The Use of Simple Antiseptics and Disinfectants to Prevent Viral Infections

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ABSTRACT

The given article provides insights into infections, viruses, and antiseptics and disinfectants, as well as chemicals that have antimicrobial effects. In addition, this article elucidates the methods of preparation of the chemicals with antiseptic and disinfectant properties which are widely used as antiseptics and disinfectants, easy to obtain and prepare, inexpensive, simple, popular, harmless, also has strong anti-parasitic effect, against various viral infectious diseases in the prevention and eradication of various viral infectious diseases.

Keywords: Infection, virus, antiseptic, disinfectant, parasites, ethanol, hydrogen peroxide, iodine, potassium permanganate, flavoring.

Theoretical part

Nowadays, the avoidance and elimination of various viral infectious diseases, legally the concept of epidemiology, studying the laws governing the emergence, spread, and cessation of infectious diseases among humans and developing preventive measures against them have become one of the serious problems.

The interaction of a macroorganism with a pathogenic microorganism under certain external and social environmental conditions is called an infectious process. An "infection" means its passing on the body, it manifests itself as a disease or as a carrier of infection. The onset of infectious disease is associated with impairment of physiological functions, then it comes out with a number of clinical symptoms after reaching a certain level.

The specificity of pathogens, the degree of their pathogenicity, the amount of microorganisms corresponding to the macroorganism, the resistance of the macroorganism and the level of specific immunity are reflected in the diversity of clinical signs of infection.

In the spread of infection, the sick person comes first. It is the most dangerous source of infection because it spreads a large number of pathogens. At different stages of the disease, it poses an unequal risk to those around it.

The method of excretion of pathogens from the infected organism depends on the location of the pathogens in the patient or the organism which carries the infection. If the pathogen is located in the mucous membranes of the respiratory tract (influenza, measles, whooping cough), it can be transmitted through airborne or pharyngeal mucus droplets. If the causative agent is in the intestine (diarrhea), it is spread by the

patient's faeces, if the causative agent is in the blood, it spreads through the blood-sucking arthropods.

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The presence of pathogens outside the body is associated with various objects in the external environment. The method of excretion of pathogens from the organism adapts to the nature of the objects of the external environment. For example, the pathogen released from the intestines falls into the soil, underwear, surrounding objects, water, and the pathogens released from the respiratory organs spread into the air.

Therefore, the elements of the external environment that allow the transmission of pathogens from one organism to another are called infectious agents [1,2].

Viruses are very small microorganisms that also pass through bacterial filters. They multiply at the expense of the protein-synthesizing matter in the cells. These viruses are divided into groups that contain RNA and DNA. Choosing and creating drugs that affect viruses is a very difficult task. But there are drugs that affect certain types of viruses. One group of these drugs is used to prevent viral diseases and the other to treat them. Antiviral drugs are divided into the following 5 groups according to the influence mechanism:

1. Drugs that have an effect against the adhesion and entry of viruses into the cell and the release of viral genomes from them. 3. Drugs that affect against th synthesis of nucleic acids, that is to say DNA and RNA. 4. Drugs that interfere with the location of vibrios.

The use of antiseptics and disinfectants against various viral infectious microbes has great importance. Antiseptic is derived from the Greek word, "anti" means "against", "septic" means "rot". Disinfection is derived from the words that "dez" means "to destroy", "infetsere" - "to infect".

Antiseptics and disinfectants are substances that have antimicrobial effects and differ in part in the strength of the effect and the method of application. Antiseptic and disinfectant are drugs which belong to these two groups, have a general antimicrobial pharmacological influence, do not select to effect, are against chemotherapeutic agents depending on the types of macroorganisms.

Antiseptics are matters used to eliminate the microorganisms on the surface of the body (skin, mucous membranes), cavities, and they have bacteriostatic and bactericidal properties. The bacteriostatic effect stops the growth of microbes without killing them.

Disinfectants are those used to kill microorganisms in the external environment (patient's clothes, belongings, room, etc.) and can be used simultaneously as antiseptics and disinfectants. Because they are used as an antiseptic - in small concentrations, as a disinfectant - in large concentrations.

Antiseptics and disinfectants are also used in antimicrobial surgery and in the practice of struggling with infectious diseases. It is also important to find and put into practice new chemicals that are effective against such microbes [3,4,5].

Antiseptic and disinfectant drugs should have a high antimicrobial effect, should not have a local tickling or burning effect on the tissues. At present, antiseptics and disinfectants are widely used in medical practice.

The first case of pneumonia caused by a coronavirus infection in the world was first appeared in December 2019 by locals associated with the Huanan Animal and Seafood Market in Wuhan, Hubei Province, People's Republic of China [3].

The properties of the new coronavirus are currently being studied in many laboratories around the world. Scientists have identified a pathogen that has been named Covid-2019.

It is also important in finding and implementing new antimicrobial-effective chemicals [3,4,5].

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The first case of coronavirus pneumonia in the world was first reported in December 2019 in Huanan, an animal and seafood market in Wuhan, Hubei Province, China.

The properties of the new coronavirus are currently being studied in many laboratories around the world. As a result of scientific researchs, the pathogen was found and that virus was named "2019-n CoV" or Covid-19.

It should also be noted that the disease is transmitted from a patient to a healthy person through airborne droplets and domestic contact. A person infected with the virus may experience general weakness, colds, coughs, headaches, sore throats, and fever. The beginning of the disease starts in a state similar to the symptoms of colds and flu. But there are also specific symptoms of this disease. High fever, dry cough, difficulty breathing, discharges from the upper respiratory tract (phlegm, runny nose), headache, fatigue, muscle aches, fever, general weakness. These conditions are typical symptoms of coronavirus infection. The coronavirus can infect people of all ages. The individuals who are older, chronically ill, has immunodeficiency may be more likely to experience the disease [6,7].

Symptoms of the disease commence in the form of a simple cold, and the coronavirus or covid virus enters our body through the mucous membranes of the respiratory tract, mouth and eyes. It then damages the walls of the throat tissues, airways and lungs and turns them into a coronavirus-replicating plant. That is, new viruses are produced and begin to infect other tissues [8,9].

It develops rapidly and acute respiratory disease comes into existence. The lungs are damaged and acute respiratory failure which is hazardous to person's life.

Experts say that the incubation period of the virus can last from 2 to 14 days. However, the average is 7 days. That is, the coronavirus may not show its symptoms for 2 to 14 days after infection in humans. Worst of all, a person carrying the virus at this time can infect another person who comes in contact without knowing they are infected [10,11].

Avoid close contact with people who have symptoms of colds or flu. Close contact means being within two meters of the patient, in the same room with him or in the care area of the infected patient for a long time without personal protective equipment (gown, gloves, mask). Intimate contact also involves contact with the patient's room, contact with fluid things, such as phlegm, that is seperated from the infected person [12,13].

Pleurisy (pneumonia) is a lung infection. There are two types of pneumonia, which are associated with the following causes:

1. The most common symptoms of bacterial pneumonia are wet cough, sputum seperated, hyperthermia or hypothermia, headache, pains in the body and joints, as well as chest pain. 2. Symptoms of viral pneumonia are phlegm, dry cough, fever, chills, rhinitis, myalgia, headache, and also fatigue may be observed [14,15].

If the symptoms of an upper respiratory tract infection, such as a cold or flu, are not adequately treated (if the patient is very active and does not rest), severe respiratory complications (bronchitis, bronchiolitis, pneumonia) may develop. These infections can also develop separately from the common cold or flu. Chronic lung diseases can also may increase, for instance, asthma and cough are considered to be the most common symptoms of such diseases. It can also occur in diseases of the upper respiratory tract, such as pharyngitis or laryngitis. Dry cough is also characteristic of tracheitis. The infection spreads more from the upper respiratory tract to the lower parts. At present, the symptoms of coronavirus infection in patients which are ill with the virus, such as bronchitis, bronchiolitis, pneumonia, pharyngitis, laryngitis, tracheitis occur simultaneously with viral infections and we can

assume that they exhibit variable properties. We will cite the symptoms of these viral infectious diseases [16,17].

Bronchitis is characterized by inflammation of the bronchial tract (bronchi). This is one of the main conditions so that patients adress to medical attention. Acute bronchitis is the most common, it can be caused by viruses and bacteria. It usually lasts less than 3 weeks. The main symptoms of the patient are cough, the appearance of sputum (transparent, yellow, green or even with blood) runny nose, headache, fatigue, muscle aches, fever, general weakness and chest pain [3].

Bronchiolitis is a highly contagious acute inflammatory lesion of the bronchioles, usually caused by a viral infection (often with a respiratory-syncytial virus). This condition can occur at any age, but severe symptoms usually appear only in young children and infants. Many children with bronchiolitis have mild symptoms, and it recovers in two to three weeks. The usual symptoms that may develop in a child during the course of the disease are coughing, wheezing, and breathing heavily [18].

Pharyngitis is defined as a lesion or infection of the larynx or tonsils. Most viruses are etiologic, but they can also be caused by bacteria, allergens, or toxins. In infectious pharyngitis, bacteria or viruses can enter the mucous membrane of the larynx directly, developing a local inflammatory response. The most common symptoms are a sore throat or dry cough [19].

Laryngitis is an inflammation of the larynx. It can be chronic (lasting 3 weeks or longer) or acute (lasting less than 3 weeks). Its infectious cause is often viruses. The main symptoms of laryngitis are dry cough, hoarseness, sore throat and difficulty breathing.

Tracheitis is an inflammation of the airways (trachea). Many of the conditions that affect the trachea are viral or bacterial infections. Tracheitis can cause the following symptoms - dry, painful cough. It can turn into a wet cough during the course of the infection. The patient may also have hoarseness and sore throat [20].

Imagine the air going to your lungs. Air enters through the mouth, passes through the esophagus and then through the narrow tubular vessels, and eventually enters the tiny air sacs in the lungs. In the same place, air (oxygen) enters our bloodstream and, conversely, carbon dioxide is released. These sacs in the lungs of the oppressed are filled with water. As a result, the patient has difficulty breathing. Some people need artificial respiration using special ventilating equipment. A study of patients in China found that 14% of those infected with the virus had their condition worsened at the level of artificial respiration. According to available observations, 6% of patients with the virus are in a very serious condition. Their bodies begin to fail and the chances of death increase. The reason for this is that the patient's immune system is completely out of control and begins to damage the whole body. When a septic shock strikes the body, blood pressure can drop dangerously, and body parts may not function as well as they should or may not work at all.

Acute respiratory distress syndrome is caused by excessive inflammation of the lungs: Our body does not get enough oxygen to survive. The kidneys stop clearing blood. The inner walls of the intestine are damaged. "The virus causes an inflammatory process on a very large scale, as a result, several body organs fail," says Dr. Bharat Panxania [21].

If the patient's immune system does not overcome the virus, every point in our body will be damaged. In such a severe case, ECMO, an additional corporeal membrane oxidation method, is used. This is practically an artificial lung. It removes blood from the body through tubes, oxygenates (saturates it with oxygen) and sends it back to the body. However, in the end, the damage to the patient's body can be so severe that body parts may not be able to keep the patient alive [22].

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end, the damage to the patient's body can be so severe that body parts may not be able to keep the patient alive [22].

In addition, care, cleanliness, especially wet cleaning, periodic ventilation of rooms are important in the prevention of disease. Regular use of disinfectants, regular disinfection of stair handles, door handles are also recommended. It is necessary to keep tables and chairs clean, wipe mobile phones and TV remote controls with disinfectant solutions. Because they are sources of infection. It should be noted that this disease is not as dangerous as some media claims. As mentioned above, the disease is prevented first of all if the rules of personal hygiene are followed. If the disease is recorded, it will be cured. In elderly people (over 80 years of age), in people with 2-3 co-morbidities, in patients with weakened immune systems, the disease can be intense.

We must remember that the prevention of the spread of coronavirus infection depends in many ways on ourselves. If we collaborate together, if we follow the guidelines given by the World Health Organization and the Ministry of Health, we will definitely overcome this disease. Therefore, there is no reason for excessive anxiety and confusion. [23]

To prevent this disease, you should wash your hands frequently and thoroughly with soap and running water, use alcohol disinfectants, wash hands during and before and after meals, as well as before preparing meals, after the toilet or contact with an animal. As much as possible, minimize attendance at crowded places such as theaters, cinemas, airports, train stations, and large stores [24].

Antiseptic and disinfectant drugs should have a high antimicrobial effect, have not local tickling or burning effect on the tissues. Here is a brief overview of some of the currently widely used antiseptic and disinfectant drugs in medical practice.

Medical ethyl alcohol 96%, clear, colorless solution which has specific alcohol odor. Antiseptics and disinfectants. It has an antiseptic effect when applied to the surface. A 40% solution stops the growth of microorganisms, while a 70% solution completely stops the life activity of microorganisms. Ethyl alcohol at this concentration enters the deeper layers of the epidermis where more pathogenic microflora accumulates. Therefore, 70% ethyl alcohol is used to detoxify the skin. The effective influence of ethyl alcohol leads to the emergence of reflexes from skin receptors and the restoration of blood supply to the organs associated with the excited reflexogenic area. In excitation of large surfaces of the skin is observed by reflex excitation of the breath and an increase in blood pressure, as well as an acceleration of the rhythm of heart contractions. A 40% solution of ethyl alcohol is usually used to obtain the effect.

It is used to treat the skin as an antiseptic (surgeon's hands, surgical site, infection place, minor skin wounds and injuries and various other skin blemishes, etc.), soft tissue and visceral injuries, colds, migraines, etc. to normalize to supply with blood. The body is massaged in a 40% solution or used for compresses. In bronchitis and pneumonia, a light compress is applied to the back and chest, in migraines and colds - on the soles of the feet, in case of bruising - on the affected area [25].

Hydrogen peroxide 3% solution. Colorless, clear, odorless or powerful, specific odorous solution. Antiseptic and disinfectant. An antiseptic belonging to the group of oxidants. When the damaged skin and mucous membranes are treated with hydrogen peroxide, the release of active molecular oxygen from it results in mechanical cleaning of the wound and inactivation of organic matter (proteins, blood, pus). The antiseptic effect of the drug is not considered sterilizing, only the number of microorganisms is temporarily reduced when using it. Hydrogen peroxide also has hemostatic and odor-removing properties. It is used for washing and rinsing in new and infected wounds, usually, angina, dental and gynecological diseases, as well as to stop bleeding from small capillaries in superficial wounds, nosebleeds and other similar cases.

It utilized for surface, rinsing and washing. For rinsing the mouth and throat, a 3% solution is

used as a 0.25% solution diluted 1:11 with distilled or boiled water at room temperature.

Iodine has an atomic mass of 126,904 (Z = 53) and has 1 stable isotope. Iodine occurs in nature along with bromine. Chile nitrate mines contain large amounts of iodine. For this reason, Chile nitrate mines have until recently been considered as a major source of iodine. Iodine is one of the dispersed elements. Iodine compounds regulate metabolism in the body. If there is a lack of iodine, a disease called endemic goiter occurs. Iodine compounds are found in very small amounts in seawater. Some seaweeds (seaweed — kelp) contain iodine salts. Waves of water during strong storms push these weeds ashore. The herbs are dried and burned, and up to 2% iodine salts are extracted from their ashes. The iodine obtained in the manufacture is not very pure. Iodine purification is based on its sublimation property. Pure iodine is a crystalline, well-evaporating substance with a brown rhombic-shaped metallic luster. Iodine bearly melts in water. Because iodine molecules are non-polar, they are highly soluble in organic solvents. If KJ or HJ is added to water, iodine dissolves well in such water, because a complex compound containing KJ * (HJ3) is formed. When iodine reacts with starch, it turns a dark blue color. Chemically, iodine is one of the oxidants, but its oxidizing property is weaker than that of chlorine and bromine. In the F -Cl - Vg -J -At series, the electron affinity and oxidation potential decrease from left to right. Iodine can combine directly with sulfur, phosphorus, iron, mercury, and many other metals. Iodine is used in the preparation of various iodine compounds, and its solutions in alcohol are used in medicine as an antiseptic.

Potassium permanganate. Chemical compound formula is KMnO4. Antiseptic and disinfectant. Dark or reddish purple crystals or metallic shiny soft powder. It is soluble in water in a ratio of 1:18. Weak solutions are pink, concentrated - dark purple. Diluted solutions of potassium permanganate (about 0.1%) are widely used in medicine as antiseptics, for the treatment of itching, washing wounds and burns. Diluted (0.02-0.1%) potassium permanganate solution is used as an emetic for oral administration in cases of poisoning with morphine, aconitine and some other alkaloids [1]. It is used to lubricate wounds and burns - damaged wounds, ulcers and skin burns. It benefits in rinsing the oral cavity and oropharynx, that is - for infectious and inflammatory diseases of the mucous membrane of the oral cavity and oropharynx (including tonsillitis). It is used in gynecological and urological diseases - for washing and rinsing with colpitis and urethritis. It is used for washing - stomach in case of poisoning as a result of ingestion of alkaloids (morphine, aconitine, nicotine), hydrocyanic acid, phosphorus, quinine; for skin - when aniline falls on it; for eye - when struck by poisonous insects. Externally, in aqueous solutions for washing wounds (0.1-0.5%), for washing the mouth and throat (0.01-0.1%), for lubricating wounds and burns (2-5%), for washing (0.02-0.1%), in gynecological and urological practice, as well as it is utilized to wash a stomach in case of poisoning.

Flavorings — Essential oils, which are chemically synthesized from various chemicals, as well as extracted from plants and fruits, contain additives that give off apple, peach and other fruit scents. Chemically synthesized flavorings consist of gamma-nonalactane diacetyl, vanillin fatty acid, gamma-nonalactone diacetyl, ethyl butelad and other esters.

Discuss the results

The harmfulness and toxicity of chemicals which have antiseptic and disinfectant effects have been studied in the literature. From these chemicals, chemicals with harmless antiseptic and disinfectant effects were selected, and a complex disinfectant against various viral infectious diseases was prepared. It is a widely used method of antiseptic and disinfectant in the prevention and control of the spread of various viral infectious diseases. The method of preparation of the chemicals with antiseptic and disinfectant properties which are widely used as antiseptics and disinfectants, is easy to obtain and prepare, inexpensive, simple, popular, harmless, also has strong anti-parasitic effect, against various viral infectious

diseases in the prevention and eradication of various viral infectious diseases.It is recommended to spray frequently on chairs, tables, used equipment, computer mice, and on the steering-wheel of the car on the road, in short, in places where there is a possibility of germs. Nowadays, hands should be washed frequently and thoroughly with soap and running water, sprayed with a complex disinfectant in order to prevent coronavirus disease. People infected with coronavirus are advised to spray them on their hands and rooms every 2 hours. The use of this complex disinfectant once a day for years at home, in the car, at work is beneficial for every citizen, our children and our own health. The chemical composition and methods of preparation of our drug, which has antiseptic and disinfectant effect, are given in the experimental part.

Experimental section

After putting 100 ml of 96% ethyl alcohol into a conical flask, 10 ml of 3% solution of hydrogen peroxide, 1 ml of 5% solution of iodine, 2 ml of 0.1% solution of potassium permanganate and 1 ml of aromatizer and 20 ml of distilled water, we sit them for 20 minutes in a magnetic mixer. The reaction mixture is prepared which is a clear liquid of light blue color, a complex antiseptic and disinfectant against viral infections with a pleasant odor.

Conclusion

In conclusion,. this article presents the ways of preparation of the chemicals with antiseptic and disinfectant properties which are widely used as antiseptics and disinfectants, easy to obtain and prepare, low-priced, simple, widespread, harmless, also has powerful anti-parasitic effect, against various viral infectious diseases in the prevention and eradication of the spread of numerous viral infectious diseases.

Note: According to the informations in literature, because ginger root extract is known to have beneficial properties such as boosting and maintaining immunity, it is used in the prevention and treatment of colds and flu. It is anti-inflammatory, bactericidal antiseptic, antibacterial, stimulant, antispasmodic, cardiotonic, helps to sweat, clear the phlegm from throat and sustain normal body temperature, prevents colds in the internal organs, relaxes the abdomen and relieves nausea. Ginger helps to prevent cancer and decrease blood sugar. Preparation: You should add 1/3 part of ginger root powder in half tea spoon and 1/3 part of sliced lemon to 200 ml boiled water, after that, as the water becomes warmer, drink adding one teaspoon of honey as a tea.

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