
HOSPITAL INFECTION

Dr. Nita Jarmarwala & Dr. Mayur Jarmarwala drmayur@vsnl.com

Introduction

Hospital infection is also called Nosocomial infection. It is the single largest factor that adversely affects both the patient and the hospital.

The English word Nosocomial is derived from the Greek NOSOKOMEION meaning "hospital". Nosocomial infection is that which develops in the patients after more than 48 hours of hospitalization. Bacterial infections, which appear within first 48 hours of admission, are considered as community acquired.

Why is infection such a problem even after 100 years since Lister and Pasteur ?

1. Advancing age of the patients, as they are more prone to infection.
2. Use of sophisticated and complicated equipment which is not easy to clean, disinfect or sterilize.
3. Increasing specialization bringing together patients susceptible to some type of infection.
4. Increased use and trial use of antibiotics resulting in drug resistance.
5. Higher rate of staff turnover makes it difficult to maintain uniform standards
6. Effective sterilization system as yet not fully understood by all concerned.

Extent of problem

In western countries the range of hospital infections varies a low of 0.8 to a high of 8 (A comprehensive study done in USA showed a median infection rate of 3 per hundred discharged).

In India Hospital infection estimates vary from 10 to 30 percent, the least being about 3 percent in the best of hospitals. Hospital infection occurs in every hospital; the difference is in the degree of the severity only. It adversely affects the image of the hospital.

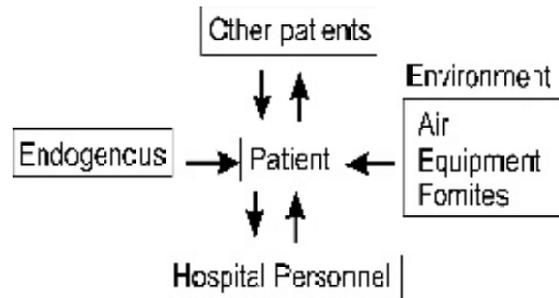
How infection perpetuates

What affects the development of Hospital infection is the relationship between the agent, the patient (host) and the environment.

Source of infection

1. Infection can be acquired as cross-infection from the other patients, hospital staff and visitors
2. Hospital environment
3. Self infection from microbes that are carried by the patient himself on admission to the hospital

Actually it is a very difficult task to trace the source of infection.



The Agent

The entire spectrum of microbes from bacteria to viruses, fungi, and protozoa has been incriminated in Hospital infection. Nearly 25 to 50 % of all Hospital infections have been found to be due to gram negative organisms and 10 % of infections are due to staphylococci.

Routes of spread of infection

Droplets route
Contact route
Environmental route
Intravenous route

High risk areas in the hospital

These areas in the hospital carry a greater risk:

Nurseries
Intensive care unit
Dialysis unit
Organ transplant unit
Burns unit
Operation theatres
Delivery rooms
Post-operative wards

Patient factors

Extreme age
Primary ailments complicated by other associated diseases
Diminished body resistance use to immunosuppressive drugs
Indiscriminate use of antibiotics and steroids
Longer patient exposure through complicated and lengthy operative procedures.

HOSPITAL INFECTION CONTROL PROGRAMME

The main aim of the infection control programme is to lower the risk of an infection during the period of hospitalization.

The three main areas for the infection control programme are as follows

1. Development of surveillance system
Surveillance implies that the observed data are

regularly analyzed and reported to those who are in position to take appropriate actions. The surveillance system will establish a database, which will give endemic rates of Nosocomial infection.

2. Development of policies and procedures
These policies and procedure are useful in decreasing the risk of Hospital infection
3. Continuing medical programme
The medical and paramedical staffs are enrolled in the CME for the updated knowledge in Hospital infection.

Basic elements of the infection control programme

1. Providing a system of identification and reporting of infection.
2. Providing a system for keeping records of infection in patients and personnel.
3. Providing for good hygiene, aseptic techniques and sterilization and disinfection practices.
4. Providing the staff, orientation and CME in infection prevention and control
5. Providing for coordination with all departments and with medical audit committee in quality assurance.

Infection control committee

The infection control committee will have the responsibility of monitoring the occurrence of Hospital infection and recommending corrective action.

It is made up of the representatives of various clinical and other disciplines. It is important for the members to devote enough time for the programme.

Role and functions of the ICC

1. Determine the method of surveillance and reporting
2. Determine the criteria for reporting of infections
3. Review occurrence of clusters of infections
4. Review of records of all infected patients
5. Review with the medical audit committee the use of antibiotics and anti infectives.
6. Recommendation in relation to selection of equipment used for sterilization
7. Development of forms or data sheets used for collecting and reporting of data for the infection control programme
8. Prepare and update procedure manuals of aseptic techniques used in the hospital
9. Determine the policy on screening and immunization of hospital staff
10. Determine the content and methodology of training programme for hospital staff in prevention and control of Hospital infection.

Effective control measures

- 1) **People** The people in the hospital are significant carriers. The most important factor is the failure of hospital staff to wash their hands often enough between patients to prevent spread of cross infections. Adequate hand washing facilities must be available in all areas.
- 2) **Aseptic techniques** Strict adherence to aseptic techniques even while the procedures are done outside of the operation theatres.
- 3) **Segregation of contaminated materials and instruments** There must be a system for keeping the contaminated pieces of linen, sputum cups, bedpans and similar items separately to minimize the chances of getting mixed up with the clean ones. The same applies to the instruments.
- 4) **Dis-infection practices** Selection of appropriate disinfectants for different purposes is important.
- 5) The following should be checked:
 - a) Appropriate choice
 - b) Appropriate concentration
 - c) Appropriate contact time
 - d) Appropriate method of use
- 6) **Sterilization practices** An efficient central sterilization department ensures supply of properly sterilized articles to all the users of the hospital. Sterilization in flash sterilizer's in the OT must be done meticulously by a trained person.
- 7) **Good housekeeping** Cleaning of OT walls, floors, tables and fixtures should be organized as a scheduled programme at predetermined intervals and use of appropriate disinfectants is strongly advocated.
- 8) **Antibiotic policy** Use of antibiotics must be monitored and controlled. The major problem in involvement of organisms showing multi-drug resistance.
- 9) **Careful handling of soiled linen** All soiled linen should be considered as potentially infected and treated accordingly
- 10) **Air hygiene in operation theatres** Clogging of air filters of the air conditioning system renders the ventilation in OT ineffective. The filters should be frequently cleaned. The AC system must achieve the desirable number of air changes per hour.
- 11) **Developing sense of awareness** This is the single most important factor in the control of Hospital infection. A high sense of awareness and training goes a long way in controlling Hospital infection.