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RETROSPECTIVE ANALYSIS OF NON-TYPHOIDAL SALMONELLA INFECTIONS AT BUKOVYNA FOR THE PERIOD SINCE 2011 UNTIL 2015

Key words: *retrospective analysis, gastrointestinal salmonellosis, non-typhoid Salmonella, integrative indicators of intoxication, sporadic morbidity, outbreak, Bukovyna.*

Abstracts. *It has been analyzed clinical, epidemiological and microbiological aspects of gastrointestinal salmonellosis in Bukovyna caused by S. enteritidis, S. typhimurium, S. newport, S. essen, S. london and other groups over the past five years. The microbial spectrum of combined intestinal infection included representatives of Staphylococcus, Proteus, Pseudomonas, Candida, Shigella, Citrobacter families as well as Rotavirus have been detected. The determination of integrated markers of endogenous intoxication allowed to confirm their significant elevation in acute illness period in all cases, especially in cases with mixed acute intestinal diseases ($p < 0,05$).*

Introduction

Actually, the problem of acute intestinal infections is crucial in many developed and still developing countries; however, the epidemiologic situation with a prevalence of non-typhoid salmonella infections (NTS) caused infectious diseases in countries of Eastern Europe had changed annually [8, 9, 10].

NTS among all acute intestinal infectious diseases in the etiological structure is the most numerous, even in highly developed countries. Moreover, in the USA, according to the Center for Disease Control, the incidence of salmonellosis each year result in 19,000 cases of hospitalisation and a few lethal cases [2, 4]. According to the National Veterinary Institute in Sweden, the situation in Europe with food safety and control of animals according to zoonoses is far from being resolved, for example, in 2013 there was 2,838 officially reported confirmed cases of human infection caused by pathogenic salmonella [6].

The unstable socio-economic situation and a slowdown quality of health care reforming in Ukraine can be considered as indirect external factors in the lack of supervision system for objects of food industry, livestock and individuals belonged to decreed group [1, 3, 5]. Official statistics of an incidence rate of salmonellosis in Ukraine is probably underestimated due to some organizational obstacles [7]. Unfortunately, at the present time it is difficult to establish an etiological factor that could be realized near in 55-80% of patients [10]. The main method of laboratory confirmation of diagnosis is stool culture test.

The research purpose is to study the clinical, epidemiological and microbiological features of NTS at Bukovyna region over the last five years (2011-2015) based upon retrospective analysis method, and to determine the regional characteristics of infectious diseases specified nowadays, improving the effectiveness of holiatry and epidemiological control.

Materials and Methods

It has been analyzed totally 374 cases of gastrointestinal salmonellosis based on a retrospective analysis of the "Patient' medical history and stationary card" of all hospitalized to the Department of infectious diseases during the period from 2011 to 2015. Diagnosis had established based on the summary of clinical and epidemiological data, results of stool culture investigation, and rarely the data of immunoassay and ELISA in case of rotaviruses verification.

In the majority of enrolled cases there were diagnosed a gastroenteric clinical form (in 73% of cases) and gastroenterocolitic form (in 27% of cases), and 2 patients - with verified acute carrier (with the release of antibiotic-resistant strain of Salmonella enteritidis up to 3 months after admission time). For bacteriological study stool samples were taken and seed into appropriate culture media by classical method. Moreover, by the approved protocol of investigation for patients with diaarhea it is obligatory to check up the susceptibility of Salmonella clinical strain to

antimicrobial agents and antibiotics.

Discussion of results

It have been treated 374 patients at the Department of intestinal infectious diseases of Municipal Chernivtsi Clinical Hospital during the period of 2011-2015 years, and all enrolled into present retrospective study had positive outcome as recovery. By the clinical description, all Salmonella infected persons had typical clinical course, that described in guidelines and other data sources [2, 9]. Average hospital stay rate was 11,67 days. The peak of admission noticed from June to October that generally is usual for the Northern hemisphere for intestinal infections.

Most patients (63,2%-78,4%) had appealed for medical advice and had admitted within 72 hours of an illness onset annually. It had determined that only in 13,5% - 32,2% patients, admission happened on the first day of an illness. Late hospitalization (later than 72 hours, on 4-5 days), had noticed in 4,6% - 9,4% cases. A development of clinically complicated course of gastrointestinal salmonellosis such as acute renal failure and hypovolemic shock II degree had diagnosed in five patients per research period time.

According to detailed questioning done by specialists, an epidemiological history revealed that 38 cases (near 10%) the illness associated with the consumption of raw hen eggs. In a 1/3 of patients a history of various food consumption observed; the rest cases corellated with the consumption of meat products (smoked chicken "barbecue", mixed salads with meat). 54 (15%) patients reported about additional consumption of dairy products and confectionery.

Clinical moderate severity prevailed among all hospitalized while severe salmonellosis was observed in 5 persons.

In all patients with an acute onset symptoms of intoxication (headache, weakness), fever of subfebrile degree had observed in 143 (37,6%) patients, febrile fever - in 208 (54,8%), and fever above 39° C - in 29 (7,6%). All mentioned above symptoms had accompanied with dyspepsia - nausea, repeated vomiting, epigastric pain with periumbilical and right iliac region location. The last bothered by frequent liquid stool 8-10 times a day, greenish with an unpleasant smell, and in 36 (9,5%) patients - stool mixed with mucus. Well-known signs of dehydration I-II degree observed in most patients. Unfortunately, five persons hospitalized at fourth-fifth day of an illness onset a duty physician had marked signs of severe progressed dehydration with development of acute renal failure (oliguria stage).

Comprehensive treatment of hospitalized patients had conducted under generally accepted recommendations that include detoxication, rehydration therapy with parenteral and oral saline solutions, substitute enzyme therapy, antibacterial drugs (nitrofurans with quinolons), probiotics (pre- with probiotic). After holiatry patients gradually improved condition: fever retained an average within 2-3 days, gradually decreasing symptoms of intoxication, and after 3-4 days of treatment stool became to normal.

In rare cases abdominal discomfort and general weakness still were noticed. Salmonella pathogen has a specific property to invade gallbladder for long-term persistence [5]. Unfortunately, after first line antimicrobials prescription, in a few persons infected by Salmonella enteritidis, the second stool culture test had demonstrated the positive salmonella culture. Multi-drug resistance of salmonellas became threaten for scientists throughout the world [2]. Thus protocols Moreover, such persons were need one more course of antibiotics to provide effective eradication of this pathogenic bacterium.

Overall, in 2011 year 74 patients were hospitalized at the Department of Intestinal infectious diseases of Municipal Clinical Chernivtsi Hospital, only 10 sick (13,5%) among them were habitants of rural area of Chernivtsi region. In one case gastrointestinal salmonellosis caused by Salmonella enteritidis was combined with shigellosis caused by Shigella sonnei, and in three cases, while isolated pathogenic staphylococci and rotavirus.

The morbidity rate of 2012 year, according to the statistical data of Municipal Clinical Chernivtsi Hospital was at the same level. It was remarkable the determination of mixed combined intestinal infection in 17 (22.9%) patients by confirming in the faeces simultaneously presence of one of the pathogenic salmonella species with pathogenic staphylococci (S.aureus), Pseudomonas aeruginosa, bacteria of Citrobacter, rotaviruses and the fungi of Candida genus.

Whereas, statistical data of morbidity by the end of 2013 evidenced that at the Department of Infectious diseases totally were treated 87 patients with acute gastrointestinal salmonellosis; meanwhile a combined intestinal infection confirmed in 14 cases.

There were 108 hospitalized persons in 2014 year suffered from gastrointestinal salmonellosis, mainly caused by Salmonella enteritidis - in 92 cases (85,2%), or by Salmonella typhimurium - 8, and by other salmonellas of rare species - in 8 cases too. Mixed infections occurred in 11 (10,2%) patients.

Within 2015 there were only 37 admitted patients, among them S. enteritidis was isolated in 33 (89,2%) cases, S. typhimurium - in 3 (8,1%) cases and in one patient bacteriologist had obtained a very rare strain of S. essen . Mixed intestinal infection was observed

in 9 (24,3%) patients.

Having analyzed the intensivity of epidemic process, we may concluded, that gastrointestinal salmonellosis in Bukovyna had mainly sporadic morbidity. Meanwhile six family outbreaks with 13 cases of hospitalization figured out too. Here we are described a few outbreaks stories in particular. In 2013 an outbreak of food-borne gastrointestinal salmonellosis reported in 9 people occurred soon afterwards birthday party. Whereas epidemiological history questioning had revealed that all patients had used a variety of meals, including liver cake (with homemade mayonnaise). Resulted, four patients had exacerbations of chronic gastroduodenitis, chronic pancreatitis, and chronic cholecystitis. Perhaps the fact of consumption of a variety of meals, comorbid gastrointestinal pathology, certain violations of food processing technology and improper storage of ready-to-eat food played a significant role in the development of combined acute intestinal infection.

Analysis of haematologic integrative indexes had evidenced an increase of leukocyte index of intoxication in 2-4,5 times in compare with healthy individuals, index of leukocyte shift in 1,9-2,6 times, hematological index of toxicity in 4-6,5times, and reduce of lymphocytic index in 1,2-2,0 times ($p < 0,05$).

Conclusions

1. During the period 2011-2015 at the department of infectious diseases of Municipal medical institution "Regional Clinical Hospital" of Chernivtsi were treated 374 patients with gastrointestinal salmonellosis caused by S. enteritidis (325 cases), S. typhimurium (37 patients) and other rare salmonellas (12 cases). Typical clinical course in the most patients had noticed and severe gastrointestinal salmonellosis with acute renal failure and hypovolemic shock occurred rarely (in five persons per period), and was associated with late appeal for medical help.

2.According to the analysis of clinical and microbiological investigations for the mentioned period, a combined intestinal pathology involving various agents of bacterial, viral and fungal origin had confirmed in 55 patients, representing 14,7% among all the rest of monoinfection caused by NTS verified in 85,3% of cases.

3.Within acute period of illness processes of endogenous intoxication increased in all admitted patients ($p<0,05$); existing clinical markers and elevation of integrative indicators of intoxication like leukocytic level of intoxication had lifted up in 2-4,5 times, index of leukocyte shift - in 1,9-2,6 times, hematological index of toxicity in 4-6,5 times; and lymphocytic index reduced in 1,2-2,0 times ($p<0,05$).

4. It had not been determined a dependance of the mentioned abnormalities of integrative indices of endogenous intoxication from obtained clinical species of Salmonella; however, combined acute intestinal infections (mixed pathology) had caused the fact, that the level of intoxication syndrome were significantly elevated ($p <0,05-0,001$) comparing with Salmonella monoinfection.

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РЕТРОСПЕКТИВНИЙ АНАЛІЗ ГАСТРОІНТЕСТИНАЛЬНОГО САЛЬМОНЕЛЬОЗУ НА БУКОВИНІ ЗА ПЕРІОД З 2011 ПО 2015 РР.

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Резюме. У статті розглянуто сучасні клініко-патогенетичні, епідеміологічні та мікробіологічні аспекти гастроінтестинального сальмонельозу на Буковині, викликаного S. enteritidis, S. typhimurium, S. newport, S. essen, S. london та інших сальмонел рідкісних груп за останні п'ять років. Висвітлено мікробний спектр поєднаної кишкової інфекції в складі сальмонельозу: найчастіше мікст інфекція включала представників роду Staphylococcus, Proteus, Pseudomonas, Candida, Shigella, Citrobacter, Rotavirus. Детерміновані інтегративні показники ендогенної інтоксикації дозволили підтвердити їх суттєве зростання в гострому періоді недуги у всіх випадках, особливо у випадках гострої мікст кишкової інфекції ($p<0,05$).

Ключові слова: гастроінтестинальний сальмонельоз, Salmonella, Чернівецька область, ретроспективний аналіз, інтегративні показники інтоксикації, спалах, спорадична захворюваність, ускладнення.

РЕТРОСПЕКТИВНЫЙ АНАЛИЗ ГАСТРОИНТЕСТИНАЛЬНОГО САЛЬМОНЕЛЛЕЗА НА БУКОВИНЕ ЗА ПЕРИОД С 2011 ПО 2015 ГГ.

А.С. Сидорчук, Н.А. Богачик, Я.В. Венгловская, М. М. Грицюк

Резюме. В статье рассмотрены современные клинико-патогенетические, эпидемиологические и микробиологические аспекты гастроинтестинального сальмонеллеза на Буковине, вызванного S. enteritidis, S. typhimurium, S. newport, S. essen, S. london и других сальмонелл редких групп за последние пять лет. Освещены микробный спектр сочетанной кишечной инфекции в составе сальмонеллеза: чаще микст инфекция включала представителей рода Staphylococcus, Proteus, Pseudomonas, Candida, Shigella, Citrobacter, Rotavirus. Детерминированы интегративные показатели эндогенной интоксикации позволили подтвердить их существенное увеличение в остром периоде болезни во всех случаях, особенно в случаях острой микст кишечной инфекции ($p < 0,05$).

Ключевые слова: гастроинтестинальный сальмонеллез, Salmonella, Черновицкая область, ретроспективный анализ, интегративные показатели интоксикации, вспышка, спорадическая заболеваемость, осложнения.

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