

FEDERAL STATE BUDGETARY EDUCATIONAL INSTITUTION OF
HIGHER EDUCATION "NORTH OSSETIAN STATE MEDICAL ACADEMY»
MINISTRY OF HEALTH OF THE RUSSIAN FEDERATION

Department of Infectious diseases

METHODOLOGICAL GUIDE

CHOLERA

for students studying in the specialty
31.05.01 General medicine (specialty)

Vladikavkaz, 2020

UDC 616.932
BBK 55.141

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Cholera - 2020

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Approved and recommended for publication by the Central Coordinating Educational and Methodological Council of the Federal State Budgetary Educational Institution SOGMA of the Ministry of Health of the Russian Federation (protocol N 6 of 06.07.2020).

North Ossetian State Medical Academy, 2020

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THE THEME OF THE LESSON: «CHOLERA»

Cholera is an acute infectious human disease with a faecal-oral mechanism of infection, caused by cholera vibrios, which is characterized by dehydration as a result of fluid and salt losses with watery faeces and vomit. The incidence of cholera is characterized by the development of pandemics that claim millions of human lives. The last pandemic has been going on since 1961. It is characterized by its spread to most countries of the world. The total number of only bacteriologically confirmed cases according to incomplete data was 1.3 million. In 1970, cholera outbreaks were registered. In our country (the Astrakhan region, PicernoMaurier). Individual cases of the disease are detected at the present time. The severity of the course and the potential for pandemic spread determine the inclusion of cholera in the list of diseases to be monitored according to international health regulations and the need for early clinical diagnosis and intensive treatment with rehydration methods that prevent death.

The purpose of the lesson: to learn early diagnosis of cholera, to master the tactics of managing patients at the pre-hospital stage, to know the basic principles of treating patients in a hospital and measures to prevent the disease.

MEDICAL PRACTICAL SKILLS MASTERED BY STUDENTS ON THE TOPIC

The student should be able to:

- correctly collect an anamnesis and make an examination of the patient, to identify the characteristic clinical signs of cholera, in its early period;
- Purposefully identify an epidemiological history;
- Make a visual inspection of bowel movements and vomit masses, give them an assessment;
- organize the collection and delivery of material for bacteriological research;
- make a preliminary diagnosis;
- determine the degree of dehydration based on clinical and laboratory data;
- diagnose cholera complications (hypovolemic shock, acute renal failure);
- carry out a differential diagnosis with similar clinical manifestations of infectious (food toxicoinfections, acute dysentery) and non-infectious (poison-poisoning) diseases;
- taking into account the degree of dehydration, prescribe basic rehydration therapy (oral or infusion);
- to assess the adequacy of the therapy performed by the disappearance of clinical symptoms of dehydration and normalization of laboratory parameters;
- prescribe basic rehydration solutions;
- carry out anti-epidemic measures in the cholera focus, taking into account the transmission routes and factors operating in specific conditions.

QUESTIONS FOR SELF-MONITORING

1. What is the biotype of cholera Vibrio caused by the recent cholera pandemic, what are its features as an etiological factor?
2. What features of pathogenesis determine the severity of those values and the danger of epidemic cholera?
3. List the earliest signs of cholera.
4. Name the clinical signs that indicate dehydration of the body.
5. What are the physiological parameters of blood acid-base status and electrolyte balance? What deviations from the norm occur when the body is dehydrated in patients with cholera?
6. How is the degree of dehydration in cholera assessed and what is the clinical and pathogenetic characteristic of individual degrees?
7. What measures and laboratory tests should be carried out for patients suspected of cholera?
8. How to make a fecal material (feces and vomiting) of the masses) for bacteriological examination?
9. With what diseases do we have to differentiate cholera?
10. What are the principles of rehydration therapy? What kind of complications are possible during intravenous rehydration?
11. What are the indications for oral rehydration?
12. List and describe the main polyionic CRISTALLON solutions for oral and intravenous rehydration.
13. What are the rules for hospital discharge of patients who have suffered from cholera?
14. What anti-epidemic measures should be taken when identifying a cholera patient?

Introductory task

Patient S. 32 years old called the doctor from the polyclinic 30.08 at 16 o'clock. Complaints of runny stools, vomiting, extreme thirst and weakness. The temperature is 36.2° C. I got Sick on the night of 30.08. Suddenly there was a liquid watery stool, as well as vomiting without previous nausea. Weakness was rapidly increasing, and thirst was bothering her. The patient arrived 3 days ago from Central Asia, where she was on a tour. Objectively: the condition is moderate in severity. The skin is pale, smooth to the touch, cyanosis of the nasolabial triangle. Turgor of the skin is moderately reduced on the hands and abdomen. Pulse 120 V min, blood PRESSURE 100/60 mm Hg. St. in the lungs there are no wheezes. The tongue is dry, covered with a white coating. The abdomen is regular in shape, when palpation is soft, painless in all parts, there is a rumbling sound. The liver and spleen are not palpable. She notes that she has never urinated since this morning. My mind is clear. There are no meningeal signs. What can I think about? The idea of cholera should be based on such signs of cholera as sudden symptoms of gastroenteritis and rapidly increasing dehydration, especially if you take into account the data of the epidemiological anamnesis (stay before the disease in hot regions). Make a diagnosis or suspect cholera is possible when examining a patient — this will help you to diagnose the algorithm scheme of the

approximate basis for the actions of a doctor at the bedside of a patient with cholera and differential diagnostic tables.

ALGORITHM FOR DIAGNOSING CHOLERA

Sudden onset at normal temperature

There are

The research continues

Copious amount of watery stools without painful manifestations

There are

The research continues

Copious vomiting without prior nausea (vomiting "fountain") and does not bring relief

There are

The research continues

Rapid increase in symptoms of dehydration (thirst, decreased skin turgor, weight loss, limb muscle spasms, etc.)

There are

The research continues

Epidemiological anamnesis (stay in a cholera-affected area, contact with a sick person or a bacterium-releasing agent)

There are

A clinical diagnosis is made: "cholera»

Positive results of bacteriological examination of stool and vomit

There are

The diagnosis of "cholera" is proved by

DIAGRAM OF THE APPROXIMATE BASIS FOR A DOCTOR'S ACTIONS IN DIAGNOSING CHOLERA

Stages of action	Algorithm (sequence of clinical assessment)	Indicative signs (control criteria)
1. Complaints and anamnesis of the disease	Find out from the patient or accompanying person the presence of vomiting, runny stools, weakness, dry mouth, thirst, abdominal pain, fever. Specify how acute the disease started. To determine the sequence of occurrence of clinical symptoms of the disease	, cholera is characterized by an acute onset of illness with the sudden appearance of copious, often recurring watery stools. Decontamination is painless. After the liquid stool and sometimes simultaneously with it, there is a plentiful repeated vomiting, which does not bring relief. Abdominal pain is absent. The disease develops against the background of normal

		temperature. The reason for the decrease in axillary body temperature is a violation of peripheral circulation as a result of dehydration and impaired hemodynamics- МОДИНАМИКИ
2. To collect epidemiological-medical history	Clarify - whether there was contact with the patient with cholera, stay in the area where cases of cholera were registered, drinking water from open reservoirs	Infection occurs when drinking water from doubtful sources, contaminated by patients or bacterial separators
3. Examine the patient: skin, visible mucous membranes	Carefully examine the skin and mucous membranes, pay attention to the appearance, the presence of cyanosis. Check the skin turgor	The skin becomes cyanotic depending on the degree of hypoxia (from nasolabial triangle cyanosis to General cyanosis). The skin is cold, and the turgor of the skin is reduced. There is a dryness of the mucous membranes
musculoskeletal system	Examine the muscular system	At III—IV degree of dehydration, convulsive muscle contractions that are tonic in nature appear. In the Genesis of convulsions, the leading importance is acidosis with the accumulation of under-oxidized products (lactic and pyruvic acids) and hypokalemia
respiratory	Determine the frequency and nature of breathing	is characterized by shortness of breath, with III—IV degree of dehydration — violation of the depth and rhythm of breathing. The pathophysiological basis of respiratory disorders in cholera is mainly circulatory hypoxia, which develops as a result of blood thickening and hemodynamic disorders
system-circulatory	Determine the frequency and nature of the pulse, you can listen to heart tones, measure blood pressure	Characterized by tachycardia and a decrease in blood pressure. Further increase in dehydration leads to the development of hypovolemic shock due to a decrease in the volume of circulating blood, violation of Central and peripheral hemodynamics and other violations of homeostasis (metabolic acidosis, transmineralization, etc.)
the digestive organs	Perform percussion and	

<p>system digestiveurinary organs</p> <p>system urinary</p> <p>system nervous</p> <p>system</p>	<p>palpation of the abdominal organs</p> <p>Monitor diuresis</p> <p>Evaluate the patient's consciousness</p>	<p>The absence of pain</p> <p>There is oligoanuria, which is associated with a violation of glomerular filtration and a decrease in renal blood flow, as well as due to the sodium-retaining action of aldosterone</p> <p>Consciousness is preserved. The patient is sluggish, adynamic. At III-IV degree of dehydration, prostration is possible</p>
<p>4. Interpret the results of additional research methods</p>	<p>Evaluate your total blood count</p> <p>To investigate the electrolyte composition and acid state of the blood</p> <p>Determine the hematocrit index</p> <p>Conduct a bacteriological examination of stool and vomit</p>	<p>The hemogram is characterized by moderate leukocytosis (neutrophilosis due to rod-shaped shift)</p> <p>There is hypokalemia, hyponatremia as a consequence of the loss of these ions with stool and vomit. Decompensated metabolic acidosis develops as a result of the loss of bicarbonate with excretions, as well as the accumulation of under-oxidized products in tissues under hypoxia conditions</p> <p>An increase in the hematocrit index as a result of blood thickening. When seeding, cholera Vibrio is released into the culture medium</p>

Differential and diagnostic signs of cholera, acute dysentery, food toxicoinfections(PTI), rotavirus gastroenteritis (RG) and acute intestinal infections caused by non-agglutinating vibrios (NAG infection)

Клиничес- Clinical- signs	of Cholera	Acute dysentery	PETIT	RG	NAG- infection
1	2	3	4	5	6
the nature of the chair	Watery, often discolored	Scanty, fecal-free, sometimes mixed with mucus and streaks	Watery, with an unpleasant smell, often greenish	Watery, abundant, foamy, bright yellow	Bowl porridge-like. Only in severe cases watery
Defecation	is painless	tenesmus	is Painful in	gastroenteritis is	painless
abdominal Pain is	Uncharacteristic	Often severe	Often severe	moderate	moderate
Localization of pain	-	Lower abdomen or in the left iliac region	In the epigastrium or paraumbilical region	spilled	In the epigastrium or paraumbilical region
Vomiting	Multiple, watery, non-irritating	In severe cases	Usually upto 10-10 times, brings relief	Up to 3-4 times, more often	Up to 5-10 times, usually after
Chills	Uncharacteristic	Typical	Typical	It is rare	Not typical
Body temperature	Normal or elevated	Increased speed	Increased, can be reduced with	subfebrile	normal
Rumbling in the stomach	is Sonorous, constant	Not typical	Silent, occasionally	Loud rumbling	Sound, not constant
Spasm and soreness of the sigmoid	Not marked	are typical	It occurs in the gastroenteric	Not marked	There is
o nflammation f the mucous	bsent	bsent	bsent	yperemia and granularity	re absent
ehydration f III- IV	typical	lot marked	t is rare	lot marked	are

Differential diagnosis of cholera and acute poisoning caused by chemicals (chlorinated hydrocarbons, organophosphorus compounds (FOS). dihydroxyl alcohols, arsenic preparations), pale toadstool

Symptoms	of Cholera	Dichloroethane	FOS	Polyethylene glycol	Arsenic	Pale toadstool
Onset of the disease	Acute, with the sudden appearance of liquid stool	a few minutes after poisoning appear dizziness, ataxia, psychomotor agitation	15-20 minutes after poisoning appear dizziness, headache, feeling of fear, psychomotor agitation	Gradual, in the first 12 hours, by the type of alcoholic intoxication	acute	Acute. 30 minutes after eating mushrooms
The nature of the stool	Plentiful, watery, odorless, multiple	Liquid, flaky, with an unpleasant smell	Liquid, fecal nature,	not abundant Liquid, fecal nature	Liquid, frequent, like rice broth	Copious, watery, repeated
Vomiting	Without previous nausea, abundant, watery	Repeated, with a heavy admixture of bile	Repeated, not abundant	Nausea, repeated vomiting	Persistent vomiting, burning sensation in the mouth	Unavoidable, copious
Headache	Not typical	Typical	Typical	Moderate	Strong	Typical
Sharp abdominal pain	Not typical	Typical	Typical	Moderate	Strong	Typical

Dry skin	Expressed	Missing	Missing	Moderate	Moderate	Expressed
Hyperhidrosis	Not typical	Sweating, salivation, and bronchitis	Pronounced, sweating, salivation, bronchorrhea	Not typical	Not typical	Not typical
Hyperkinesia	At III-IV degree of dehydration	Not typical	Chorioidea type, miofibrilly	Hypertonicity of the muscles of the limbs, lockjaw chewing muscles	Generalized seizures	Moderate clonic-tonic seizures
Blood pressure	Reduced	Short-term increase	Raised	Lowered	Lowered	Lowered
Pulse	Tachycardia	Tachycardia	Bradycardia	Tachycardia	Tachycardia	Tachycardia
Respiratory disorders	Tachypnea in IV St. dehydration	Bradypnea, coma-pathological types of breathing	Bradypnea, coma-pathological types of breathing	Pathological types of breathing, apnea	Tachypnea, pathological types of breathing	Tachypnea
Liver damage	Not typical	Toxic hepatitis, up to acute dystrophy	Not expressed	Toxic hepatitis	Toxic hepatitis	Toxic hepatitis
Kidney damage	Oligoanuria in the IV St. - acute kidney failure	Macrohematuria, development of acute renal failure	Polyuria	The rapid development of AKI	Oligoanuria up to acute kidney injury	Surge arresters of various degrees
CNS lesions	Prostration	Toxic	SOPOR,	Coma of	Toxic	Coma of

	with degree dehydration	IV of coma	encephalopathy, coma	coma	varying severity	encephalopathy, coma	varying severity
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CONTROL TASKS |

Task 1

Patient W-36 years old fell ill acutely. In the middle of the night, there was a liquid watery stool, repeated vomiting, later joined by weakness, dizziness. The patient went to the regional hospital of Ramenskoye district, where she was diagnosed with "acute food poisoning". Gastric lavage was performed, cordiamine was administered subcutaneously and intravenously with 500 ml of 5% glucose solution with vitamin C. the patient's Condition worsened: vomiting increased to 15-20 times, liquid watery stools without counting, and she was worried about sharp weakness. There were cramps of the limbs, a strong thirst. A patient in extremely serious condition is transferred from the district hospital to the CRH. Objectively-acrocyanosis and cyanosis of the nasolabial triangle, facial features are pointed, dark circles around the eyes, generalized convulsions. Voice husky, skin turgor decreased (skinfold straightened slowly), the body temperature of 35.5° C, pulse is thready HELL 45/0 mm Hg. article Language dry, lined greyish tinge, the abdomen retracted, soft, peristalsis increased watery Stool type of the congee. The urine does not separate. The patient is conscious, lethargic, and comes into contact with difficulty

1. What additional questions should I ask the patient to clarify their medical history?
2. Make Your diagnosis.
3. Determine the degree of dehydration.
4. Make a differential diagnosis with food toxicoinfections and acute dysentery.
5. Was the patient treated correctly by a doctor at a local hospital?

Task 2

A 42-year-old patient M. applied to the medical center of the airport terminal. Delivered by fellow members of a tour group returning from India, where they have been for 10 days. I got sick on the plane at night. There was a rumbling in the stomach and a thin watery stool. Before going to the doctor, the stool was more than 20 times, three times-copious vomiting of watery contents. Dizziness appeared, and weakness increased. After 12 hours from the beginning of the disease, the condition is extremely severe. General blueness of skin ulcers, dryness of mucous membranes, speaks in a whisper. His eyes were sunken, his features sharpened. Turgor of the skin is sharply reduced, a symptom of "washerwoman's hand". The skin is cold, covered with sticky sweat. The body temperature is 35.4°C. Periodically, the patient becomes agitated, there are spasms of the extremities. The tongue is dry, covered with a brown coating. Shortness of breath - 34 in min. Pulse threadlike, heart rate 130 beats per minute. Blood PRESSURE is 30/0 mm Hg. u. the Abdomen is painless on palpation. In the minds. There are no meningeal symptoms.

1. Justify the clinical diagnosis and determine the degree of dehydration.
2. What measures should be taken when identifying a cholera patient in transport?
3. Prescribe rehydration therapy (the patient's pre-illness weight is 70 kg).

4. what studies should be performed in the intensive care unit to assess the severity of the disease and the adequacy of therapy? In the patient, the following CS indicators were established: pH 7.32; PCO₂ 22 mm Hg; SB 16 mmol/l; BE -8 mmol/l; hematocrit 49%. Is the therapy performed adequate?

Task 3

One of the members of a tourist group traveling in India (see the previous task), has runny stools (was 3 times) , slight weakness, dry mouth. He informed the doctor of the station's medical center about this. Viewed. Pathology on the part of internal organs was not detected. Liquid stool continues.

1. Make a preliminary diagnosis.
2. Schedule therapy.
3. What are the further management tactics of such a patient?

Task 4

In the course of intensive therapy of the patient M. 42 years old (see task 2) with the diagnosis "cholera, dehydration of the IV degree", the absence of urination was found. It is also noted intermittent tachycardia, arching pain in the stomach: revealed swelling and tenderness of the abdomen, auscultation peristalsis is not defined.

1. what complications can you think of? What are their reasons?
2. What laboratory and instrumental methods should be implemented?
3. What treatment measures does the patient need in case of acute renal failure?
 4. What is the therapeutic tactic when hypokalemia occurs

Task 5

Emergency medical assistance was called to the station's medical center to a patient Zh.50 years old, who came from the Astrakhan region. I

The patient in the early morning in the car began to have liquid stool, watery, then vomiting several times. I fainted at the train station. Food toxicoinfection is suspected in the medical center, because the patient ate sandwiches with stale sausage on the road. Blood PRESSURE is 90/70 mm Hg. u. Made p / K mesaton and epinephrine.

The ambulance doctor found a General severe condition, convulsions of the calf muscles, cyanosis, dryness of the mucous membranes and skin, severe thirst, aphonia, tachycardia, a small spilled soreness on palpation of the abdomen. In the car "first aid" initiated the introduction of gemodez (200 m; glucose solution (1000 ml)). However, the condition did not improve. Anuria was detected in the infectious diseases Department.

1. Put the diagnosis. What diseases should be differentiated between?
2. give an assessment of the therapeutic tactics carried out in the medical center and by the ambulance doctor.
3. Why was the treatment with hemodesis and 5% glucose solution ineffective?

4. Assign a treatment plan to the patient if his weight before the disease was 80 kg, and dehydration of the III—IV degree.

Task 6

A 47-year-old patient was taken to the infectious diseases hospital in a serious condition with the diagnosis " food toxicoinfection, form 30?". From the anamnesis, it is known that she fell ill 20 minutes after eating fried mushrooms, which were treated by a neighbor. There was a strong, cramping pain in the stomach, indomitable vomiting, liquid, watery stool without counting. Increased weakness, dizziness and headache.

Objectively: dryness of the mucous membranes, turgor of the skin is reduced - the skin fold on the abdomen and hands straightens slowly, the sclera are icteric. BH 28 V min, blood PRESSURE 90/50 mm Hg. the Liver is increased by 2 cm, oligoanuria (urine 200 ml / day).

1. Your diagnosis?
2. Spend the differential diagnosis between cholera and similar diseases.
3. What are the tactics of urgent therapy?

Task 7

Patient K. 42 years old fell ill after drinking water from an open reservoir, while on a winter fishing trip. The next day, I felt weak, nausea, vomiting, cramp-like abdominal pain, frequent watery stool, foamy, bright yellow in color. Weakness was building.

Objectively: skin of normal color. Turgor is normal, marked by a loud rumbling in the stomach, which can be heard at a distance. Blood PRESSURE 110/70 mm Hg, pulse 87 beats per minute, rhythmic. The tongue is moist, covered. On the mucosa of the soft palate, palatal arches, and uvula, there is a moderate hyperemia and granularity. On palpation of the abdomen, there is little pain and rumbling in the paraumbilical region. The liver and spleen are not enlarged. Disuric phenomena no.

1. Put the diagnosis.
2. Differentiate with cholera.

STANDARDS OF ANSWERS TO SELF-MONITORING QUESTIONS

1. The last, seventh cholera pandemic caused by Holesnym the cholerae of the El tor biotype. The peculiarity of El-tor *Vibrio novae* is determined by their greater stability in the external environment compared to classic cholera *Vibrio* species. As a result, the *Vibrio cholerae* El tor can, under certain conditions, multiply in water outside the human body one.

2. Cholera is a cyclic infection with a predominant lesion of the enterocyte enzyme systems. Cholera vibrios that enter the small intestine multiply intensively on the surface of the mucous membrane or in the lumen, which is accompanied by the release of endo - and exotoxins. Exotoxin-cholero-gen, acting on

adenylate cyclase of cells of the intestinal mucosa, contributes to the strengthening of camp synthesis and increased secretion of electrolytes and water by enterocytes into the lumen of the small intestine, which causes the appearance of characteristic watery diarrhea and vomiting. In severe cases, the volume of losses can reach 30 liters / day. Extracellular isotonic dehydration develops (electrolytes and water are secreted into the lumen of the small intestine in a constant ratio). This leads to hypovolemia with blood clots and impaired microcirculation, the myocardium, renal tubules are affected, and intestinal paresis occurs.

3. early clinical signs of cholera include the sudden appearance of liquid stool, subsequent frequent vomiting without previous nausea and without bringing relief, the development of the disease against the background of normal body temperature, the absence of abdominal pain, rapid increase in dehydration.

4. Due to the loss of a large amount of fluid, the patient becomes dehydrated. The appearance of patients changes dramatically, their facial features become sharpened, their eyes become sunken, "dark glasses" under the eyes, and their sclera become dim. The skin becomes cyanotic, cold to the touch, the turgor of the skin decreases, the skin is easily collected in a non-healing fold. The more pronounced the dehydration, the longer the crease does not spread out. The fingers of the hands and feet are wrinkled, like the hands of a laundress. The voice becomes weak, hoarse, then the patient speaks only in a whisper. Later, full aphonia develops. There are spasms of the lower and upper extremities, especially the fingers and toes, and the calf muscles. Urination decreases sharply and develops oliguria (urine less than 700 ml / day), and then oligoanuria (urine less than 200 ml/day). Anuria may occur.

The breath becomes faster, the pulse is rapid, weak filling, barely palpable, and then disappears. HELL gradually falls and ceases to be defined. Heart tones are muted, and body temperature drops to subnormal levels.

The described manifestations can develop rapidly, from 3-12 to 24 hours from the onset of the disease.

5. Indicators of the acid-base state of capillary blood in healthy subjects (according to Astrup-Zinaard, - Andersen)

PH	BB, mmol/l	VE, mmol / mm Hg	RS02, mmol / mm Hg	SV, mmol / mm Hg	AB, mmol / mm Hg	R02, mmol / mm Hg		
7,35—7,45		30—63		1±2,3	30—35	18—26	18—26	80—100

Electrolytes in mmol / l: plasma sodium 135-150; red blood cell sodium 17.4-21.7; plasma potassium 3.9—6.0; red blood cell potassium 70.5-112.

The hematocrit index is 38-45% (0.38—0.45 l/l).

When dehydration occurs, cholera patients develop tissue hypoxia, metabolic acidosis and hypokalemia.

6. Dehydration is divided by severity into 4 degrees. They have clear clinical symptoms and certain pathophysiological signs (table 3).

7 to confirm the diagnosis, assess the degree of dehydration and prescribe adequate rehydration therapy, as well as etiological decoding of the disease, it is necessary to conduct the following:

- a) details to collect the anamnesis of the disease, the anamnesis carefully and objectively to examine the patient;
- b) weigh the patient and determine the degree of dehydration based on clinical data;
- c) determine the volume of bowel movements and vomit on an hourly schedule;
- g) conduct hourly measurement of urine output;
- d) to determine the index of the hematocrit, the content of electrolytes in the blood and indicators of KOS;
- f) collect feces and vomit for bacteriological research.

8. Excreta and vomit for bacteriological examination should be taken immediately. Secretions in the volume of 20-50 ml are placed with a spoon in sterile glass jars with lids, then packed in a plastic bag and transported in a metal container to a bacteriological laboratory. You need a clear referral with the patient's full name, surname, and doctor's name, date and time of material collection, and diagnosis. Each treatment facility has appropriate instructions.

9. I can recall the cholera, foodborne diseases, intestinal infections caused by the so-called deagglomerates vibrios (NAG) infection, rotavirus gastroenteritis, and acute intestinal syndrome in yavleniyah caused by poisonous mushrooms and chemical substances (tab. 1, 2). You may be thinking about cholera in acute surgical disease — thin high intestinal obstruction.

10. Water-salt therapy should begin as early as possible, if possible at the pre-hospital stage. The volume of liquid required for rehydration is set depending on the degree of dehydration and is introduced as follows:

The criterion for the adequacy of therapy is the appearance of urination in patients (against the background of normalization of clinical and laboratory data). Intravenous fluid administration stops when the volume of urine released over 2 hours begins to exceed the volume of stool over the same time. The predominance of the volume of urine over the volume of feces occurs 6-12 hours before the normalization of stool. Chair

Degree of dehydration	Loss of body mass, %	Introduction of liquid
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I	Up to 3	through the mouth or intravenously drip Intravenously at the rate of 40-65 ml/kg of body weight for the first 15-20 minutes, the rate of administration is 80-90 ml/min, then intravenously drip, and then in quantities equal to losses Jet intravenous liquid injection at the rate of 70-100ml/kg with a speed of 100-130 ml/min for the first 30-45 min. Usually for 1-1.5 hours, at least 5-7 liters of solution is introduced. Further introduction of drip in accordance with the fluid loss and the data of clinical-physiological studies of
II	4-6	
III	7-9	
IV	10 and more	

it still retains its watery character, but vomiting must necessarily stop, since otherwise it is impossible to switch to oral liquid administration. If patients do not show signs of hypovolemic shock, therapy can be continued orally or through a nasogastric tube.

Ready-made attachments of salt composition are dissolved in drinking water at a temperature of 40-42°C and give the patient to drink 1 liter per hour.

During intravenous rehydration, the following complications are possible: pyrogenic reactions, phlebitis and thrombophlebitis, General hyperhydration, hypernatremia, hypokalemia, alkalosis.

For oral rehydration, there are practically no contraindications. It is shown to all cholera patients at the pre-hospital stage. Even patients with severe dehydration (if there are no infusion solutions) are constantly given liquid in small portions of 200 ml after 15 minutes.

However, when dehydration of III—IV degree, the presence of hypovolemic shock should be carried out adequate intravenous rehydration. It should be remembered that patients suffering from diabetes should be prescribed solutions that do not contain glucose.

12. Saline solutions for intravenous administration,

The name of the drug	Sodium acetate	Sodium bicarbonate	Sodium chlorid	Potassium chlorid	Calcium chlorid	Sodium lactate	Magnesium chlorid	Water (non-pyrogenic)
in grams/liter								
				1,5	-	-	-	1000

Quadrisol	2,6	1,0	4,75	1,0	-	-	-	1000
Trisol	-	4,0	5,0	-	-	-	-	1000
Disol	-	2,0	6,0	1,5	-	-	-	1000
Chlosol	3,6	-	4,75	1,0	-	-	-	1000
Acesol	2,0	-	5,0	0,3	0,16	3,4	0,1	1000
Lacteal	-	0,3	6,1					

**Composition of glucose-salt solutions for oral rehydration (ORS)
(in grams of l)**

The Composition	Of The Company Galaktika	Glyukosolan	Tsitraglyukosolan	Regidron
Sodium chloride	3,5	3,5	3,5	3,5
	-	2,5	-	-
Sodium bicarbonate	2,9	-	4,0	2,9
	2,5	1,5	2,5	2,5
Sodium citrate	-	20,0	17,0	10,0
Potassium chloride	50,0	-	-	-
	11	11	11	11
Glucose				
Rice flour				
Drinking water				

13; discharge of persons who have suffered from cholera is made after their full recovery, completion of the course of antibiotic therapy and receiving negative results of bacteriological research (usually on the 8-10 th day).

Bacteriological examination before discharge from the hospital is prescribed 24-36 hours after the end of treatment with antibiotics and is carried out for 3 consecutive days. The study is subject to stool (three times) and bile (portions B and C) (once). Individuals of the decreed groups, as well as patients with chronic liver disease and biliary tract diseases are subject to a 5-fold examination for 5 days (stool) and a single examination of bile.

14. when identifying a patient with cholera in an epidemic focus, the following set of anti-epidemic measures is carried out:

- 1) mandatory hospitalization, examination and treatment of cholera patients and Vibrio carriers;
- 2) active detection of cases by making house-to-house (apartment-to-apartment) rounds;
- 3) hospitalization and examination for cholera of all patients with acute gastrointestinal diseases;
- 4) identification of contact persons, medical supervision, at home for 5 days, with a single bacteriological examination, isolation of them in case of illness;
- 5) current and final disinfection (all things, items, linen are carried out by the disinfection service);
- 6) epidemiological examination in the focus (conducted by an epidemiologist);
- 7) sanitary and hygienic measures and sanitary and educational work (when conducting sanitary and educational work, you need to pay attention to the need for an early examination by a doctor, the harm of self-medication, etc.)

THE ANSWERS TO THE CONTROL TASKS

To task 1

1. Clarify the sequence of appearance of liquid stool and vomiting, the nature of feces and vomit, the presence or absence of pathological impurities in the feces, B abdominal pain, fever, as well as the data of the epidanamnesis.

2. the Sudden appearance of liquid watery stools without abdominal pain, the presence of vomiting that does not bring relief and without previous nausea, a rapid increase in symptoms of dehydration against a normal temperature, as well as the patient's stay in a region unfavorable for cholera (returned from the Astrakhan region), suggest that the patient has cholera.

3. Using the table of clinical and pathogenetic classification of dehydration, it is possible to diagnose IV stages of dehydration: stool more than 20 times, limb spasms, a symptom of "dark glasses", pulse threadlike, blood PRESSURE below 80 mm Hg, anuria.

4. For foodborne illness is characterized by abdominal pain, diarrhea has a bad smell. The disease is usually accompanied by fever. It should be remembered that in severe food toxicoinfection, dehydration can reach the same degree as in cholera. In dysentery, the disease begins with the appearance of pain in the lower abdomen or in the left iliac region. Stool is frequent, but scanty, characterized by an admixture of mucus and blood. The patient is disturbed by false urges, tenesmus. On palpation, there is spasm and tenderness of the sigmoid **colon**.

5. the doctor's Performance is unsatisfactory: **оценен** the severity of the disease (determined by the degree of dehydration) was incorrectly assessed and, accordingly, adequate rehydration therapy was not prescribed.

To task 2

1. the Preliminary diagnosis and degree of dehydration are constated in the same way as suggested in taskния 1: "cholera, grade IV dehydration."

2. When identifying a patient with cholera, arrived airtransport, it is necessary:

a) hospitalize the patient, preferably by ambulance with a medical team;

b) identify and rewrite persons who came into contact with the patient;

c) report to the sanitary control point (UPC)

station's.

3. the Volume of initial infusion is calculated based on the fact that grade IV dehydration corresponds to a loss of liquidbone up to 10% of body weight. So, at the initial body weight of 70 kg (the loss was 10%), it is necessary to prescribe 7 liters of saline solution (kvartasol, etc.) and furthercorrect the loss.

4. in the Department where the patient is delivered (infectious, intensive care, resuscitation), determine the hematocrit index, electrolyte exchange, CBS. If metabolic acidosis and hemoconcentration persist, therapysould be considered inadequate.

To task 3

1. a patient's preliminary diagnosis canonly be made based on epidemiological data (contact with a cholera patient, as well as stay in an area endemic to cholera). It's probably cholera.

2. Since the patient has weakness and dry mouth, you should think about the I degree of dehydration and assign oral rehydration with one of the solutions in an amount of 3% of body weight. The patient weighed 80 kg before the disease, therefore, he should drink 2.4 liters of solution at a rate of 1 liter per hour.

3. the Patient should be hospitalized inan infectious disease hospital with suspected cholera, and should be examinedonly physiologically. When the symptoms of dehydration increase and signs of hypovolemic shock appear, it is necessary to switch to intravenous rehydration solutions.

T a s k 4

1. There are clinical signs of hypokalemia and acute renal failure. The main cause of acute kidney injury in cholera is prolonged hypovolemia and hypotension due to insufficient elimination of dehydration.

2. It is necessary to constantly measure diuresis, determine the level of urea and creatinine in the blood. To confirm hypokalemia, it is necessary to determine the content of potassium in plasma and red blood cells, make an ECG. Plasma potassium and trocyte ERIwill be reduced, on the ECG-prolongation of the QT interval, flattening of The t-wave, downward displacement of the ST, the appearance of the U-wave.

3. After full compensation of fluid loss, it is necessary to prescribe forced diuresis, enter a 15% solution of mannitol in the amount of 1 -1.5 g per 1 kg of body weight.

4. To combat hypokalemia, additional administration of potassium salts should be prescribed.

The volume of the required amount of 1% potassium chloride solution is determined by the formula:

R. 1.44 - Megabyte (5-X) = D,

where D —the desired volume of 1% potassium chloride in ml, P —the patient's body weight in kg, X-the concentration of K in the patient's blood plasma in mmol/l, 5 — the normal concentration of potassium. 1.44-coefficient).

To t a s k 5

1. Cholera. Dehydration of the third degree, and then IV. The patient came from a cholera-affected area. Liquid stool preceded vomiting; dry skin and mucous membranes, tachycardia, a decrease in blood PRESSURE, and ongoing losses also confirm cholera.

A differential diagnosis with food toxicoinfection should be made (table 2). there is no Data for food toxicoinfection, the doctors of the medical center and ambulance were confused by a slight abdominal pain on palpation and the patient's pointing at the use of stale sausage,

2 with the introduction of Pressor amines, there is a primary spasm of the precapillaries, leading to irreversible violations of hemodynamics. Pressor amines seisonaut renal capillaries, contributing to the development of AKI. The main thing in the treatment of cholera patients is to compensate for fluid losses, combat hemoconcentration and eliminate total peripheral resistance.

3. With its high oncotic pressure, colloid- ing solutions (gemodez) increase intracellular dehydration. Glucose solution is not able to correct metabolic shifts and electrolyte deficiencies.

4. At III—IV degree of dehydration, there is a loss of fluid in the volume of 7-10% of body weight. On average, this is 9%. If the patient's weight is 80 kg, then the patient needs to pour 72 liters of salt solutions. In the future, losses should be corrected if they continue.

To t a s k 6

1. Diagnosis: "pale toadstool poisoning, toxic hepatitis, liver and kidney failure".

2. Taking into account the presence of liquid stool, vomiting and signs of dehydration, a differential diagnosis should be made with cholera, food toxicoinfections, dysentery, as well as some chemical poisoning (tables 1 and 2).

1. Transfer to the hemodialysis Department.

Z a d a n i a 7

1. Diagnosis of "rotavirus gastroenteritis" based on the characteristic clinical picture — temperature, symptoms of gastroenteritis, abdominal pain, the nature of the stool—foamy, bright yellow, loud rumbling in the intestines, as well as damage to the oropharyngeal mucosa-hyperemia and granularity in the soft palate.

2. The above signs are not characteristic of cholera (table 1).

Degrees of dehydration in acute intestinal infections (according to V. I. Pokrovsky, 1978)

symptoms	The degree of dehydration			
	I	II	III	IV
	The amount of fluid loss relative to body weight			
	UP to 3%	4-6%	7-9%	over 10%
Vomiting	Up to 5 times	Up to 10 times	Up to 20 times	More than 20 times
Liquid stool	Up to 10 times	From 10 to 20 times	20 times or more	More than 20 times

Thirst, dryness of the oral mucosa	Moderate	Significant		Sharp
Cyanosis	No	Nasolabial triangle	Acrocyanosis	Common cyanosis
Skin elasticity and turgor of subcutaneous tissue	Normal ones	Reduced for older people- ЛЫХ	Lowered	Dramatically reduced
voice Change	No	Weakened	Hoarseness	Of Afonia
Cramps	No	Calf muscles, briefly-temporary	Prolonged and painful periods	Generalized, clonal
Pulse	Rate	Up to 100 beats per minute	Up to 120 beats per minute	Filamentous or not defined
Systolic blood-pressure	The norm	is Up to 100 mm Hg. art	. up to 80 mm Hg.	Below 80 mm Hg. for example, sometimes you do not define* Diuresis
Diuresis	The norm	Oliguria	Oligoanuria	Anuria
Index haematocrit of	38-45% (0.38 to 0.45 l/l)	45-50% (0.45—0.50 l/l)	50-55% (0.50-0.55 l/l)	More than 55 percent (0.55 or more l/l)
The pH value of the blood	of 7.36—7,40	of 7.36—7,40	7,30—of 7.36	Less than 7.30
base Deficits (BE)	The norm	Up to 5 mmol/l	Up to 10 mmol/l	More than 10 mmol/l
Violation of electrolyte metabolism	The norm	Potassium reduction	The decrease of potassium and sodium	A sharp decline in the national currency