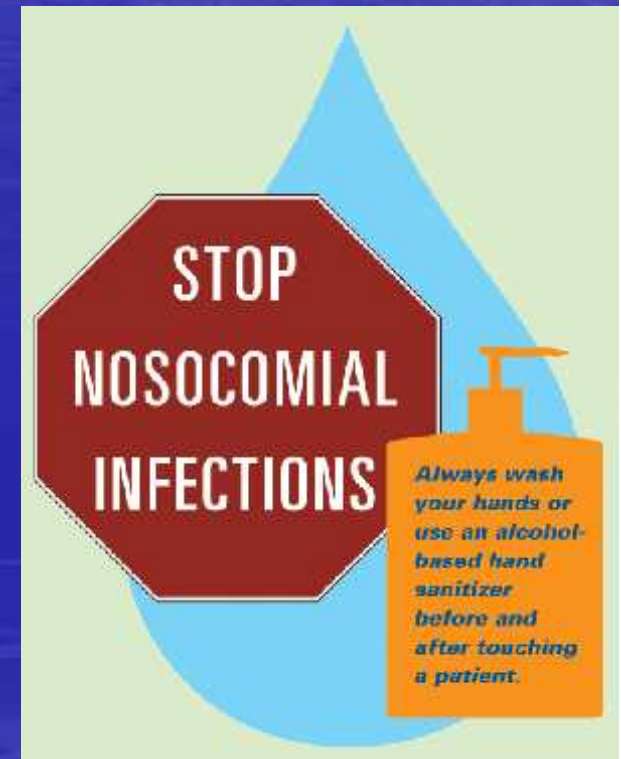


Nosocomial infection

Hospital acquired
infections



Instructional Objectives:

At the end of the lecture the student would be able to:

- 1-Define Nosocomial infections.
- 2- Demonstrate the main clinical characteristics of Nosocomial infections.
- 3-Point out the occurrence of the disease.
- 4-List the causative agents, mode of transmission, and incubation period of Nosocomial infections.
- 5-Define the control strategies of Nosocomial infections.
- 6-List the main preventive measures of Nosocomial infections.

An infection occurring to a patient in hospital or other health care facility in whom it was not present or incubating at the time of admission or the residual of an infection acquired during a previous admission .

Includes: infection acquired in the hospital but appearing after discharge & also infections among the staff of the facility

- ✓ Occurs at rate of approximately 5-10% admission in some hospitals
- ✓ Many nosocomial infections are associated with an :
 - Extended length of stay
 - Substantial morbidity &
 - Prolonged therapy

if medical staff are not adequately trained & guidelines not well developed & monitored, this will increase Nosocomial infection.

Descriptive epidemiology

Agent



host

Agent factors:

- Pathogenicity & virulence
- Invasiveness & toxicity
- Tissue selectivity
- Antigenicity
- Viability
- Dosage of the infection

Host factors:

- Resistance & immunity
- Genetic factors
- Physiological factors
- Age & sex
- Social & habitual factors

Environmental factors :

- ➔ Physical
- ➔ Biological
- ➔ Socio-cultural
- ➔ Economic

Epidemiological Triangle

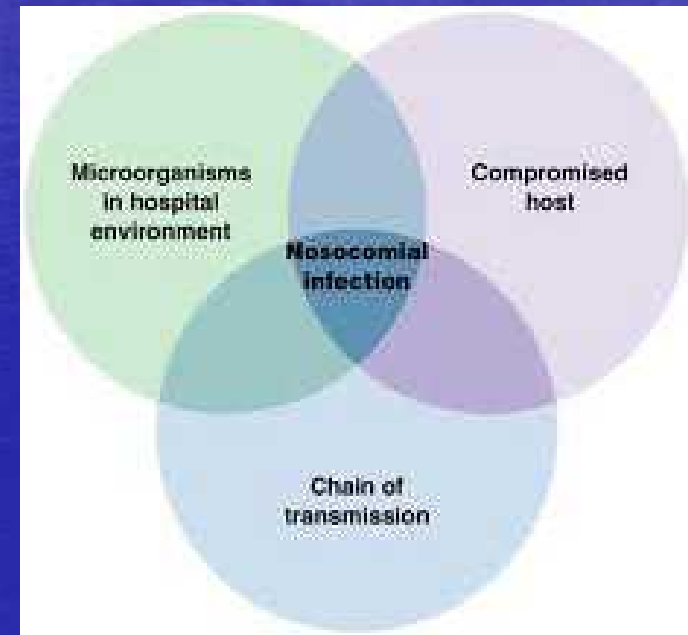
- Diagnostic procedures , medical or surgical therapy ..it can cause..
infection
- Potent immunosuppressive ,chemotherapeutic agents &antibiotics
affect normal flora
- Exposure to persons who are infected or carriers can transmit inf. (health workers or patients)

Infection rate differ considerably among hospitals

- Referral hospitals generally have higher rate than community hospitals:
(More complex patient mix & more aggressive modes of therapy used)

General risk factors of NI within the hospital include :

- Prolonged stay (>/ 48hrs)
- Mechanical ventilation
- Diagnosis of trauma
- Urinary catheter



Sources of Hospital-Acquired Infections



Prevention (general outbreaks):

- Investigation of reservoir & mode of transmission
- Appropriate use of diagnostic procedures ,invasive devices & medical therapy particularly **antibiotics**
- Hospital environment may be modified
- Strategies to proper use of isolation materials hand washing ,& other effective approaches to prevent transmission .





Main categories of Nosocomial infection

1. Urinary Tract Infection:

- IT accounts 1/3 of NI
- 80% of NUTIs caused by urinary catheters
- The typical UTIs prolongs hospital stay
- The prevalence of bacteruria during a short term use of catheter is:
approximately 15% compared with a prevalence of 90% in along term use

Risk factor for bacteruria:

- ✓ Duration of catheterization
- ✓ Micro bacterial colonization of the drainage bag
- ✓ No antibiotic use
- ✓ Female gender
- ✓ Diabetes mellitus
- ✓ Abnormal serum creatinine
- ✓ Errors in catheter care

Prevention

a. Prevention of catheterization by the use of alternative approach

- ➔ Patient training
- ➔ Medication
- ➔ Surgery
- ➔ Use of special clothes & bags
- ➔ Intermittent catheterization
- ➔ Use of external collection & urinary diversion

b. Prevention of bacteruria once
catheterized recommended

→ minimizing the duration

→ closed drainage system

Good hand washing after caring each patient is the
single measure most –likely to prevent cross-
transmission of urinary pathogens



2. Lower respiratory infection (LRI) & pneumonia

- It accounts >13% of NIs
- CFR 20-50%
- N pneumonia associated with an excess length of stay of >/one week
- Most of NLRI occur in ICU & surgery recovery units

Predisposing factors

- ❖ Endotracheal intubations
- ❖ Tracheostomy
(lead to decrease LRT defense mechanisms
..drying and direct rout of entry)

- ❖ Ventilator
- ❖ Contaminated aerosols
- ❖ Other contaminated equipment
- ❖ Chronic lung diseases
- ❖ Advanced age
- ❖ prior administration of antibiotics
- ❖ Immunosuppression.

Prevention

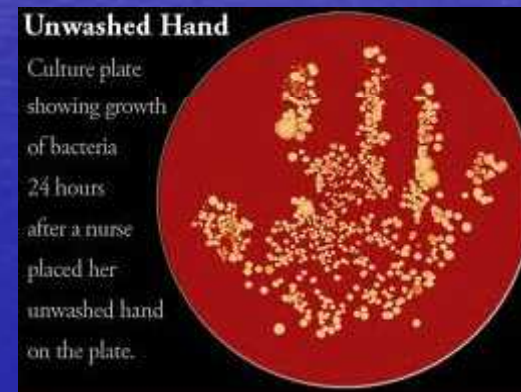
- General hygienic measures
- Use of barrier isolation materials
- Routine decontamination of respiratory equipments
- Using gloves ,gowns & masks
- Annual influenza immunization of pts & hospital staff

3. Surgical wound infections (SWIs)

- sWIs are now the 2nd most common NI accounting for at least 17%
- Infection rate varies according to:
 - operative site
 - patient co morbidity

Sources :

- ☠ Inoculation from pt's residual flora
- ☠ Contaminated host tissues
- ☠ Surgical team members hands at the time of surgery



- ☠ Airborne contamination at the time of surgery
- ☠ Post operative drains or catheters

Prevention:

- ✓ Not shaving the operation site with a razor
- ✓ Disinfection of the skin at the incision site
- ✓ Appropriate use of preoperative antibiotics when indicated
- ✓ Perioperative antibiotics started immediately before surgery & continued for up to 24 hrs after are effective

4. Nosocomial Diarrhea:

A common problem

Risk factors

1. Older age
2. sever underlying disease
3. Hospitalization of more than one week
4. Long stay in the ICU
5. Prior antibiotic treatment.

5. Blood stream infection (BSIs)

❖ Account for 14% of NIs

Primary bacteremia: isolation of bacterial blood stream pathogen in the absence of an infection at another site

Secondary bacteremia: occurs when bacteria are isolation from the blood during an infection with the same organism at another site : i.e UTIs, SWIs, LRIs

Source:

- 1-IV catheters , intrinsic IV fluid contamination ,multi dose parenteral IV medications
- 2-Contamination of antiseptics
- 3-Contamination of hands of health workers
- 4-External colonization of the catheter