



Libyan international medical university

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3rd year 2017 – 2018



Nosocomial infection associated with ICU patients and Devices

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Abstract:

Nosocomial infections or healthcare associated infections occur in patients under medical care. These infections occur worldwide both in developed and developing countries. Nosocomial infections accounts for 7% in developed and 10% in developing countries. As these infections occur during hospital stay, they cause prolonged stay, disability, and economic burden. Nosocomial infections can be controlled by practicing infection control programs, keep check on antimicrobial use and its resistance, adopting antibiotic control policy.

Introduction:

‘Nosocomial’ or ‘healthcare associated infections’ (HCAI) appear in a patient under medical care in the hospital or other health care facility which was absent at the time of admission.

Invasive devices such as catheters and ventilators employed in modern health care are associated to these infections. Of every hundred hospitalized patients, seven in developed and ten in developing countries can acquire one of the healthcare associated infections.

According to Extended Prevalence of Infection in Intensive Care (EPIC II) study, the proportion of infected patients within the ICU are often as high as 51%.

With increasing infections, there is an increase in prolonged hospital stay, long term disability, increased antimicrobial resistance, increase in socio-economic disturbance, and increased mortality rate.

Types of nosocomial infections:

1. Central line associated blood stream infections
2. Catheter associated urinary tract infections
3. Surgical site infections
4. Ventilator associated pneumonia

Nosocomial Pathogens:

Pathogens responsible for nosocomial infections are bacteria, viruses and fungal parasites. These microorganisms vary depending upon different patient populations, medical facilities and even difference in the environment in which the care is given.

Bacteria:

Bacteria are the most common pathogens responsible for nosocomial infections. Some belong to natural flora of the patient and cause infection only when the immune system of the patient becomes prone to infections. Acinetobacter is the genre of pathogenic bacteria responsible for infections occurring in ICUs. It is embedded in soil and water and accounts for 80% of reported infections. Bacteroides fragilis is a commensal bacteria found in intestinal tract and colon. It causes infections when combined with other bacteria. Clostridium difficile cause inflammation of colon leading to antibiotic-associated diarrhea and colitis, mainly due to elimination of beneficial bacteria with that of pathogenic. C.difficileis transmitted froman infected patient to others through healthcare staff via improper cleansed hands.

Enterobacteriaceae cause infections if travel to other body parts from gut; where it is usually found. Enterobacteriaceae constitute Klebsiella species and Escherichia coli. Their high resistance towards

carbapenem causes the defense against them more difficult. Methicillin-resistant S. aureus (MRSA) transmit through direct contact, open wounds and contaminated

hands. It causes sepsis, pneumonia and SSI by travelling from organs or bloodstream. It is highly resistant towards antibiotics called beta-lactams.

Viruses:

Viruses are also an important cause of nosocomial infection. Usual monitoring revealed that 5% of all the nosocomial infections are because of viruses. They can be transmitted through hand-mouth, respiratory route and fecal-oral route. Hepatitis is the chronic disease caused by viruses. Healthcare delivery can transmit hepatitis viruses to both patients and workers. Hepatitis B and C are commonly transmitted through unsafe injection practices. Other viruses include influenza, HIV, rotavirus, and herpes-simplex virus.

Control of Nosocomial infections:

- 1- Infection control programs
- 2- Appropriate antimicrobial use
- 3- Antibiotic control policy
- 4- Routine screening for ICU devices, staff.
- 5- Using aseptic techniques and procedures

Conclusion:

With increased burden of nosocomial infections and antimicrobial resistance, it has become difficult for healthcare administrations and infection control committees to reach the goal for elimination of intervals. However, by practicing sound and healthy ways for care delivery designed by infection control committees, An efficient surveillance method guided by WHO can help healthcare institutes to devise infection control programs. Proper training of hospital staff for biosafety, proper waste management and healthcare reforms and making general public aware of these endemic infections can also help in reduction of nosocomial infections.

References:

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NB: last internet access to those websites was at march 2018