CASE STUDY

CLINICAL CASE OF EDWARDSIELLOSIS IN UKRAINE

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ABSTRACT

Edwardsiellosis is a zoonotic infectious disease that caused by Edwardsiella tarda and characterized by gastroenteritis in humans. Contaminated water can also be a source of infection. Primary nutritional toxicity clinical signs may mask aquatic zoonosis caused by *Edwardsiella tarda*. Infectious border control should ensure that the import into Ukraine of such preservatives of food products, highly probably infected by this agent is not allowed.

KEY WORDS: Edwardsiella tarda, gastroenteritis, African male, exotic disease, Ukraine

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INTRODUCTION

In Ukraine, not a single clinical case of Edwardsiellosis has been described yet. Edwardsiellosis is a zoonotic infectious disease that caused by *Edwardsiella tarda* and characterized by gastroenteritis in humans [1-3]. It has also been implicated in meningitis, biliary tract infections, peritonitis, liver and intra-abdominal abscesses, wound infections and septicaemia [4-10]. It has been often isolated from catfish fillets in processing plants and can spread to man via the oral route or a penetrating wound [11]. Contaminated water can also be a source of infection.

CLINICAL CASE

A student from Ghana, 22 years old, on the 3rd day of illness was hospitalized to the infectious disease unit of the Municipal Institution "Chernivtsi Regional Clinical Hospital" in Chernivtsi. Diagnosis on admission: food bacterial poisoning of moderate severity. Complaints – cramping abdominal pain, nausea, fever, fluid feces up to 5 times per day, general weakness. He associated his malaise with eating the seafood soup, which he has cooked by himself from a package given by his brother from Ghana.

An objective examination: body temperature 37.8 °C, pulse 92 beats per min, regular. AP 100/60 mm Hg. Tones of the heart are sound. Tongue is wet, furred. The abdomen is soft, rumbling, and painful along the intestine, mostly in the right iliac section. Stool is liquid without pathological admixture, badly smelling. He was consulted by a surgeon who had ruled out anyacute surgical pathology.

The next day the patient's condition began to improve: body temperature was normalized, abdominal pain decreased, but general weakness, poor appetite still remained. After 2 days the patient's condition was satisfactory, bowel movements were normalized, abdominal pain disappeared.

The patient has undergone general-clinical and bacteriological examination of feces. In the general analysis of blood, the shift of the leucocyte formula to the left was detected by increasing the cell-nuclear neutrophils to 26%. *Edwardsiella tarda* is isolated in the bacteriological culture method from feces.

While in hospital, the patient received the following treatment: a Trisolum solution, Rheosorbilact, Rehidron, Nifuroxazide, Norfloxacin, Enterosgel, Spasmalgon.

In the hospital, the patient spent five bed-days, and discharged in satisfactory condition with clinical recovery.

Edwardsiella tarda is a motile, facultatively anaerobic, Gram-negative rod that is categorized as a member of the family Enterobacteriaceae. The genus *Edwardsiella* was first recognized by Trabulsi et al in 1962, followed by a description of *E. tarda* in the mid-1960s. These organisms have successively been named the "Bartholomew group" by King and Adler, the "Asakusa group" by Sakazaki and "Edwardsiella" by Ewing et al.

The genus *Edwardsiella* comprises a genetically distinct taxon weakly related to other members of the Enterobacteriaceae. It consists of bacteria differing strongly in their biochemical and physiological features, natural habitats, and pathogenic properties. The most common species of the genus is E. tarda, which was already described in 1965. Although it has been recovered from a variety of environmental and animal sources, E. tarda is predominantly found in freshwater and fish. Humans are regarded to be occasional hosts but are prone to serious diseases due to this organism. Most frequently, *E. tarda* causes gastroenteritis presenting as acute watery diarrhea resembling that produced by other toxigenic enteropathogens, but dysentery-like courses also occur. Immunocompromised patients, older adults, and children are predominantly affected. Extraintestinal infections such as septicemia - with a mortality rate near 50% - and wound

infections have also been reported. Exceptionally, *E. tarda* has also been found to cause meningitis, peritonitis, osteomyelitis, and liver abscesses. In 1980, a second *Edwardsiella* species was proposed by Grimont et al. and was named *E. hoshinae*. In contrast to *E. tarda, E. hoshinae* is found in relatively few ecological niches (i.e., birds, reptiles, and water). Although *E. hoshinae* has been isolated from human feces, its role as a human or animal pathogen has not been established. The third *Edwardsiella* species was created in 1981 and was called *E. ictaluri. E. ictaluri* shows unusual properties: Apart from having a low optimal growth temperature, this organism has been predominantly isolated from channel catfish, in which it causes fatal systemic infections known as enteric septicemia. Human infections due to *E. ictaluri* are not known; however, virulence-associated properties such as serum resistance, indicating the potential to cause human disease, have been documented for all *Edwardsiella* species.

E. tarda is typically isolated from fresh or brackish water environments such as river mouths. It has also been isolated from the intestines of humans (after eating fresh water food sources such as catfish or eels) and from animals, including reptiles and freshwater fish.

Of the three recognized species, only *Edwardsiella tarda* has been demonstrated to be pathogenic for humans. Chief infections associated with this species include bacterial gastroenteritis, wound infections such as cellulitis or gas gangrene associated with trauma to mucosal surfaces, and systemic disease such as septicemia, meningitis, cholecystitis, and osteomyelitis. Risk factors that are associated with *E. tarda* infections include exposure to aquatic environments or exotic animals (e.g., reptiles or amphibia), preexisting liver disease, conditions leading to iron overload, and dietary habits (e.g., raw fish ingestion). Although studies indicate that this bacterium is susceptible to most commonly prescribed antibiotics, fatal gastrointestinal and extraintestinal infections have been described.

The source and reservoir are fresh and salty waters, fish, reptiles. The path of infection of people is water and food, a predominant risk factor – consuming raw or underexposed fish, intestines that are contaminated.

The main clinical manifestations (according to the described 72 cases are bacterial gastroenteritis, bacteremia caused by *Edwardsiella*, meningitis, cholecystitis, osteomyelitis, hepatic abscess). Fatal gastrointestinal and extra-intestinal forms are described. Case fatality rate is 44.6-61.1%. Concomitant liver cirrhosis is determined as an independent risk factor associated with a fatal outcome [12].

Pathogenic bacteria may have virulence genes that are absent in nonpathogenic bacteria, making them virulent. Virulence genes may also be present in both pathogenic and nonpathogenic bacteria but may be functional only in pathogenic ones. It has been reported that seven genes, named *orfA*, *fimA*, *gadD*, *katB*, *mukF*, *ssrB*, and *gyrB* were specific to pathogenic *E. tarda* [13, 14].

CONCLUSIONS

This clinical case of rare zoonotic infectious disease one more time proved that there is no borders for infection as general pathogenic concept. Migration and globalization of infectious pathology is a new reality. Classical bacteriological investigation of patient with gastrointestinal disorder is necessary for the obtaining of pure culture and final confirmation of etiologic diagnosis. Attentive epidemic history taking is essential in the formation of hypothesis according to presumptive clinical diagnosis. For the purpose of general prevention of this disease, it is a strongly recommended to conduct a sufficient heat treatment when seafood consumed. Primary nutritional toxicity clinical signs may mask aquatic zoonosis caused by *Edwardsiella tarda*. Infectious border control should ensure that the import into Ukraine of such preservatives of food products, highly probably infected by this agent is not allowed.

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Conflict of interest:
The Authors declare no conflict of interest.

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