FEATURES OF INFECTION CONTROL MEASURES IN MEDICAL LABORATORIES

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Introduction. Infection control is a set of organizational, preventive and anti-epidemiological measures aimed at preventing the occurrence and spread of infectious diseases in the hospital.

Infectious diseases that are associated with the provision of medical care occur in all countries, regardless of their social and material and technical development. They affect patients, medical workers and visitors to health care facilities.

Materials and methods. Analysis and generalization of modern Orders of the Ministry of Health, Guidelines on infection control and scientific literature data.

Results and their discussion. The source of these infectious diseases can be people who are in health care facilities, in some cases they are caused by the use of medical equipment or procedures, or arise as a result of the transmission of non-hospital infections to patients who are in health care facilities. Sometimes health care institutions act as a "breeding ground" of infection, which leads to its spread both within the institution itself and outside its borders among the population. Infectious diseases associated with the provision of medical care can lead to severe forms of the disease, an increase in the length of stay of patients in the hospital, the depletion of health care resources, and to deaths, which is especially relevant in the context of the COVID-19 pandemic.

Medical laboratory personnel are also exposed to the occupational risk of infection with pathogenic microorganisms that can cause various infections. Laboratory infections are any infections associated with work in the laboratory, regardless of the nature of their course. To date, laboratory safety programs have been developed in developed countries. Despite long-standing practical recommendations, laboratory infections continue to be recorded, which is probably due to the lack of appropriate instructions and / or low compliance of personnel with laboratory safety rules. The emergence of new (Coronavirus) and the return of old pathogens (HIV, hepatitis C virus and multi-resistant strains of mycobacterium tuberculosis) have increased compliance with the rules of safe work in the laboratory.

All biological safety programs consist of recommendations on laboratory practice, laboratory design, use of personal protective equipment and safe equipment.

Practical recommendations for biological safety:

– in the laboratory, it is always necessary to observe precautionary measures when working with blood and body fluids;

– all containers and containers intended for disinfection or removal of used materials and tools must be clearly marked;

– tools and equipment are subjected to disinfection and sterilization treatment immediately after use;

– sharp and prickly objects are stored in specially designed security containers, which must be emptied in a timely manner;

– laboratory personnel are obliged to keep their workplace clean and orderly;

–the serviceability of work equipment, machinery and other devices must be constantly checked;

– eating at the workplace is prohibited;

– food products cannot be stored in refrigerating chambers, which are used to store clinical material;

– working surfaces should be disinfected daily and when necessary (in case of accidental contact with biological material);

–regular cleaning of the laboratory premises with subsequent disinfection is recommended using hospital disinfectants effective against viruses. In the event of a shortage of hospital disinfectants, surfaces can be disinfected with 0.05% sodium hypochlorite (1:100 solution when using household bleach at an initial concentration of 5%) after cleaning with a neutral detergent. Surfaces for which the use of sodium hypochlorite is not allowed can be cleaned with a neutral detergent followed by treatment with a 70% ethanol solution;

– overalls must be worn only in designated areas; outside the main premises - it is forbidden to wear overalls;

–work clothes are stored in specially designated individual cabinets separately from everyday clothes and personal items of employees;

– protective gloves must be worn if there is to be manipulation related to direct or accidental contact with blood or other biological media, as well as when handling items and objects contaminated with blood or other potentially dangerous biomaterials ;

–it is recommended to wash hands after each performed procedure and at the end of the work shift;

–thorough washing of hands with ordinary soap for 10 seconds leads to the removal of almost all transient gram (-) bacteria from the surface of the skin and is currently the most effective way to reduce the number of bacteria on the surface of the skin;

– it is recommended to use protective glasses in order to protect the face and eyes from splashes of contaminated biological material, as well as from ultraviolet radiation;

– the relevant Standard Operating Procedures of the laboratory should describe procedures aimed at preventing the risk of developing laboratory infections among medical personnel.

Conclusions. Prevention of the spread of dangerous biological agents is possible with strict adherence to standard rules of work in medical laboratories and manipulation techniques in combination with the use of primary (safe equipment) and secondary barriers (special laboratory design).

USE OF THE SECRETOME OF MESENCHYMAL STEM CELLS IN PHARMACEUTICAL BIOTECHNOLOGY

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The modern pharmaceutical industry is based more on advances in biotechnology than in chemical synthesis. Many processes, from the microbial synthesis of antibiotics, vitamins and recombinant proteins to the production of monoclonal antibodies and regenerative medicine, are associated with the cultivation of cells and the use of these cells or their metabolic products as therapeutic agents.

The last decades using of living cells of both prokaryotes and eukaryotes in treatment has become increasingly common. So, in particular, a team of researchers led by Rocco Mazzolini created a transgenic strain of *Mycoplasma pneumoniae* for the treatment of pneumonia caused by *Pseudomonas aeruginosa*. The administration of a living microorganism makes it possible to overcome the protective biofilm of a pathogenic bacterium and kill it with an antimicrobial agent.

Mesenchymal stem cells (MSCs) – species or individual – are the most frequent objects of pharmaceutical biotechnology among eukaryotic cells. Drugs based on these cells are being developed. Morgan T. Sutton et al. showed that MSCs are able to produce *in vitro* substances that exhibit antimicrobial activity against *Pseudomonas aeruginosa*, *Staphylococcus aureus*, and *Streptococcus pneumoniae*. However, mesenchymal stem cells are rarely used as antimicrobial agents. They have four important properties that find applications in regenerative medicine: MSCs stimulate tissue regeneration, reduce inflammation, scarring, and modulate the immune system.

The use of living cells carries a number of risks associated with their potential transformation. Bacterial cells can acquire pathogenic properties, and