

ANTISEPTIC AND ASEPTIC

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Abstract:

Antisepsis implies a set of measures aimed at destroying microbes on the skin, in a wound, a pathological formation or the body as a whole. There are physical, mechanical, chemical and biological antisepsis

Keywords: microbe, infection, pus, organism, vaccine, air, wound.

Introduction

Asepsis is a method of surgical work that prevents microbes from entering the surgical wound or developing in it. There are bacteria on all objects around a person, in the air, in the water, on the surface of his body, in the contents of internal organs, etc. Therefore, surgical work requires compliance with the basic law of asepsis, which is formulated as follows: everything that comes into contact with the wound must be free of bacteria, i.e. sterile.

Antisepsis involves a set of measures aimed at destroying microbes on the skin, in a wound, a pathological formation or the body as a whole. There are physical, mechanical, chemical and biological antisepsis.

Physical antisepsis ensures the outflow of infected contents from the wound and thereby cleanses it of microbes, toxins and tissue decay products. This is achieved by the use of gauze tampons, drains made of rubber, glass, and plastic. The hygroscopic properties of gauze are significantly enhanced when it is moistened with hypertonic solutions (5-10% sodium chloride solution, 20-40% sugar solution, etc.).

Open wound treatment methods are used without applying a bandage, which leads to the drying of the wound with air and thus creating unfavorable conditions for the development of microbes. Physical antisepsis also includes the use of ultrasound, laser beams, and physiotherapeutic procedures.

Mechanical antisepsis is a technique for removing infected and non-viable tissues from the wound, which serve as the main nutrient medium for microorganisms. These are operations called active surgical debridement of the wound, as well as wound toileting. They are of great importance for the prevention of wound infection.

Chemical antisepsis includes substances with bactericidal or bacteriostatic action (for example, sulfa drugs) that have a detrimental effect on the microflora.

Biological antisepsis consists of a large group of drugs and techniques, the action of which is directed directly against a microbial cell and its toxins, and a group of substances acting indirectly through the human body. Thus, the microbe or its toxins are predominantly affected by: 1) antibiotics - substances with pronounced bacteriostatic or bactericidal properties; 2) bacteriophages; 3) antitoxins, usually administered in the form of serums (anti-tetanus, anti-diphtheria, etc.).

Vaccines, toxoids, blood and plasma transfusions, the introduction of immune globulins, methylthiouracil preparations, etc., act indirectly through the body, increasing its immunity and thereby enhancing its protective properties.

Proteolytic enzymes lyse dead and non-viable tissues, promote rapid wound cleansing, and deprive microbial cells of nutrients. According to observations, these enzymes, by changing the habitat of microbes and destroying their shell, can make the microbial cell more sensitive to antibiotics.

Biological antisepsis involves the use of means of biological origin, as well as the effect on the immune system of the macroorganism. We have an inhibiting effect on microbes and a stimulating effect on the immune system. The largest group of agents of biological origin are antibiotics, as a rule, these are the waste products of fungi of various species. Some of them are used unchanged, some are subjected to additional chemical treatment (semi-synthetic drugs), there are also synthetic antibiotics. Antibiotics are divided into various groups, especially the penicillin group, proposed in the 1930s by Fleming, and in our country this drug was synthesized by the group of Academician Ermolyeva. The introduction of penicillin into medical practice caused a revolution in medicine. That is, diseases that were fatal for humans, for example, pneumonia, from which millions of people died around the world, began to respond to successful treatment. In surgery, purulent complications have become much less common. However, the improper use of penicillin for 20 years led to the fact that in the 1950s the doctors themselves completely compromised it. This was because the strict indications for the use of penicillin were not taken into account; Penicillin was prescribed for influenza, to avoid complications - pneumonia caused by staphylococci or pneumococci. Or surgeons, performing surgery for an inguinal hernia, prescribed antibiotics to avoid purulent complications. Currently, antibiotics cannot be used for prophylactic purposes, except in cases of emergency prophylaxis. The second circumstance is that it was prescribed in low doses. As a result, not all microbes were exposed to penicillin, and the microbes that survived penicillin began to develop defense mechanisms. The most well-known defense mechanism is the production of penicillinase, an enzyme that breaks down penicillin. This property is characteristic of staphylococci. Microbes began to incorporate tetracycline antibiotics into their metabolic cycle. Strains have developed that are able to live only in the presence of these antibiotics. Some microbes have rearranged the receptors of their cell membranes in such a way that they do not perceive antibiotic molecules.

ASEPTIC is a set of preventive surgical measures aimed at preventing infection from entering the wound. This can be achieved by sterilizing everything that comes into contact with it. Asepsis was suggested by the German surgeon Bergmann. This happened at the 9th Congress of Surgeons in Berlin. Bergman proposed physical methods of disinfection - boiling, roasting, autoclaving.

Asepsis and antisepsis are a single set of measures, they cannot be separated.

According to the source of infection, they are divided into exogenous and endogenous. Routes of endogenous infection: lymphogenic, hematogenic, intercellular spaces, especially loose tissue, contact (for example, with a surgical instrument). For surgeons, endogenous infection is not a particular problem, unlike exogenous infection. Depending on the route of penetration, exogenous infection is divided into airborne droplet, contact and implantation. Airborne infection: So there are not many microbes in the air, the probability of airborne contamination is not high. Dust increases the likelihood of contamination occurring from the air. Basically, measures to control airborne infections are limited to dust control and include ventilation and ultraviolet irradiation. Cleaning is used to control dust. There are 4 types of cleaning:

1. Preliminary is that from the morning to the beginning of the operating day, all horizontal surfaces are wiped with a napkin moistened with a 0.5% chloramine solution.

2. Routine cleaning is done during the operation and consists in the fact that everything that falls on the floor is immediately removed

3. The final cleaning is after the operating day and consists of washing the floors and all equipment with a 0.5% chloramine solution and turning on ultraviolet lamps. It is impossible to sterilize the air with the help of such lamps, and they are used in the place of the greatest sources of infection.

4. Ventilation is a very effective method - after it, microbial contamination drops by 70-80%. For a very long time, it was believed that airborne infection was not dangerous during operations, but with the development of transplantation with the use of immunosuppressants, operating rooms began to be divided into 3 classes:

1. First class - no more than 300 microbial cells in 1 cubic meter of air.

2. Second class - up to 120 microbial cells - this class is designed for cardiovascular surgeries.

3. The third class - the class of absolute asepsis - no more than 5 microbial cells in a cubic meter of air. This can be achieved in an airtight operating room, with ventilation and sterilization of air, with the creation of a high-pressure zone inside the operating room (so that air rushes from the operating rooms to the outside). Special gateway doors are also installed.

Droplet infections are those bacteria that can be released into the air from the respiratory tract of everyone in the operating room. Microbes are excreted from the respiratory tract with water vapor, water vapor condenses and together with these droplets, microbes can enter the wound. To reduce the danger of spreading a droplet infection, there should be no unnecessary conversations in the operating room. Surgeons should use 4-layer masks, which reduce the chance of droplet infection by 95%.

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