

COMPLEX METHOD OF LABORATORY DIAGNOSTICS OF THE SKIN FORM OF INTESTINAL YERSINIOSIS

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✓ Resume

Laboratory diagnostics of yersiniosis remains relevant for practical health care now. Wide circulation and the expressed variety of clinical options of an yersiniosis define difficulties of recognition of this disease and the considerable frequency of diagnostic mistakes. Yersiniosis has a similar clinical picture with many diseases. Establishment of the etiology of an yersiniosis infection is possible only as a result of performing complex clinical laboratory diagnostics.

Keywords: *intestinal yersiniosis, Y. enterocolitica, laboratory diagnostics.*

ПРИМЕНЕНИЕ ПРИ КОЖНОЙ ФОРМЕ КИШЕЧНОГО ИЕРСИНИОЗА КОМПЛЕКСНОГО МЕТОДА ЛАБОРАТОРНОЙ ДИАГНОСТИКИ

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✓ Резюме

Лабораторная диагностика иерсиниозов в настоящее время остается актуальной для практического здравоохранения. Широкое распространение и выраженное разнообразие клинических вариантов иерсиниоза определяют трудности распознавания данного заболевания и значительную частоту диагностических ошибок. Иерсиниоз имеет сходную клиническую картину со многими заболеваниями. Установление природы иерсиниозной инфекции возможно только в результате проведения комплексной клинико-лабораторной диагностики.

Ключевые слова: *кишечный иерсиниоз, Y. enterocolitica, лабораторная диагностика.*

LABORATORIYA DIAGNOSTIKASINING MURAKKAB USULINI ICHAKDAGI IERSINIOZNING TERI SHAKLIDA QO'LLASH

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✓ Rezyume

Yersiniozning laboratoriya diagnostikasi hozirgi kunda amaliy tibbiy yordam uchun dolzarb bo'lib qolmoqda. Yersiniozning keng tarqalgan va aniq klinik variantlari ushbu kasallikni aniqlashdagi qiyinchiliklarni va diagnostika xatolarining muhim chastotasini aniqlaydi. Yersinioz ko'plab kasalliklarga o'xshash klinik ko'rinishga ega.

Kalit so'zlar: *ichak yersiniozi, Y. enterokolitika, laboratoriya diagnostikasi.*

Relevance

The problem of yersiniosis has arisen already today, during recent history, being a clear example of the problem of the so-called emerging zoonoses, that is, the emergence of new infectious diseases dangerous for humans. Yersiniosis also confirms that new infections that have not yet adapted to exist in a new niche for the pathogen (the human body) do not have clearly defined clinical symptoms, are characterized by the absence of pathognomonic

features and vagueness (polymorphism) of the clinical picture.

Diagnosis of yersiniosis currently remains relevant for practical health care. The widespread and pronounced variety of clinical variants of yersiniosis determine the difficulties in recognizing this disease and a significant frequency of diagnostic errors. Yersiniosis has a similar clinical picture with many diseases [1,2].

Установлено, что у так называемого «здорового» человека обнаруживаются маркеры иерсиний, вызывающие длительное маломанифестное заболевание или бессимптомное носительство, которые могут привести к серьезным осложнениям [2]. Иерсиниозы - это третья по распространенности зоонозная инфекция в Европе, хотя число сообщений об этих случаях у людей уменьшилось с 2006 года [3]. Сообщения об изоляции иерсиний, в основном, касаются *Yersinia enterocolitica* [4, 5].

It must be assumed that the official incidence rates of yersiniosis are underestimated due to fragmentary diagnostic studies. Lack of objective information can cause complications of the epidemiological situation in individual territories and in the country as a whole. In Kazakhstan, it is necessary to change the situation with regard to laboratory diagnostics of these infections; special and urgent attention is required to activate work on the introduction of modern methods of indication and identification of *Yersinia*, both for improving the verification of diagnoses of yersiniosis, occurring with a variety of symptoms and syndromes, and for epidemiological studies.

Establishing the nature of yersiniosis infection is possible only as a result of complex clinical laboratory diagnostics using specific methods of analysis.

Yersiniosis is an acute anthroponozoonotic intestinal infection with the fecal-oral route of transmission, distinguished by its multi-focal nature, accompanied by a toxic-allergic reaction. The incubation period of yersiniosis lasts no more than a week. The clinic consists of a general toxic syndrome, maculopapular rashes, dyspeptic disorders; possible hepatosplenomegaly, arthropathic syndrome, development of acute appendicitis, generalized form of yersiniosis. The diagnosis is established on the basis of laboratory confirmation, taking into account clinical and anamnestic data.

The disease is caused by the bacterium *Y. enterocolitica*, which enters the body with various foods. The reservoir and source of the pathogen are rodents, livestock, dogs. *Yersinia* was distinguished from almost all possible animals - mammals, birds, fish, reptiles and amphibians, from blood-sucking carriers (fleas, ticks) in different climatic and geographical zones. The waterway of transmission is not excluded, when using water from open water sources. In cities, the infection is mainly carried

by rodents, which form epidemic foci of infection during periods of outbreaks.

Epidemic outbreaks of yersiniosis are quite rare and most often occur with the massive consumption of vegetables contaminated with microbes. Yersiniosis is transmitted by the fecal-oral mechanism through food and water. Food products of animal origin, insufficiently processed thermally, water sources contaminated with feces of sick animals, contribute to the implementation of infection routes. In rare cases, there is a contact-household transmission path. When a person consumes products that have not been previously thermally processed, the bacteria *Y. enterocolitica* enter the gastrointestinal tract, then into the circulatory and lymphatic systems and are carried by the blood and lymph flow. Of interest is the case of the cutaneous form of intestinal yersiniosis, the description of which is given in this communication. The laboratory and etiological study of this case was carried out by a complex method, since the clinical picture of many zoonotic infections is polymorphic.

The purpose of the research. Laboratory and etiological study of a case of cutaneous yersiniosis by a complex method.

Material and methods

Material for research: throat swab, blood, urine, feces.

Research methods: PCR diagnostics, clinical and epidemiological, bacteriological; serological. A complex laboratory research method was used [6].

Liquid storage media: Hottinger's broth with the addition of 1% hemolyzed blood (for the isolation of *Listeria* and *Pasteurella*) and phosphate buffered saline (for the isolation of *Yersinia*). A feature of the complex method is the simultaneous incubation of crops under the conditions of a thermostat (thermostatic tests), which ensures the rapid growth of microorganisms and in a refrigerator (cold samples), which provides a significant suppression of the growth of extraneous microflora. Selective differential medium Endo (in search of *Yersinia*) and Hottinger's agar with the addition of 1.0% hemolyzed blood (in search of *Listeria* and *Pasteurella*).

The study of biological properties was carried out in accordance with the rules of work in accordance with the approved orders or guidelines.

The isolated culture of *Yersinia* was also studied by PCR using the GenPak DNA PCR test kit for intestinal yersiniosis.

Result and discussion

The case occurred in September: patient M., 60 years old, 3 days after lunch in a cafe, there was an increase in temperature up to 38 ° C, unexpressed sore throat. The symptomatology was not pronounced. Then a rash appeared, first on the lateral surfaces of the lower extremities, then on the upper extremities: a pinkish-red



Fig. No. 1. - Skin lesions in patient M.

No growth characteristic of *Listeria* and *Pasteurella* was found from broth inoculations followed by inoculation on Hottinger agar with hemolyzed blood. Antibodies to the causative agents of listeriosis and pasteurellosis were not detected in the patient's serum in serological reactions (indirect hemagglutination reaction - RNGA). Thus, the study for the presence of other zoonotic infections, which was carried out in the complex, was negative.

On Endo's medium, after plating from phosphate buffer (cold sample) of feces, colorless colonies grew; in transmitted light, they were transparent with an even edge.

In smears, polymorphism was noted: rods with rounded ends (0.8-1.2 microns long, 0.5-0.8 microns wide) or an ovoid shape with bipolar staining; according to Gram, the cells were not stained.

These lactose-negative colonies were seeded on Ressel's medium with urea. After 24 hours of incubation at 37 ° C, due to the hydrolysis of urea, the Ressel medium turned crimson. The putative enterobacteria, which include *Yersinia*, had a positive urease; on the Ressel medium, the relation to lactose and glucose was not visible due to the hydrolysis of urea; gassing and formation of hydrogen sulfide was not observed.

The isolated culture did not possess phenylalanine deaminase, fermented mannitol and maltose, which made it possible to distinguish the genus *Yersinia* from *Proteus*.

rash, spotted exanthema, slightly itchy. Having existed for 5-6 days, the rash faded, foci of desquamation began to appear (Fig. 1).

To confirm the diagnosis, a comprehensive laboratory study of the material was used due to the blurred clinical manifestations, unexpressed symptoms characteristic of both yersiniosis and other infectious diseases (listeriosis, pasteurellosis), taking into account data from an epidemiological history (eating food in public catering).

5% and was not lysed by a pseudotuberculosis bacteriophage.

In the aggregate of all biochemical tests - the breakdown of glucose, maltose, mannitol, the lack of activity against lactose, the ability to hydrolyze urea, the inability to form hydrogen sulfide, the absence of phenylalanine deaminase, allowed to expose laboratory confirmation - *Yersinia*.

The type of *Yersinia* was determined taking into account the results of interspecific differentiation, namely: the absence of fermentation of rhamnose, raffinose, fermentation of sucrose, inability to assimilate Simons citrate and the presence of indole. Thus, the culture of *Y. enterocolitica* was isolated.

Serological diagnostics also confirmed the diagnosis of intestinal yersiniosis. In the RNGA, antibodies to the causative agent of intestinal yersiniosis were determined at first in a titer of 1: 100, after 7 days - 1: 200.

The antibioticogram revealed the sensitivity of the isolated culture of intestinal yersiniosis to ampicillin, amoxicillin, gentamicin, ciprofloxacin, ofloxacin.

The isolated culture was also studied by PCR and had a 373 bp DNA fragment specific for intestinal yersiniosis.

To confirm the diagnosis, a comprehensive laboratory study of the material was used due to unexpressed symptoms, with manifestations that occur both in yersiniosis and in other infectious

diseases (listeriosis, pasteurellosis), taking into account data from an epidemiological anamnesis. A comprehensive method of laboratory research, which allows to detect several pathogens in the same material, made it possible to isolate *Yersinia enterocolitica* and confirm the diagnosis of intestinal yersiniosis with cutaneous manifestations.

Output

An effective scheme for a comprehensive laboratory study in search of pathogens of yersiniosis, listeriosis, pasteurellosis in one material made it possible to give an etiological interpretation of the disease with polymorphic clinical manifestations.

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