

# The Role of Hemolytic Enteropathogenic Escherichia Coli (EPEC) in the Development of Diarrhea in Children, its Features of Prevention and Treatment

Assistant Yusupov Mashrab Ismatillayevich<sup>1</sup>, Shaykulov Hamza Shodiyevich<sup>2</sup>

<sup>1</sup>Head of the Department of Microbiology, Virusology and Immunology

<sup>2</sup>Assistant of the Department of Microbiology, Virusology and Immunology

<sup>1,2</sup>Samarkand State Medical Institute, Samarkand, Uzbekistan

## ABSTRACT

The article deals with a group of infectious diseases caused by pathogenic serotypes of Escherichia coli. Most often, these bacteria cause acute intestinal disorders (intestinal coli infection), and in young children and in weakened persons, they can also cause damage to the urinary tract, sometimes the development of cholecystitis, meningitis, and sepsis. Distinguish between enteropathogenic, enterotoxigenic, enteroinvasive, enterohemorrhagic, enteroadhesive infection and other infections.

**KEYWORDS:** Infectious diseases, pathogen, E. coli, bacteria, diarrhea

## INTRODUCTION

The main facts

- Diarrhea is the second leading cause of death among children under five years of age. It can be prevented and treated.
- Every year 525,000 children under the age of five die from diarrhea.
- A significant proportion of diarrheal diseases can be prevented by providing safe drinking water and adequate sanitation and hygiene.
- Approximately 1.7 billion cases of childhood diarrhea are reported annually worldwide.
- Diarrhea is one of the leading causes of malnutrition among children under five years of age.

Diarrhea is the second leading cause of death in children under five years of age, with 525,000 deaths annually. Diarrhea can last for several days and can drain the body of water and salts it needs to survive. In the past, the main causes of death associated with diarrhea were dehydration and fluid loss in most cases. Currently, an increasing proportion of all deaths attributable to diarrhea are attributed to other causes, such as septic bacterial infections. Children who are malnourished or those with weakened immunity are at greatest risk of life-threatening diarrhea.

Diarrhea is defined as loose or loose stools three or more times a day (or more often than usual for a particular person). Frequent bowel movements are not diarrhea. Loose, "pasty" stools of breastfed babies are also not diarrhea. Diarrhea is usually a symptom of an intestinal tract infection that can be caused by various bacteria, viruses, and parasites. Infection spreads through

contaminated food or drinking water, or from person to person through poor hygiene.

Measures to prevent diarrhea, ensuring safe drinking water, using improved sanitation, and hand washing with soap and water, can help reduce the risk of illness. Diarrhea is treated with oral rehydration salts (ORS), a mixture of pure water, salt and sugar. In addition, an additional course of treatment with 20 mg zinc tablets for 10-14 days can shorten the duration of diarrhea and improve results.

There are three clinical types of diarrhea:

- Acute watery diarrhea — lasting hours or days and includes cholera;
- Acute bloody diarrhea - also called dysentery; and
- Persistent diarrhea - lasts 14 or more days.

## Incidence of diarrhea

Diarrhea is one of the leading causes of child mortality and morbidity in the world. It develops mainly as a result of the consumption of contaminated food and water. Globally, about 780 million people lack access to improved water and 2.5 billion people lack access to basic sanitation. In developing countries, diarrhea caused by infection is widespread.

In low-income countries, children under the age of three have diarrhea, on average, three times a year. Each time, children are deprived of the nutrition they need to grow. As a result, diarrhea is one of the leading causes of malnutrition, and children who are malnourished are more likely to develop diarrhea.

## Dehydration

The most significant threat posed by diarrhea is dehydration or dehydration. During diarrhea, water and electrolytes (sodium, chlorine, potassium, and bicarbonate) are excreted from the body in loose stools, vomiting, sweat, urine, and respiration. Dehydration occurs if these losses are not reimbursed.

**There are three degrees of dehydration.**

- Severe dehydration (at least two of the following):
  - lethargy / unconsciousness;
  - sunken eyes;
  - the patient cannot drink or drinks badly;
  - after pinching, the skin returns to its original state very slowly ( $\geq 2$  seconds).
- Moderate dehydration:
  - ✓ restless behavior, irritability;
  - ✓ sunken eyes;
  - ✓ the patient drinks with greed, is thirsty.
- No dehydration (not enough evidence to qualify as moderate or severe dehydration).

**The reasons**

**Infection:** Diarrhea is a symptom of infections caused by a wide variety of bacteria, viruses and parasites, most of which are spread through fecal contaminated water. Infections are most common where there is a shortage of clean water for drinking, cooking and personal hygiene. Rotavirus and Escherichia coli are the two most common causes of diarrhea, both moderate and severe, in low-income countries. Other pathogens, such as cryptosporidium and shigella, may also be relevant. It is also necessary to take into account the etiological patterns characteristic of a particular area.

**Malnutrition:** Children dying of diarrhea often suffer from concomitant malnutrition, which makes them more vulnerable. Each case of diarrhea, in turn, exacerbates their malnutrition. Diarrhea is one of the leading causes of malnutrition among children under five years of age.

**Source:** Of particular concern is water contaminated with human faeces, such as from wastewater, sedimentation tanks and latrines. Animal faeces also contain microorganisms that can cause diarrhea.

**Other causes:** Diarrhea can also spread from person to person, exacerbated by inadequate personal hygiene. Food is another significant cause of diarrhea when prepared or stored in unhygienic conditions. The unsafe storage and handling of water in the household is also an important factor. Fish and seafood from contaminated water can also cause this disease.

**Prevention and treatment**

Basic measures to prevent diarrhea include the following:

- access to safe drinking water;
- improved sanitation facilities;
- washing hands with soap;
- exclusive breastfeeding of the baby during the first six months of life;
- proper personal and food hygiene;

- health education about the ways of spreading infections;
- vaccination against rotavirus infection.

The main measures for treating diarrhea include the following:

- Rehydration: with oral rehydration salt (ORS) solution. ORS is a mixture of pure water, salt and sugar that can be safely prepared at home. Treatment with this mixture costs a few cents. ORS is absorbed in the small intestine and replaces water and electrolytes excreted in feces.
- Zinc supplements: Zinc supplements reduce the duration of diarrhea by 25% and lead to a decrease in stool volume by 30%.
- Rehydration via IV line in case of acute dehydration or shock.
- Nutrient-rich foods: The cycle of malnutrition and diarrhea can be broken by feeding children nutrient-rich foods (including breast milk) during diarrhea and then feeding recovered children nutritious foods (including exclusive breastfeeding during the first six months of life).
- Consult with a healthcare professional, in particular regarding the management of persistent diarrhea, blood in stools or signs of dehydration.

**References**

- [1] Коли-инфекция кишечная Большая российская энциклопедия - электронная версия. bigenc.ru. Дата обращения 27 августа 2019.
- [2] Диарея путешественников | Медицинская газета «Здоровье Украины», Медицинское издание, медицинские издательства в Украине
- [3] <http://www.infectology.ru/nosology/infectious/bacteriosis/escherichiosis.aspx> Эшерихиоз
- [4] Gene Sequence Of Deadly E. Coli Reveals Surprisingly Dynamic Genome (недоступная ссылка). Science Daily (25 января 2001). Дата обращения 8 февраля 2007. Архивировано 21 февраля 2007 года.
- [5] <http://medkarta.com/?cat=article&id=19158> Лечение
- [6] Therapeutic use of bacteriophages in bacterial infections (недоступная ссылка). Polish Academy of Sciences. Дата обращения 10 января 2013. Архивировано 8 февраля 2006 года.
- [7] Medical conditions treated with phage therapy (недоступная ссылка). Phage Therapy Center. Дата обращения 10 января 2013. Архивировано 23 октября 2012 года.
- [8] Girard M., Steele D., Chaignat C., Kieny M. A review of vaccine research and development: human enteric infections (англ.) // Vaccine : journal. — 2006. — Vol. 24, no. 15. — P. 2732-2750. — doi:10.1016/j.vaccine.2005.10.014. — PMID 16483695.