Preventing nosocomial infections

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ABSTRACT

Nosocomial (hospital acquired) infection is an infection originating in a patient while in the hospital or utilizing other health care facility. It denotes a new disorder (unrelated to the patient's primary condition) associated with being in a hospital, that is, it was not present or incubating at the time of admission or the residual of an infection acquired during a previous admission. It includes infections acquired in the hospital but appearing after discharge, and also such infections among the staff of the faculty. Examples include infection of surgical wounds, hepatitis B and urinary tract infections.

Introduction

Clinicians are concerned mainly with the procedures for sterilization, for the effective decontamination of spillage, surfaces, equipments after use, for the disinfection of contaminated materials before their safe disposal from the laboratory. For this it is advised to have adequacy of sterilization and disinfection in the surgical or medical practice and may be called upon to test the efficacy of these processes in the lab.

Many patients, who visit hospitals, acquire an infection that was neither present nor in the prodormal (incubation) stage when they entered the hospital. They are the victims of nosocomial (hospital-acquired) infections. Treatment of nosocomial infections not only costs to economic part, but also to the health. In addition, many of these infections may lead to the death of patient or at minimum, additional complications may occur. In addition to patients, health care workers are also at the risk of acquiring infections.

Factors Responsible for Nosocomial Infection

The three principle factors that determine the likelihood that the patient will acquire a nosocomial infection are:
1. Susceptibility of the patient to the infection.
2. The virulence of the infecting micro-organism.
3. The nature of the patient's exposure to the infecting micro-organism.

Role of Micro-organisms

Microorganisms spread in hospitals through several modes [1-3]:

1. Direct contact, for example, by contaminated food or intravenous solutions.
2. Indirect contact, for example, from patient to patient by the hands of health care workers (MRSA, rotavirus)
3. Droplet contact, for example, inhalation of droplets (>5um in diameter) that cannot travel more than 3 feet (Pertusis)
4. Airborne contact, for example inhalation of droplets (< 5 m) that can travel large distances on air currents (Tuberculosis)
5. Vector-borne contact, for example, disease spread by vectors, such as mosquitoes (malaria) or rats (rat bite fever); this mode of transmission is rare in hospitals in developed countries.

Once the reservoir is known, the infection control practitioner can implement control measures, such as re-education regarding hand washing (in the case of spread by health care workers) or hyper-chlorination of cooling towers.

Techniques for Preventing Nosocomial Infections Include[4-5]

1. Segregation of the infected patients.
2. Wearing of masks, gowns, gloves, eye protection or face shield when caring for infected patients.
3. Bagging of contaminated articles, such as bed lines, when removed from the room.
4. Cleaning of all isolation rooms after the patient is discharged.
5. Precautions in handling of the blood & body fluid
6. HCWs should take care to prevent the injuries when using needles, scalpels, and other sharp instruments or devices.
7. HCWs should use equipment, such as mouthpieces and resuscitation bags, instead of mouth-to mouth resuscitation.
8. HCWs should refrain from handling patient care equipment if they have exudative lesions or weeping dermatitis.
9. Hospitals should ensure that the reusable equipment is properly sterilized.

10. Hospitals should ensure that the single-use items are discarded properly.
11. HCWs should wash hands with a special antimicrobial agent or a waterless antiseptic agent.

Surveillance Culture

Most routine environmental cultures in the hospital are now considered to be of little use and should not be performed unless there are specific epidemiologic reasons. However, certain surveillance cultures should be performed as a method of limiting outbreaks. A better approach is for the infection control team to monitor patients for the development of nosocomial infections that might be related to the use of contaminated commercial products. However, most often, such infections are actually caused by in-use contamination, rather than contamination during the manufacturing process.[1,5,6]

All steam and dry-heat sterilizers and ethylene oxide gas sterilizers should be checked at least once in a week with a liquid spore suspension.

Recently, the US Pharmacopeia published requirements for monitoring of sterile compounding in hospital pharmacies. The laminar flow hoods, biological safety cabinets, clean rooms, and donning areas must be monitored weekly or monthly so that intravenous or intrathecal products and drugs used in the operating room are made (compounded) under sterile conditions.

Discussion

Corticosteroids, cancer chemotherapeutic agents, and antimicrobial agents all contribute to the likelihood of nosocomial infection by suppressing the Immune System or altering the hosts normal flora to that of resistant hospital microbes.

It is not possible to immunize patients against infection. The disease may spread noscomially by either direct contact, contact with contaminated food, water, medications, medical devices or by airborne transmission.

Thus nosocomial infection can never be completely eliminated but only controlled.

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