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RESEARCH ARTICLE

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Prophylactic Measures in the Field of the Prevention of Intestinal Infections in Children and Adults

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ABSTRACT

The article discusses the features of prophylactic measures in the field of preventing the development of intestinal infections in children and adults. The author notes that taking proper measures on time in this area will reduce the dynamics of the spread of such diseases, as well as the number of cases of intestinal infections among people. The prevention measures which are considered in this work should be implemented in organizations, educational institutions and public places. This will reduce the cost of the consequences of the spread of various intestinal infections and preserve the health of adults and children, since the consequences of intestinal diseases can be significant for a person and cause the development of various systemic diseases of the gastrointestinal tract.

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INTRODUCTION

Gastrointestinal infections are the leading cause of morbidity and mortality worldwide. Gastrointestinal infections reflect the balance between internal virulence factors of enteropathogens and host mechanisms that protect against intestinal infections.[1] Host defense factors include gastric acidity, intestinal motility, normal local intestinal microflora, mucus secretion, and specific mucosal and systemic immune mechanisms. Acute diarrheal diseases, which are one of the main intestinal infections, in most cases are viral and have a short course.

Most gastrointestinal infections are not serious and go away without treatment after a few days. However, in some population groups, diarrheal diseases are accompanied by a high degree of morbidity and mortality. Elderly people, young children and people with chronic diseases or a weakened immune system may experience acute dehydration and need medical care.[2]

Many bacteria, viruses and parasites can infect the gastrointestinal tract. Since the symptoms are similar, differentiation between different etiologies is difficult. Microorganisms that cause gastrointestinal infections vary depending on the geographical region, the degree of economic development, the level of sanitation and hygiene standards.[3] In addition, the organization of prevention of such infections is important in this context, since it is always easier to prevent the disease than to treat it and its possible consequences.

The purpose of the study is to reveal the features of preventive measures in the field of preventing the development of intestinal infections in children and adults.

MATERIALS AND METHODS

When writing the paper, an array of scientific literature in the field of prevention of intestinal infections in children and adults was analyzed, while comparative and analytical research methods were used in processing the data obtained.

KEYWORDS:
Prevention, Intestinal infectious diseases, spread, measures on infection prevention.

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RESULTS

Gastrointestinal infections are viral, bacterial or parasitic infections that cause gastroenteritis, an inflammation of the gastrointestinal tract affecting both the stomach and the small intestine. Symptoms include diarrhea, vomiting, and abdominal pain. Dehydration is the main danger of gastrointestinal infections, so rehydration is important, but most gastrointestinal infections go away on their own and go away within a few days.[4] However, in medical institutions and in certain groups of the population (newborns/infants, immunocompromised patients or the elderly), they are potentially dangerous. Rapid diagnosis, appropriate treatment, and infection control are therefore particularly important in these contexts.

Infection with gastrointestinal parasites usually occurs when eating contaminated food or water. The *Giardia lamblia* parasite is often consumed by tourists who drink untreated river water. *Cryptosporidium* has been associated with drinking water or recreational water. Outbreaks of *Cyclospora* and *Cystoisospora* (formerly *Isospora*) have been associated with the consumption of contaminated food or water. These parasites are more common in tropical and subtropical regions of the world, and people traveling to countries endemic to this disease may be at increased risk of infection.[5]

Identification of the pathogen in clinically significant gastrointestinal infections is important to ensure appropriate treatment, if any. Most gastrointestinal infections go away untreated, except for rehydration to replenish lost fluid.

Adenovirus can cause diarrhea, fever, conjunctivitis, bladder infections and rashes, but the most common symptom is respiratory disease. After rotavirus, this is the most common cause of diarrhea in children.

Campylobacter is one of the most common bacterial causes of gastroenteritis worldwide and is often found in children under the age of two years. This can cause diarrhea (sometimes with blood), abdominal cramps, vomiting and fever. It is usually transmitted with food through raw or undercooked meat (especially poultry) or through contaminated milk.

Clostridium difficile infection is the cause of up to 25% of cases of antibiotic-associated diarrhea, most often infection occurs in hospitals or medical institutions. Elderly people and patients with weakened immune systems are most at risk. The recent emergence of highly toxic and resistant strains of *C.difficile* has led to more frequent and severe outbreaks, increased morbidity and mortality.

Escherichia coli, often referred to as *E.coli*, is the leading cause of traveler's diarrhea and the leading cause of diarrheal diseases in developing countries, especially among children. People usually become infected with *E.coli* when drinking water contaminated with human or animal feces.

Escherichia coli O157:H7 is a shiga toxin-producing form of *E.coli* bacteria that causes gastrointestinal infections with symptoms such as bloody diarrhea and vomiting. Although it usually goes away after a few days, sometimes (5-10% of infection cases) lead to hemolytic-uremic syndrome (HUS), which, if left untreated, can lead to kidney failure.

Helicobacter pylori, called *H.pylori*, is the cause of gastritis and is associated with the development of gastric and duodenal ulcers. This can cause stomach pain or nausea, but in many cases, there are no symptoms. In infected people, the risk of developing peptic ulcer is 10-20% during life, and the risk of stomach cancer is 1-2%.

Rotavirus is the most common cause of diarrhea in young children and infants and is responsible for the most severe cases. There is a vaccine against rotavirus, but worldwide it causes more than ½ million deaths a year among children under the age of five. The majority of cases happens in the developing countries.[6]

Salmonellosis and shigella are gastrointestinal diseases of food origin. *Salmonella* is common and is found in raw meat, poultry, seafood and eggs, as well as in milk and dairy products. Acute symptoms include nausea, vomiting, abdominal cramps, diarrhea, fever and headache.

Salmonellosis is one of the most common zoonotic diseases of humans and is inseparable from food safety and hygiene. Poultry is considered the main source of *Salmonella Enteritidis* infection (*S. Enteritidis*), and when ingested *Salmonella* infection enters the mouth and passes through the digestive tract into the intestines. When *salmonella* enters the intestine, it comes into contact with intestinal epithelial cells and causes a large-scale inflammatory reaction. In recent years, as a result of large-scale and prolonged use and abuse, antibiotics have caused a number of negative effects, including the formation of resistant strains, thereby disrupting the balance of the intestinal flora and even endangering human health. This situation has further complicated the prevention and treatment of salmonella disease.[7]

Shigella are often found in water contaminated with human feces. Symptoms of shigellosis (bacillary dysentery) include abdominal pain, cramps, diarrhea, fever, vomiting and blood, pus or mucus in the stool.

Staphylococcus aureus is the most common cause of food intoxication, characterized by a sudden/violent onset, severe nausea, convulsions, vomiting and diarrhea lasting 1-2 days. This conditional-pathogenic microorganism can be detected in humans (skin, infected cuts, nose and throat) and is associated with a wide range of foods, including meat and meat products, poultry and egg products, salads, bakery products and dairy products.

Yersinia enterocolitica, called *Y. enterocolitica*, is a relatively rare cause of diarrhea and abdominal pain. Infection most often occurs when eating contaminated foods, especially raw or undercooked pork products, as well as ice cream and milk. Common symptoms are fever, abdominal pain and diarrhea, which is often bloody.

Infectious intestinal diseases it is important to recognize and monitor epidemiological ones in order to prevent infection of more people. *E.coli*, *Salmonella*, *Campylobacter* and *Staphylococcus* are among the most common pathogens causing outbreaks of food origin. However, the most careful attention should be paid to the prevention of such diseases.

DISCUSSION

To reduce the impact of infectious agents, appropriate measures must be taken, especially in places where people come into

contact with each other. These are various public places, educational institutions, enterprises and other territories where, with insufficient attention to preventive measures, a focus of infection with intestinal infections may occur.

Managers and persons responsible for a favorable epidemiological environment need to take the necessary measures to protect people from infection with intestinal infections. To do this, it is necessary to identify microbiological risks, assess them and choose effective protection measures based on risk assessment. Then you need to check if the measures are working properly.[8]

First, it is necessary to try to prevent the existence of infectious agents. If this is not possible, it is necessary to make sure that the subjects of this environment use the necessary security measures. First of all, technical and organizational measures should be taken to minimize the risk. The guiding document here should be the rules for risk assessment, planning and protective measures to avoid deterioration of the health of employees due to infectious agents.

One example of a significant risk of infection may be the risk of infection from infectious agents that lead to serious illnesses when patients are admitted to the emergency department. In this case, one of the protective measures may be the presence of an isolated ward in the emergency department for patients with confirmed or suspected serious infectious diseases.

Another example is when there is a risk of contracting salmonellosis or parrot disease when cleaning an area where there is bird litter. Infectious agents can exist both in visible bird droppings and invisibly in dust. In this case, protective measures may include the use of cleaning methods that reduce the risk of dust, and the use of personal protective equipment, such as respiratory protection with an appropriate dust filter.

If there is a risk of infection, it is important that the person conducting the risk assessment and determining the necessary protective measures is competent enough to perform this task. Sometimes such competence is provided by hygiene services. To assess the specific risks of infection, you can also seek help from infectious diseases doctors, specialists in the prevention and control of infections, etc.[9]

The study of possible risks of infection should be carried out systematically. Specialists should regularly analyze the problem, whether there are any risks of the working environment due to the occurrence, increase or previous occurrence of infectious agents. The result of the risk assessment should be documented. The completeness of the documentation depends on the business activity and the identified risks of the working environment. The same applies to the risk of infection.

In some industries, there are many jobs with similar microbiological risks of the working environment. Examples include infectious diseases clinics and emergency departments in hospitals, sewage treatment plants, and laboratories for microbiological or chemical diagnostics of samples taken from humans. For each of these operations, it is usually possible to conduct a general assessment of the overall risks. At the same time, it is necessary to take into account local conditions when assessing risks.

Differences between workplaces may include methods, technical equipment and the frequency of infection of the population. After the working environment has been studied and the risk of infection in the workplace has been confirmed, it is necessary to eliminate these risks. First of all, you need to try to eliminate the cause of the risk of infection. If this is not possible, it is necessary to take the necessary preventive protective measures. A certain order must be followed when considering what protective measures to take.

In most cases, it is impossible to choose which infectious agents exist in the workplace. In fact, it is possible to choose which infectious agents arise only in cases of deliberate use of microorganisms.

When analyzing infectious agents for diagnostic purposes, it is sometimes possible to use less dangerous infectious agents as a control. In all senses and purposes, they are similar to pathogenic infectious agents, but less harmful.

By eliminating the conditions for growth, it is possible to prevent the appearance of infectious agents. Important conditions for growth are humidity, organic material for easily accessible nutrition and the right temperature. Thus, cleaning and maintaining cleanliness are also ways to reduce the risk of emergence and growth, especially of bacteria, but also of strong viruses.[10]

The methods used to prevent unwanted occurrence and growth should be adapted to the operations.[11-13] Routine cleaning may not be enough if various infectious agents are found in large numbers, for example, in care facilities or if someone has had a stomach virus.[14]

If there is a risk of infection, one may also need to review the working methods, procedures and technical devices used when performing operations. If it turns out that a certain method, procedure, or device is causing problems, it needs to be fixed.

Cleaning contaminated floors and walls with compressed air or pressurized water can lead to the formation of clouds of tiny water droplets (aerosols) with infectious agents that spread easily. You should choose a different cleaning method if there is a risk of deterioration of health.

As far as possible, it is necessary to choose methods of work that reduce the risk of injury with sharp objects when the work involves handling biological fluids or other samples taken from humans or animals. It is also necessary to use products with puncture protection when there is a risk of contact with human blood or other biological fluids.

If it is impossible to prevent the undesirable appearance of infectious agents and if the choice of methodology or technical solutions is insufficient or even impossible, other measures must be taken. This includes attempts to neutralize infectious agents as close to the source as possible.

One example is the use of disinfectants in laboratories that analyse samples from humans or animals to neutralize any infectious agents in the sample after testing is completed.[15]

Another example is the disposal of used hypodermic needles or scalpel blades using a special waste container immediately

after use on humans or animals instead of temporarily storing sharp objects in a kidney cup or similar.

By preventing the appearance of infectious agents, having appropriate working methods, procedures, technical equipment and taking measures as close as possible to the source, it is also possible to limit the number of people who can be affected by infectious agents.

An example of additional measures to reduce the number of exposed persons may be the restriction of work to a certain time or place and the presence of only those employees who are necessary to perform the work. This may, for example, mean limiting the number of people caring for patients with serious infectious diseases, or people in laboratories where infectious agents are diagnosed.

When other protective measures are insufficient, it is also necessary to use personal protective equipment. On the other hand, it is unacceptable to use personal protective equipment instead of other protective measures.

It is always necessary to observe hygiene rules when there is a risk of infection. In cases where it is necessary to come into contact with human blood and other biological fluids, special hygiene measures should be taken. This applies to health and care services, as well as to other employees who may come into contact with biological fluids, such as security guards, police and preschool staff.

Special hygiene measures should also be taken when working in veterinary medicine. The provisions on special hygiene measures do not apply to slaughterhouses and the food industry.

Working with special hygiene measures means, in particular, that when working it is necessary:

- use gloves, protective clothing and other protective equipment;
- carry out timely disinfection and hand washing;
- organize safe work with hypodermic needles and sharp objects;
- know the procedure when spilling something, stab wounds, etc.

The employee must follow the oral and written instructions given by the employer, but it is also important that the person who may be infected has received appropriate training and practice. The training should include several different elements:

- information about which infectious agents may occur in the workplace;
- explanation of the meaning of specific hygiene measures;
- information about the algorithm of procedures and measures on reducing risks in the event of accidents, such as leakage of blood/urine samples;
- learning the rules of handling sharp objects;
- learning the rules for handling waste containing sharp objects, etc.

In the case of an acute risk of infection, employees with education and experience are better prepared for protection infection. Thus, the regulations require that employees who may come into contact with the blood or other biological fluids of humans or animals should be trained.

Since infectious agents are transmitted in different ways and have different characteristics, specialists should take into account what infectious agents are in order to determine the necessary protective measures. If there is a risk of infection at work, one must follow hygiene rules.

If the manager, in the process of managing his work environment, complies with the provisions and recommendations for the design and maintenance of workplaces and rooms for staff, the risk of infection of employees with infectious diseases or exposure to other microbiological health risks is reduced. In workplaces where it is possible to be exposed to serious health risks due to infectious agents, additional measures are often needed to be taken.

Contact agents of intestinal infection are common in many workplaces. In healthcare and social care, this may be the most common route of transmission.

When employees are at risk of getting infected by contact, the following measures are important to reduce the risk of infection:

- maintaining good hand hygiene and using hand sanitizer;
- prohibition of touching the face with hands;
- availability of systematic cleaning procedures at the workplace;
- necessary equipment and workplace organization to prevent intestinal infections;
- conducting training and instructing personnel on the risks of infection with serious infectious agents;
- use protective gloves if the risk assessment shows that this is necessary.

In professions where contact with human biological fluids is possible, special rules should be applied. Then it is necessary to observe certain hygiene measures. The same applies to activities within the framework of veterinary care. This means using, among other things:

- gloves when there is a risk of contact with biological fluids;
- protective clothing when working on care in close contact;
- the face shield when there is a risk of splashing bodily fluids, etc.

The risk of infection through food at work is relatively low. However, employees of slaughterhouses are sometimes infected because of the nature of their work. Therefore, it is important to pay attention to hand hygiene and have access to hand washing. There is food legislation aimed at preventing human diseases from food products. It is also important to comply with this legislation if you work with food products and especially if you deal with raw or insufficiently heated food products or taste them.

Contamination from sewage can be avoided by various measures. Examples of measures may include:

- technical measures to prevent splashing from outdoor pools;
- elimination of infectious agents by heating, chemical agents or cleaning process;
- taking measures necessary to prevent aerosols (small drops of water in the air that you can inhale), etc.

CONCLUSION

Measures taken on time contribute to the reduction of the developing infections. The risk of developing intestinal infections among children and adults is an important measure that helps to reduce infectious morbidity. It is very important to take the necessary preventive measures in children's and adult groups, where employees communicate closely with each other, since the risk of transmission of intestinal infections in these cases increases several times. For this reason, compliance with the above rules and requirements is mandatory both for children's groups and for organizations whose employees may also become victims of this or that intestinal infection because their work is directly or indirectly related to contacts with other people.

Thereafter, understanding the importance of preventive measures in the field of intestinal infections can become the key to the health of the nation as a whole.

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