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Hospital infections - medical, legal, economic and ethical issues

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Summary: The aim is to present factors that threaten the health and life of the patient staying in a hospital setting. Objects and tools that, as a result of human error, penetrate the patient's tissues and body cavities, cause a high risk of infection. These include surgical instruments, gynecological instruments, needles, syringes, catheters, and dressings. The requirements for the cleanliness of equipment, objects and tools are manifold, depending on the degree of risk of infection. The sterility of the equipment and tools is maintained thanks to the proper handling of the material before sterilization, properly carried out sterilization process, compliance with transport and storage rules. Analysis of deactivation conditions and assessment of its effectiveness provides a guarantee of prevention of nosocomial infections [4] .

Keywords: hospital infections , pollution, source of infection,

Introduction

Hospital infections is currently an issue that is of interest to many medical environments as well non-medical . Understanding the problem that connecting with these issues requires getting acquainted with the subject of scope of epidemiology, infectious diseases , microbiology, finance and administration. Currently, the control of nosocomial infections is recognized by the hospital as the most important criterion for quality of work. However, it should be noted that this is a problem that is still underestimated in our country . It can be said that it is a reliable, professional preparation of professional staff [7] .

The fight against nosocomial infections continued and is currently very slow. It is a place away by education - and pointed to admit that the problem is difficult and brings little effect. Persistent and substantive education allows to achieve appropriate knowledge in this area, to achieve success, knowledge should be supported by appropriate practice and it is supported by an iron consequence.

What are hospital infections?

Of the many different diseases that have one thing in common - a specific connection to the hospital environment. The clinical picture is multiple , with the same set of symptoms or disease being caused by different microorganisms from multiple sources and disseminated by different routes.

Infection is often considered as hospital if it occurred within 48 - 72 hours of providing a health service. For an infection with a long incubation time (eg hepatitis B, hepatitis C, HIV , tuberculosis) a period of two weeks to many years is assumed. Hospital infection can affect both the patient and the staff. It can occur both in a hospital and in another healthcare facility [11] .

What is the hospital special?

The hospital is a complex ecosystem meters, whose main elements are dances: people, microbes and environment.

Elements are a close, dynamic relationship to each other .

They are in the hospital:

- deposite patients

- with idiopathic and / or iatrogenic immune disorders,
- infected asymptotically and symptomatically,
- subjected to numerous, invasive medical procedures,

- specific microorganisms

- adversely changing their features under the influence of numerous antibiotics and disinfectants,
- from other hospitals,
- **special environment**
- cluster of sick, infected and personnel,
- equipped with complicated apparatus, difficult to sterilize or disinfect,
- equipped with devices used by groups of people,
- intended for conducting multiple activities (medical, hotel, order, educational etc.).

Hospital infections have a long history. Inherent in the hospital, they were, are and will be present in it . An important fact is their number and effects. At the end of the 20th century in the 1970s they were a serious public health problem and the following people (directors of facilities, chiefs, patients themselves) around the world, including Poland. The reasons for this fact should be sought in:

- development of invasive diagnostic and therapeutic techniques,
- the emergence of new diseases,
- uncontrolled abuse of antibiotics,
- disregarding the rules of hospital hygiene.

Hospital infections

This is an infection that occurred in the hospital, was revealed during hospitalization (minimum 48 hours after admission) or after discharging the patient and was caused by **epidemiologically** documented **disease** agent from another patient or hospital staff or endogenous microbiological factor [1] .

Hospital infections occur at a fixed frequency characteristic of the ward (**endemic**) or appear rapidly as an outbreak (**epidemic**).

The main hospital infections otherwise **exogenous** (cross) have a source in the transfer of an infectious agent in the patient with another patient, or a person with staff from the hospital environment; **endogenous** hospital infections are caused by the patient's own microflora (pathological or opportunistic).

Hospital infection once meant only related to the hospitalization of a given patient. The development of medicine has led to the fact that the time of typical hospitalization is much shorter, there are also more and more institutions of long-term care, which are not hospitals

and more and more invasive medical procedures not performed in hospitals but in outpatient settings. As a result, there are two trends or the concept of a hospital infection is spreading to infections associated with such situations, or a wider concept of "infection associated with the provision of health services" is introduced. In Poland, the notion of a plant infection also appeared, which in theory was supposed to correspond to infections associated with the provision of health services, but for the change also had other disadvantages associated with the fact that not all institutions providing health services are health care facilities [2] . Currently, in accordance with the Act, the term "hospital infection" and defined as "infection related to the provision of health services" apply.

Forms of nosocomial infections, the following stand out:

- respiratory tract infection ,
- urinary tract infection ,
- local infections,
- surgical wounds infection ,
- for virus infections ,
- sepsis, etc.

The functioning of the infection control team is regulated by legal acts. Mainly the Act of December 5, 2008 on the prevention and control of infections and infectious diseases in humans. The act on infectious diseases and infections puts the obligation on physicians to report nosocomial infections or deaths due to them occur as clinical syndromes (infectious lung diseases, sepsis, neuroinfections, food poisoning) or diseases with established etiological factors (eg mycoses, zoonoses, meningococcal infections, etc.) [5] .

The same legal act in art. 10, 11 and 12 obliges heads of health care facilities and persons performing medical professions outside of them to ensure compliance with hygiene and health requirements, including health care units - to develop, implement and monitor measures to prevent nosocomial infections (together with the creation of a team and a workplace infection control committee) and keeping registers of plant infections and pathogenic microorganisms with specific resistance, including multidrug) [8] .

The epidemic process in nosocomial infections:

I. Source of infection

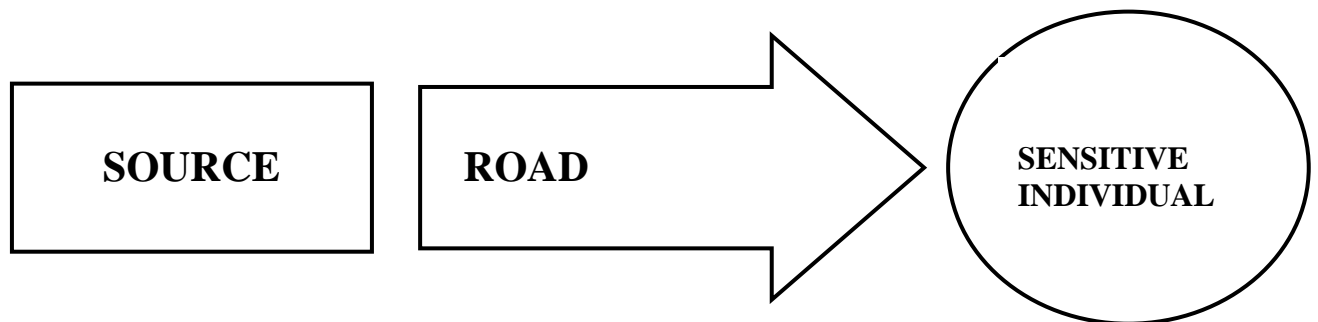
- patient ,
- staff,
- hospital environment (tools, equipment, air),
- visitors.

II. The ways of spreading

- contact, (including through violation of tissue continuity) ,
- oral,
- aerial .

III. A sensitive population

- patient ,
- staff,
- visitors.



- patient

- staff

- (hands, clothing, inhalation)

food

- medical instruments

- hospital environment

- contact

- air-droplet

- visitors

- patient

- employee

-

Potential causes of environmental nosocomial infections :

- dirty hands of medical staff ,
- contaminated work clothes medical personnel,
- non-sterile medical equipment,
- unheated non-medical equipment and contaminated patient environment,
- not suitable cleaning ,
- inadequate division of labor,
- - engaging unprepared persons, especially in special situations,
- - "borrowing" of staff from other branches,
- - lack of procedures and standards
- poor working conditions
- - heavy staff load,
- - excessive occupancy,
- - introducing new requirements without training , preparation and training,
- receiving patients who require special conditions of hospitalization
- ability to provide these conditions,
- poor sanitary and hygienic conditions of the outlets,
- - lack of procedures and standards
- no infection control system in the facility
 - lack of procedures and standards,
 - lack of professional people ,

Standard it is a standard, normative, norm, parity

Procedure it is a procedure , a mode

Microbiological purity categories equipment (tools medical personnel and hands and nnych employees)

- the following breakdown distinguishes because of its purpose :

I. Critical - sterile equipment (sterile)

- violation of skin and tissue continuity ,
- damaged mucous membranes ,
- mucosa with a sterile foundation .

Tools and hands should be sterile, which means they are free from bacteria, viruses, fungi and spores.

II. Semi-critical - sanitized equipment (after disinfection)

- undamaged non-sterile mucous membranes ,
- skin with microdamages,

III. Non-critical - decontaminated equipment (after disinfection) [3].

The main elements of hospital infection control :

I. Anti-epidemic activities

- unprotect the source of infection and cut roads that spread infections
- disinfection ,
- insulation,
- sterilization ,
- therapy .
- resistance of the sensitive population
- protective vaccinations,
- passive immunity ,
- knowledge.
- monitoring the epidemiological situation of the given facility
- antibiotic consumption,
- Microbiological testing,
- registration of suspicions and cases of nosocomial infections.

II . Activity of the Hospital Infection Control Team

- formulating procedures,
- introduction of procedures and standards ,
- monitoring ,
- training of the medical team ,
- consulting,

PREVENTION OF INFECTIONS =

TEAM ACTION

✓ Epidemiologist

✓	Epidemiological nurse
✓	Clinic doctor
✓	microbiologist
✓	sanitarian
✓	Pharmacologist
✓	Economist
✓	Managing

The most common mistakes made:

1. in hand hygiene:

- incorrect nail condition (too long, lacquered , artificial),
- covering your forearm with clothing,
- permanent wearing of jewelry, watches, bracelets, rings,
- too rare hand washing,
- inaccurate hand washing,
- not to wash your hands before and after removing your gloves,
- using unsuitable means and utensils for washing hands,
- improper equipment of the hand washing station,
- insufficient care of hands and nails .

2. in the use of work and protective clothing

- wearing your own clothing at the workplace ,
- wearing or working clothes with a long sleeve that overlaps your hands ,
- rare use of protective clothing,
- use of dirty protective clothing,
- wearing a few days and / or dirty work clothes,
- self-transport and self-cleaning of clothes protective,
- rare use of hats and masks,
- not appropriate use of masks and hats:
 - without covering the nose,
 - be with a full coverage of hair and earrings,
 - wearing the same hats and masks for a few days or dirty, wet,

- no disinfection of corrective or protective glasses,
- wearing gloves between treatments,
- improper removal of protective clothing [6] .

3. in disinfection:

- wrong choice of disinfectant that does not work on microorganisms that cause pesticide in a given case (quite a large part products available on the market do not affect fungal spores, viruses, bacterial spores and oocysts),
- applying an appropriate agent, but a too low concentration (often caused by excessive thi t is the economy or dishonest staff)
 - shortening the operating time of the disinfectant (rush and carelessness),
- using a solution with too low or too high temperature (some oxidizing preparations completely decompose at high temperatures, when agents belonging to other chemical groups may show better effectiveness under such conditions),
- bad cleaning of the surface before decontamination, the consequence is the presence of organic substances inactivating practically all disinfectants,
- incomplete immersion tools or application agent to the surface,
- Do not correct that before rinsing detergents and disinfection lead to inactivation of the disinfecting fresh soaps, detergents and inappropriate pH,
- failure to take into account the fact that some decontamination preparations are inactivated by plastics ,
- using too hard water to prepare working solutions,
- contamination of the surface after disinfection during rinsing disinfectants with water of poor microbiological quality,
- contamination of surfaces or tools in non-aseptic procedures [10] .

4. in sterilization:

- do not take sterilization,
- resignation from initial washing and disinfection,
- no monitoring (documentation) of the sterilization process ,
- a large number of tools in packaging,
- re-sterilization of disposable equipment,
- using packages that have been damaged or wet packaging,
- using expired equipment [2] .

5. in cleaning:

- in solving one cloth or mop to all the rooms or areas
- using a small amount of water,
- no water exchange and thus the use of dirty water,
- in solving insufficient or improper washing and disinfecting agent.
- not following the order in cleaning the surface,
 - dry cleaning - spreading of pollutants,
 - storage of wet cleaning sets in a standing position,
- lack of preliminary disinfection of biological material (blood, excrement) on the surface,
- inaccurate surface cleaning and disinfection,
 - use cleaning to "feel" instead of implementing procedures to maintain cleanliness.

Prevention of infections inside the hospital

In-hospital infection is the most common cause of complications in patients after surgery. Prevention of nosocomial infections in the nurse's work is mainly about observing the principles of care treatment, guaranteeing the prevention of complications and reducing their occurrence.

In hospitals, mainly on infectious and surgical districts, conditions conducive to the penetration of germinal microorganisms into the patient's body. The source are: hospitalized patients with infections, and carriers of pathogenic environment.

Transmission of the bacteria is effected by direct contact with other ego of human beings as well jakymi surrounds the objects. The activity of pathogenic microorganisms and increasing susceptibility to infection and the propagation of bacteria is also supported by medical measures such as: parenteral nutrition , drainage of body cavities, catheterization of large vessels, urinary bladder, space and extracorporeal drainage , use of respirators .

Intensive care units have an increased risk of infections even ten times higher than in other departments. Mainly in infections caused by bacteria wnątrzzspitalne, positive Gram-negative staphylococcal strains, and [9].

The most important and basic activities aimed at preventing the occurrence of nosocomial infections include [12] :

- Adheres to the principles of hygiene, asepsis and antisepsis:
- Thorough surgical care of the hands on the operating block before each operation and

procedure ,

- Using sterile gloves and clothing before surgery,
- Using hygienic gloves when performing activities at the patient,
- Caring for patients' personal hygiene and their own ,
- Before performing the procedure, wash your hands hygienically,
- Using face masks and hairpins before surgery,
- Use only sterile equipment on the operating unit .

Application of principles and techniques of nursing procedures from aseptic group:

- frequent observation of injection sites, drains, catheters, observation of wounds and dressings, care for the cleanliness of catheters, rinsing venforms,
- everyday and frequent dressing change,
- using sterile tools and during changing the dressing on the post-surgical wound,
- careful cleansing and disinfection of wounds,
- proper preparation of the patient for surgery (aseptic bathing of the whole body, shaving the operating site),
- respectful isolation and segregation of patients to prevent the spread of infections within departmental and in- hospital,
- applying rules and procedures in improving the patient,

- proper care of intubated patients,
- for borderline health assessment of nurses, assessment of the state of immunity,
- the use of vaccinations that protect the nurse against illnesses infectious,
- documenting injuries and stabs of medical personnel.

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