regular monitoring of babies
- Strict hand washing before and after handling babies
- Co-bedding of mother and infant (use of a heated cot as required & minimum use of incubators)
- Encourage breast feeding (less need for Parenteral feeding)
- All procedures were undertaken by trained nurse
- Minimal visitors

Outcome
- Reduction in Nosocomial sepsis


Neonatal sepsis among NICU
(University Hospital in Egypt)

- Increase rates of early onset neonatal sepsis among infants in ICU
- Mortality rates : 55%
- All infants placed on IV fluids and antibiotics


Neonatal sepsis among NICU
(University Hospital in Egypt)

- Poor understanding of infection control
- Unsafe practices in the preparation of IV fluids
- Reuse of individual bags (multiple infants share one bag)
- Opened IV fluids: Contaminated with Klebsiella spp
- Unopened IV fluids: no growth
- NICU environmental surfaces: Klebsiella spp predominant

Yassin S. et al. 5th IPC Congress Malta, 2003

Admissions, Deaths and Mortality Rates
(Pretaxpoe training
(U2 NICUs in Egypt Dec 2001 (ave 2002)

Impact of hand washing on child health
Randomised controlled trial in Karachi, Pakistan.

Hand washing with soap and water

Children under age of 5 years
- 50% lower incidence of pneumonia

Children under age of 15 years
- 53% lower incidence of diarrhoea
- 34% lower incidence of impetigo


Impact of Staff Education Programme on Ventilator-associated Pneumonia
Aga Khan Hospital, Karachi, Pakistan

Reduction in incidence of VAP from 13.2 to 6.5 episodes /1000 ventilator days

Reduction in incidence of VAP from 12.6 to 5.7 episodes /1000 ventilator days
Conclusions

- Identify unsafe, unnecessary and ineffective infection control practices
- Divert resources to apply basic evidence based practice in Infection control
- Implement simple & effective solutions according to local need and resources which are achievable and affordable

*Simple measures do save lives!*