Received: 25 February 2021 / Accepted: 15 May 2021 / Published online: 30 June 2021

DOI 10.34689/SH.2021.23.3.014

UDC 614.446:616.99

MICROBIOLOGICAL MONITORING IN THE SYSTEM OF EPIDEMIOLOGICAL SURVEILLANCE OF SALMONELLESIS IN CHILDREN'S POPULATION OF THE ALMATY CITY

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Abstract

The aim of study is to assess the dynamics of the isolation of Salmonella strains over an 11-year period.

Materials and methods. A retrospective study was carried out by analyzing the annual statistical reporting forms of the bacteriological laboratory of the "infectious diseases" Almaty City Clinical Hospital No. 1 for the period 2009-2019, where the frequency of the verified Salmonella strain was studied in hospitalized children with intestinal infections, with the prioritization of their serotypes.

Results. Analysis of the effectiveness of bacteriological isolation of clinical isolates of Salmonella from feces of children revealed an ambiguous "figure". Salmonellosis infection caused by the corresponding serotype of the pathogen, with the analysis of the epidemic process, made it possible to reveal long-term fluctuations in the level of involvement in the disease: rises were recorded with an interval of about 3-4 years. In particular, an increase of 1.4 times was found from 1.25% (2009) to 1.74% (2010), the next rise was noted to 1.84% (2012), then to 1.47% (2015) with further decrease within 0.54% (during the period from 2016-2019).

Conclusions. Thus, of the 11 years we studied (2009-2019), in the period 2015-2019, there was a change in the total bacteriological isolation of Salmonella among the examined patients with the registration of percentages in descending order (from 1.47% to 0.54%). Microbiological monitoring of the etiological structure of salmonella infection pathogens showed the dominance of Salmonella rare groups (7/11 years), amounting to 63.6%, the share of isolated S. Enteritidis - 18.2%, and 9.1% S. Virchow and S. typhimurium;

Keywords: bacteriological method, salmonella, Acute intestinal infections, microbiological monitoring, epidemiological surveillance.

Резюме

МИКРОБИОЛОГИЧЕСКИЙ МОНИТОРИНГ В СИСТЕМЕ ЭПИДЕМИОЛОГИЧЕСКОГО НАДЗОРА ЗА САЛЬМОНЕЛЛЕЗАМИ В ДЕТСКОЙ ПОПУЛЯЦИИ ГОРОДА АЛМАТЫ

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Целью исследования была оценка динамики выделения штаммов сальмонелл за 11-летний период.

Материалы и методы. Было проведено ретроспективное исследование путем анализа годовых статистических отчетных форм бактериологической лаборатории «городской инфекционной больницы» ГККБ №1 г.Алматы за период 2009-2019гг, где у госпитализированных детей с кишечными инфекциями изучалось частота верифицированных штамм сальмонелл с определением приоритетности их серотипов.

Результаты. Анализ эффективности бактериологического выделения клинических изолятов сальмонелл из испражнений детей г.Алматы, госпитализированных в стационар позволил выявить за 11 летний период неоднозначную «картину».

Сальмонеллезная инфекция, обусловленная соответствующим серотипом возбудителя, с анализом эпидемического процесса позволила выявить многолетние колебания уровня причастности к заболеванию: подъемы регистрировались с интервалом примерно 3-4 года. В частности, обнаружено увеличение в 1,4 раза с 1,25% (2009) до 1,74%(2010), следующий подъем отмечен к 1,84% (2012), далее к 1,47% (2015) с дальнейшим снижением в течении 0,54% (в течении периода с 2016-2019гг).

Выводы. Таким образом, из изучаемых нами 11 лет (2009-2019гг), в период 2015 – 2019 годах отмечалось изменение суммарной бактериологической изоляции сальмонелл среди обследованных заболевших с регистрацией процентных показателей по нисходящей (от 1,47% до 0,54%). Настоящая тенденция может считаться достаточно позитивной, свидетельствующей о снижении интенсивности циркуляции сальмонелл в детской популяции г.Алматы.

Микробиологический мониторинг этиологической структуры возбудителей сальмонеллезной инфекции показал доминирование Salmonella редких групп (7/11лет), составив - 63,6%, доля изолированных S. Enteritidis - 18,2%, и по 9,1% S. Virchow и S. typhimurium;

Ключевые слова: *бактериологический метод, сальмонелла, ОКИ, микробиологический мониторинг, эпидемиологический надзор.*

Түйіндеме

АЛМАТЫ ҚАЛАСЫНЫҢ БАЛАЛАР ПОПУЛЯЦИЯСЫНДАҒЫ САЛЬМОНЕЛЛЕЗДЕРДІ ЭПИДЕМИОЛОГИЯЛЫҚ ҚАДАҒАЛАУ ЖҮЙЕСІНДЕГІ МИКРОБИОЛОГИЯЛЫҚ МОНИТОРИНГ

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Зерттеудің мақсаты 11-жылдағы сальмонелла штаммдарының бөлінуінің динамикасын бағалау.

Материалдар мен әдістер. 2009-2019 жж.кезеңінде Алматы қ. №1 ҚКБ "Қалалық жұқпалы аурулар ауруханасы" бактериологиялық зертханасының жылдық статистикалық есеп беру нысандарын талдау жолымен ретроспективті зерттеу жүргізілді, онда емдеуге жатқызылған ішек инфекциялары бар балаларда олардың серотиптерінің басымдылығын айқындай отырып, верификацияланған сальмонеллалар штаммдарының жиілігі зерттелді.

Нәтижелері. Алматы қаласындағы стационарға жатқызылған балалардың нәжісінен сальмонеллалардың клиникалық изоляттарының бактериологиялық бөлінуінің тиімділігін талдау 11 жылдық кезеңде бір мәнді емес "көріністі" анықтауға мүмкіндік берді.

Патогеннің тиісті серотипіне байланысты сальмонеллез инфекциясы эпидемиялық процесті талдай отырып, ауруға қатысу деңгейінің көпжылдық ауытқуын анықтауға мүмкіндік берді: көтерілістер шамамен 3-4 жыл аралықпен тіркелді. Атап айтқанда, 1,25%-дан (2009) 1,74% - ға(2010) дейін 1,4 есеге ұлғаю анықталды, келесі көтерілу 1,84% - ға (2012), одан әрі 1,47% - ға (2015) 0,54% - ға одан әрі төмендеумен (2016-2019 жж. кезең ішінде) байқалды.

Тұжырымдар. Осылайша, біз зерттеп жүрген 11 жылдан (2009-2019жж) 2015 – 2019 жылдар кезеңінде төмендейтін (1,47% - дан 0,54% - ға дейін) пайыздық көрсеткіштерді тіркей отырып, тексерілген науқастар арасында сальмонеллалардың жиынтық бактериологиялық оқшауланuының өзгеруі байқалды. Осы үрдіс Алматы қаласының балалар популяциясындағы сальмонеллалар айналымы қарқындылығының төмендегенін айғақтайтын жеткілікті түрде оң деп санауға болады.

Сальмонеллез инфекциясы қоздырғыштарының этиологиялық құрылымының микробиологиялық мониторингі Salmonella сирек топтарының (7/11жас) үстемдігін көрсетті, - 63,6%, оқшауланған S. Enteritidis үлесі - 18,2% және 9,1% S. Virchow және S. typhimurium құрады;

Түйінді сөздер: *бактериологиялық әдіс, сальмонелла, жіті ішек инфекциясы, микробиологиялық мониторинг, эпидемиологиялық қадағалау.*

Bibliographic citation:

Baimuratova M., Abdul B.A., Ryskulova A., Tugulbayeva A., Jumatova U., Abdusallamova Z. Microbiological monitoring in the system of epidemiological surveillance of salmonellosis in children's population of the Almaty city // *Nauka i Zdravookhranenie* [Science & Healthcare]. 2021, (Vol.23) 3, pp. 121-130. *doi 10.34689/SH.2021.23.3.014*

Баймуратова М.А., Абдул Б.А., Рыскулова А.Р., Тугулбаева А.С., Джуматова У.К., Абдусаламова З.С. Микробиологический мониторинг в системе эпидемиологического надзора за сальмонеллезами в детской популяции г. Алматы // Наука и Здравоохранение. 2021. 3(Т.23). С. 121-130. *doi 10.34689/SH.2021.23.3.014*

Баймуратова М.А., Абдул Б.А., Рыскулова А.Р., Тугулбаева А.С., Джуматова У.К., Абдусаламова З.С. Алматы қаласының балалар популяциясындағы сальмонеллездерді эпидемиологиялық қадағалау жүйесіндегі микробиологиялық мониторинг // Ғылым және Денсаулық сақтау. 2021. 3 (Т.23). Б. 121-130. *doi 10.34689/SH.2021.23.3.014*

Introduction

Acute intestinal infections (AII) occupy a leading place among infectious diseases of children in terms of morbidity, second only to respiratory diseases (pneumonia) [15]. Infectious diseases are not random episodes, but natural phenomena in the history of human society that develop and change with it [28]. It is understandable that modern infectious disease specialists tend to be rather pessimistic about the prospect of combating infectious diseases in the next decade both in the world as a whole and in Russia, in particular, [18], after all, quoting the words of Louis Pasteur, who said at the end of his life: "Gentlemen, the microbes have the last word" [21], the priority of monitoring bacterial involvement is evident. Salmonellosis is one of the most common zoonotic diseases in the world. [17, 25], while currently they are among the most common intestinal infections in the world.

In most cases, Acute intestinal infections in children occurs as monoinfection (78%) [15]. Salmonella (5.6%) was the most common bacterial etiological agent of Acute intestinal infections. Salmonellosis was more common in children aged 1-7 years, in most cases with lesions of the large intestine (83.5%), while the topical diagnosis was gastroenterocolitis (46.5%) and enterocolitis (37%), much less often - gastroenteritis (8.3%), enteritis (5.7%), gastritis (2.5%) [15]. In the absence of laboratory confirmation, the diagnosis of Acute intestinal infections is established on the basis of clinical and epidemiological data as an “intestinal infection of unknown etiology " with a mandatory indication (as with laboratory confirmation) of the localization of the pathological process in the gastrointestinal tract - lesion topics (gastritis, enteritis, gastroenteritis, colitis, etc.) [16], and knowledge about the nosology of Acute intestinal infections is necessary for a laboratory specialist to issue an adequate conclusion.

Numerous pathogens of acute intestinal infections, salmonella is a great danger due to the fact that they more often than other pathogens cause complications and in some cases are able to form a long-term bacterial carrier. [22], and the results of long-term levels of salmonellosis morbidity and their etiological structure in different age groups [24] remain relevant.

It is no secret that the risk of human infection with Salmonella is directly related to the level of sanitary condition, since it is largely determined by the level of socio-economic well-being of the country's population, as well as the role of the causative agents of salmonellosis in birds in human infection and pathology [20, 11]. An expanded national salmonellosis surveillance system encourages interagency collaboration and communication between microbiologists and epidemiologists in health, veterinary and food-related settings [23].

The epidemiological situation for acute intestinal infections (AII) is complicated by outbreaks, most often caused by salmonella and occurring in catering establishments. [9]. Salmonellosis is one of the most widespread zoonoses in the world [17, 23]. According to the research results [10], and in the structure of salmonellosis, Salmonella enteritidis predominated, and in many regions their own characteristics were noted in terms of the spectrum of salmonellosis pathogens, trends in the change of clinically significant serotypes of salmonellosis pathogens were noted [14, 31].

In the system of epidemiological surveillance, microbiological monitoring, being an integral part of the prevention of salmonellosis in humans caused by specific serovars of the pathogen, remains relevant not only in the population of pathogens and infections associated with the provision of medical care, but also infections common to humans and animals and transmitted with food [11]. One of the features of surveillance in recent years has been the increased role of microbiological monitoring as part of surveillance. At the same time, the colossal variety of serological variants of Salmonella, significant differences in the epidemic potential of some serovars, determined not only the similarity, but also the difference between the salmonellosis surveillance system from other similar systems [23, 10, 27]. At the present stage of the evolution of the epidemic process, there have been changes in the age and etiological structure of salmonellosis in relation to certain types of Salmonella, children, mainly of young age (up to a year). Risk factors for sporadic salmonellosis morbidity in children under one year of age were associated with the nature of their diet, as well as with the presence of domestic animals in the environment of the child, more often cats [26]. Ensuring nutritional safety for newborns and young children is aimed at raising the awareness of parents (mothers), including possible risk factors for the incidence of salmonellosis in children under one year old to medical workers (district pediatricians).

In conclusion, it is obvious that regular monitoring of Salmonella infection in children is desirable due to the persistence of this group of patients for many years.

The aim of the study:

Is to assess the long-term isolation dynamics of clinical strains of Salmonella for the period 2009-2019 at the descriptive stage of the epidemiological diagnosis of Salmonella infection in the pediatric population in order to increase the efficiency and quality of epidemiological diagnosis.

Material and Methods. Our retrospective, descriptive analysis was carried out on the basis of the annual statistical reporting forms of the bacteriological laboratory in hospitalized patients of the City Clinical Infectious Diseases Hospital No. 1 of the Department of Health of Almaty. We studied the frequency of salmonellosis in the structure of verified bacterial intestinal infections (in %) caused by pathogenic pathogens Salmonella in children hospitalized in the department of intestinal infections for the period 2009-2019. The material analyzed was a normal stool sample after defecation, which was collected in a sterile container and delivered for examination no more than 2 hours after picking. All samples were examined by a bacteriological method - sowing feces for pathogenic and (for children under 1 year old) for opportunistic microorganisms using conventional methods: twice upon admission to the hospital, repeated in case of deterioration of the clinical picture of the disease after the course of antibiotic therapy (Приказ № 535 Минздрава СССР от 10.05.031.97г.«Об унификации микробиологических (бактериологических) методов исследования, применяемых в КДЛ ЛПУ» https://online.zakon.kz/Document/?doc_id=35328366#pos=4;-90).

Identification was performed using accepted bacteriological methods according to the commonly accepted method of Menshikov V. V. (Moscow, 2003) and Zubkov M. N. [19, 13, 12] while strictly following the rules of paving laboratory equipment. (Приказ № 535 Минздрава СССР от 10.05.031.97г. «Об унификации микробиологических (бактериологических) методов исследования, применяемых в КДЛ ЛПУ» https://online.zakon.kz/Document/?doc_id=35328366#pos=4;-90). It is not the first year that bacteriologists of the Republic of Kazakhstan, including us, have successfully used the pre-patent developed by the Department College to identify clinical isolates of Salmonella: "Method for Identification of Enterobacteriaceae" (18874). [3] At the same time, of course, the definition of Salmonella acids is used by the regulatory documents of the Republic of Kazakhstan. (Приказ №126 от 27 марта 2018г «Санитарно-эпидемиологические требования к организации и проведению санитарно-противоэпидемических (профилактических) мероприятий по предупреждению заболеваний острыми кишечными инфекциями» https://adilet.zan.kz/rus/docs/V1800016793). According to the inclusion criteria, the structure of clinical microbiology (CM) studies in our work with pediatric stool samples with clinical diagnosis is shown (according to a referral by a clinical physician) - "acute intestinal infections", in some cases With the diagnosis - "Salmonellosis". The exception group was patients with a diagnosis of dysbacteriosis. The effectiveness of our clinical microbiology studies was evaluated using the bacteriological index of "seed rate", determined by the ratio of the number of positive tests to the total number of tests performed, expressed as a percentage: the number of positive tests (number) divided by the total number (Denominator) X 100% = seed rate. The etiological structure was recorded according to the basis of classification: family, genus, species, serovar.

This study is part of the implementation of the master's thesis of Kazakhstan University of Continuing Medicine (for scientific and educational, specialty - Health Organization), together with the initiative of employees (doctors of practical medical care), without financial support from foreign organizations. It has not been confirmed because this study is based on archived data from the analysis results of a bacteriological study of patients. Patient informed consent was not required in this regard. The management of Almaty City Infectious Diseases Hospital No. 1 in the Almaty Health Department is familiar with the progress of the study and does not oppose press coverage.

The arithmetic mean (x) – a value that characterizes a number of individually varying variables by a single numerical value-was the main characteristic of the sample based on quantitative characteristics. [1, 8]

Results.

Our analysis of the incidence of salmonellosis in children in Almaty, hospitalized in the hospital, revealed an ambiguous "picture" over an 11-year period. Comparative assessment of the frequency of Salmonella isolation and the structure of the epidemic process of Salmonella infection in the studied metropolis (region), which is characterized by a high population density among the population of the Republic of Kazakhstan. The data obtained by us testify to the inequality of morbidity among the child age group, as a risk group for the incidence of salmonella infection among the population of Almaty.

We solved the following tasks: assessment of morbidity trends; cyclical (periodicity) incidence; predicting the further development of morbidity; the effectiveness of various (for example, preventive) measures; comparing the dynamics of selection with the dynamics of possible risk factors. Dynamics is the distribution of absolute numbers or frequency indicators (intensity) over time [7]. Assessment of changes in the situation over a 10-year (2009-2019) period of time allows us to assume about the possible reasons for changes in forecasting the development of the situation in the future.

Based on our laboratory test results, a dynamic comparative analysis was carried out. Quantitative analysis indicators, i.e. loads over a 11-year period varied from 45129 (2009) to 78665 (2019), and from 2009-2011 there was some stability, already from 2012. (50032) during the next 6 years until 2017 (51144) there was an increase of at least 1.1 times or more from the beginning of this period with some increase. The next segment of the period under discussion was revealed 1.7 times from 2018 (46,042) to 2019 (78,665). In this regard, we assume that the dynamics under consideration reflects the impact of causal factors, the set and / or strength of influence of which changes over time.

As can be seen in Fig. No. 1, the frequency of long-term dynamics characteristic of Salmonella infection, as one of the serious infectious pathologies, is obvious. Several types of long-term fluctuations in the incidence rate have been recorded in the bacterial involvement of the etiology of Acute intestinal infections caused by salmonella during long-term observation of the epidemic process: incidence increases with an interval of about 3-4 years. In particular, an increase of 1.4 times was recorded from 1.25% (2009) to 1.74% (2010), the next rise was noted to 1.84% (2012), then to 1.47% (2015) with further decrease within 0.54% (during the period from 2016-2019).

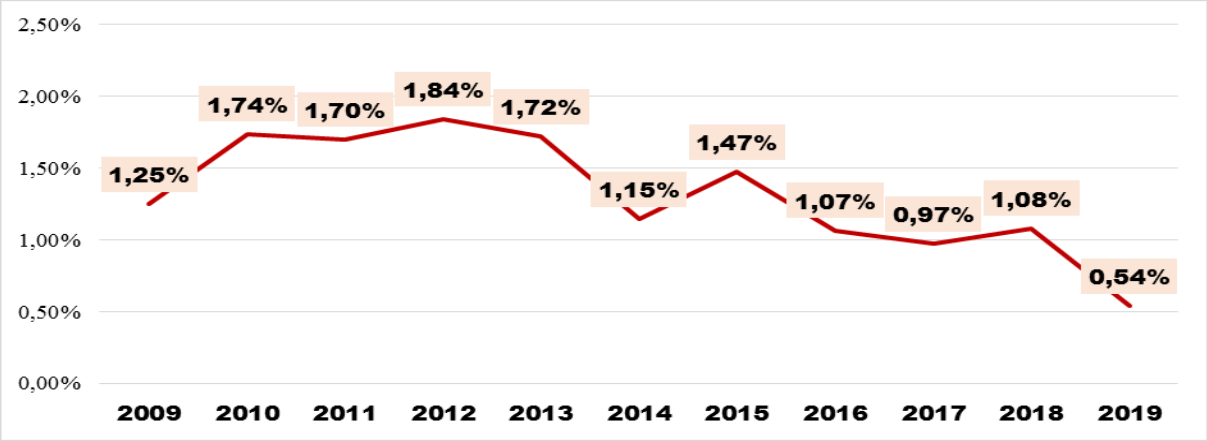

Figure №1. Monitoring for a 10-year period (2009-2019) of the detection of bacteria of the genus Salmonella spp. in the children's population of Almaty.

All of the above indicates the absence of an inter-integral connection between laboratory specialists and clinicians, which dictates the need to increase the level of knowledge about clinical and laboratory diagnostics by practicing physicians in clinics. And so, the incidence of salmonellosis in children established by us using the bacteriological method (based on the cultural method) in Almaty in 2019 was 0.54%, which, compared with the long-term level for the period from 2009-2019, was identical to the arithmetic mean - 0.57%. Analysis of the structure of the incidence of salmonellosis revealed peaks in: 2010, 2012, 2015 and 2018.

As shown in Figure 1 for the 11-year period, the overall dynamics of Salmonella infection in the structure of AEI has a steady downward trend in comparison with 2009 by 2.3 times, and in comparison, with the peak in the long-term dynamics of 2013 by 3.9 times. In the long-term dynamics of Salmonella infection in terms of the etiological structure, the share of the contribution of S. typhimurium decreased from 29.3% by almost 1.73 times, respectively, to 16.94%. Revealed change in the microbial landscape since 2011. in the etiological structure of salmonellosis due to S. Virchow, varying from 1.29% to 38.1%, with a one-year decline and an increase in registration levels in the general structure of Salmonella infection. Meanwhile, a characteristic feature of the studied group was the stable detection of Salmonella rare groups over the entire 11-year period from 24.4% to 44.4%, in fact, of all salmonellosis in every 2-3 cases of diseases as an etiopathogen.

Thus, of the 11 years we studied (2009-2019), in the period 2015-2019, there was a change in the total bacteriologically isolated involvement among the examined patients with the registration of percentages in descending order (from 1.47% to 0.54%). The tendency we have identified can be considered quite positive, indicating a decrease in the intensity of circulation of Salmonella in the pediatric population of Almaty.

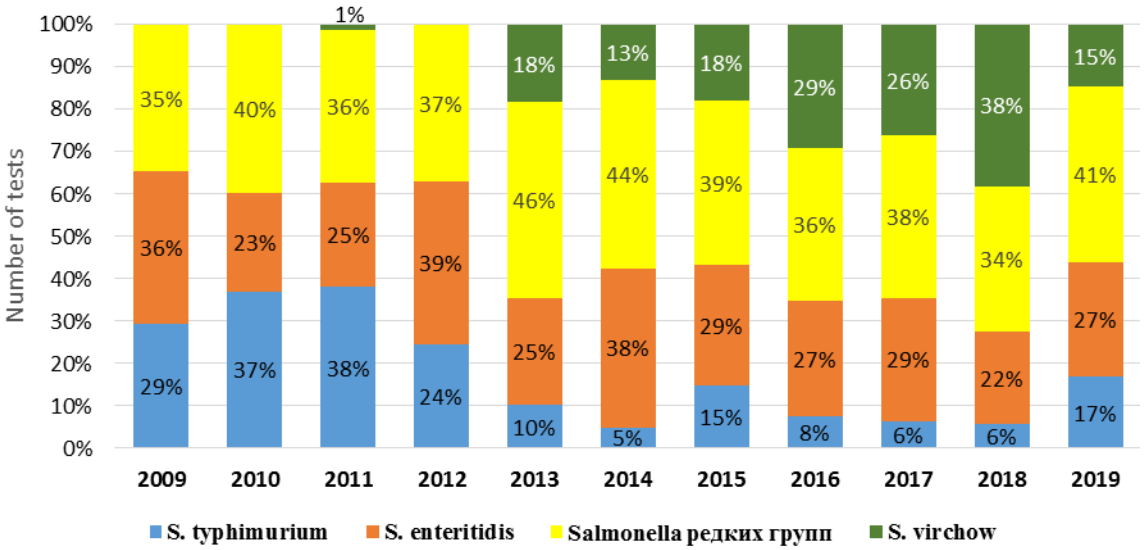

Figure №2. Species ranking of bacteria of the genus Salmonella for the period 2009 – 2019.

As can be seen in Figure 2, for the period under study from 2009-2019 in the category of children from 0-14 years old, most often in a dynamic study, among 4 Salmonella species, in the 1st place, 63.6% of Salmonella were found rare groups. They are relatively stable, registered for 7 years: 2010-40%, 2013-46%, 2014-44%, 2015- 39%, 2016-36%, 2017-38% and 2019-41%. Monitoring of the frequency of isolation of clinical isolates of Salmonella coprological strains of rare groups, was presented in the form of a wavy curve, in the first four years: in 2009 - (n-195), and in 2010,

2011, 2012, that is, the percentage of cultural isolation of copstrains was: 40% - (n-312), 36% - (n-282), 37% - (n-342), respectively. At the same time, for a 5-year period: 2013, 2014, 2015, 2016, 2017. the allocation ranged from 36% in 2016 (n-206) to 46% in 2013 (n-446), which turned out to be the largest number over the 11-year observation period. A feature of the other 3 years was the isolation of Salmonella rare groups, with the exception of 2018, only two years were of interest: 2017 -38% (n-191) and 2019-41% (n-176).

Coprological strains in the structure of salmonellosis in children of group D, S. enteritidis, for the studied period 2009-2019. in our work ranked first only in 18.1%, registering only in 2009 - 36% (n-203) and in 2012 - 39% (n-355).

Clinical coproisolates of S. typhimurium, from the same group D, only in 2011 accounted for 38% (n-299). With regard to S. Virchow, over the analyzed eleven-year period, they were leaders only in 2019 -41% (n-176). It is important to note that the isolation of S. Virchow, which amounted to 63.6%, made it possible to think about possible changes in the etiological regional structure of salmonellosis due to the expansion of group B salmonella. took place already in 2013, 2014, 2015, amounting to: 18%, 13% 18%, respectively. True, by 2016 and 2017, there was an increase to 29% and 26%, respectively, and then an episode of an increase in S. Virchow excretion was detected, recorded in 2018 (38%), which sharply decreased 2.5 times by 2019 to 15%.

Previously, we studied the salmonella release monitoring details for 2016 and 2017, when a decrease in their participation was found from 1.07 to 0.97 found. The detection curve of pathogens of acute intestinal infections for the period 2017-2017 includes 1.47% of Salmonella bacteria. [6, 2, 4, 5], which necessitated the need for continued monitoring to optimize the diagnosis in order for epidemiologists to draw attention to unconditional flora, including Salmonella. Summarizing the results obtained by us from monitoring the microbiological isolation of clinical Salmonella isolates from stool samples of children who were in hospital, one gets the impression of unidirectional changes based on growth in 2010 (1.74%) and 2012 (1.84%), albeit with a further decrease to 0.54% of Salmonella strain isolation and relative stabilization, which is 2.3 lower than in 2009 (1.25%). With regard to changes in species diversity over the 11-year period under study with periodic insignificant increases in excretion, which we interpret as random and allow us to think about the sporadic occurrence of Salmonella infection, excluding cyclicity, that is, repeating from year to year with an increase in incidence. Briko N.I. considered a similar long-term dynamic in Acute intestinal infections, more obvious in places that are unsatisfactory in sanitary and hygienic terms. with coauthors (2013) [7].

After analyzing our results of bacteriological studies with the identified dominant Salmonella of rare groups and the species diversity of Salmonella, we consider it an important and objective method for assessing the degree of infection spread that can create a basis not only for planning, analyzing and conducting preventive and anti-epidemic measures, at the same time helping to identify changes in the nature of development epidemiological process of salmonellosis to help the epidemiologist and clinicians.

Discussion

Previously, when we studied Salmonella excretion monitoring, only a 2-year period (2016 and 2017) was analyzed in the context of another master thesis based on Almaty Clinical Hospital No. 1. In the structure of acute intestinal infections, a reduction in Salmonella involvement was observed from 1.07 to 0.97, due to the entropy of Yersinia and Escherichia coli. Frequency curve for the detection of pathogens among acute intestinal infections including Salmonella bacteria. It was 1.47%.

An analysis of 11 years of monitoring, a broad period of time, allowed us to look at the issue differently. An increase in the incidence of salmonellosis in the pediatric population was recorded at approximately 3-4-year intervals (2010, 2012, 2015 and 2015), ie for the period 2009-2015, an increase of 1.25-1.84% was observed. In 2016, changes in the situation with a positive shift towards decline, occurred until 2019. In this regard, Russian epidemiologists have reported that the increase over a period of 3-5 years is usually associated with internal features. Occurs: in the presence of the source of infection, others are rapidly involved in the pathogen circulation (obvious and asymptomatic forms of infection), leading to the formation of an immune layer among the population and, consequently, increasing the immunity of the population. [**7**]. According to Briko N. I. in collaboration with the authors (2013), it has been found that the smaller the interval between increases (about 3 years), the larger the population. The largest highways are characterized by the shortest comfort distances [7], which can be used for our study in Megapolis. As practice shows, common reasons may be mentioned that directly affect the reliability of bacteriological research (conclusion). Regarding the main reasons for not identifying the pathogen, we accept the following: Short stay in the hospital (most of these cases are the patient's own violation, ie leaving before the examination), Previous (independent of the patient) Antibiotic treatment Clinical misdiagnosis Possible (unacceptable distinction between acute intestinal infections and dysbiotic disorders, eg diarrhea syndrome). It is not ruled out as a reason for canceling the diagnosis (diagnosis of hypo or overdose) that has not yet been registered in the recipient compartment, or even when the patient is in an infectious unit.

The positive result of our work can be determined by bacteriological method, the incidence of salmonellosis in children (based on the cultural method) in Almaty in 2019, which compared to the long-term level (for the period from 2009-2019) of an average value Identical - 0.57%. The overall dynamics of Salmonella infection in the structure of acute intestinal infections over the 11-year period has been steadily declining, initially by 2.3-fold, and by 3.9-fold compared to its peak in 2013.

The instructive value of monitoring bacteriological studies is clear, as the results are aimed at strengthening anti-epidemic measures and management decisions by epidemiologists based on pathogens of unconditional pathogens of Salmonella spp. The structure of the long-term dynamics causes of Salmonella infection was the leader of S. tyhymurium, however, with a 29.3% decrease

in contribution of approximately 1.7-fold (16.9). According to our 2011 monitoring data, a change in species preference in the occurrence of S. salmonellosis is evident. Virtue (from 1.29 to 1.38%), with a long period of alternation and an increase in the level of registration in the overall structure of Salmonella infection. In fact, the isolation of S. virchow, which amounted to 63.6%, allowed us to think about possible changes in the regional structure of salmonellosis, due to the spread of group B by Salmonella. In addition, the nature of S. Virchow-like wave detection changed before 2015, and established itself as a "leader" in 2016 and 2017, rising to 29% and 26%, respectively, and then again, a part of The increase in S. Virchow allocation in 2018 (38%), although 2.5 times by 2019, has sharply decreased to 15%. Published data by Russian scientists is somewhat different, as species preferences in Russia among Salmonella copostams, according to Shubin FN et al. (2016), were shown to be in the structure of the cause of Salmonella infection by Salmonella enterica serovar. Enteritidis) [30]. We hypothesize that the data obtained can be interpreted as the cause of intestinal infections caused by food in many countries of the world [29], but in our study, this type of research has not been done. The prevalence of Salmonella in environmental objects does not eliminate the possibility of increased disease in violation of the modes of processing and storage of food and cooking products, as well as non-compliance with personal hygiene rules. [17].

For the entire 11-year period, a characteristic feature was created in the pediatric study group, which was expressed with a stable stable diagnosis of rare Salmonella expressed from 24.4 to 44.4; As an etiopathogenic agent.

Summarizing the results and considering the practical observations, it can be noted that common factors that directly affect the reliability of bacteriological study, including S. Virchow (ie, a sudden decrease in isolation by bacteriological method)), may be Do not consider. Discussion of the main reasons for not diagnosing pathogens is quite realistic, including: lack of doctors, short stay in hospital (for example, most cases are violated by the patient, which is pre-examination care), treatment Previous antibacterial clinical diagnosis may be wrong. It is no exception that the reason is the cancellation of the diagnosis (hypo - or overdiagnosis) that is registered even in the emergency department or even when the patient is in the infectious departmentIn summary of all the above, there is a lack of integral communication between laboratory specialists and physicians, which necessitates monitoring of Salmonella infection on the one hand, to increase the level of knowledge about clinical and laboratory diagnosis by practitioners. In clinics, the trend we have identified can be considered quite positive, which indicates a decrease in the intensity of Salmonella circulation in the pediatric population in Almaty.

Conclusions:

1. According to the results of the microbiological monitoring of the etiological structure of the causative agents of Salmonella infection isolated from sick children, the dominance of Salmonella rare groups (7/11 years) was established, amounting to 63.6%, the proportion of isolated S. Enteritidis - 18.2%, and 9, 1% S. Virchow and S. tyhymurium;
2. A steady tendency has been established to reduce the dynamics of the involvement of salmonellosis as an etiopathogen in the structure of Acute intestinal infections.
3. Revealed a change in the microbial landscape since 2011 with the appearance in the etiological structure of salmonellosis caused by S. Virchow from 1.29% to almost half of cases (44.4%) of all salmonellosis.
4. A stable tendency has been established over an 11-year period of a decrease in the involvement of S. typhimurium from 29.3% to 16.94% as an etiopathogen of salmonellosis.
5. It was revealed that in the long-term dynamics, the stable leading position of Salmonella rare groups remained, that is, almost every 2-3 cases of Acute intestinal infections were of Salmonella etiology.

Contribution of the authors:

Mairash Baimuratova: scientific Director, the developer of the project, a synthesis of the material;

Abdul Basit Ateel: statistical data processing with the creation of diagrams, summing up the results, conclusions, English translation;

Aliya Tugulbayeva: quantitative calculation, processing of primary material, correction of the primary material with the head (Mairash Baimuratova);

Ulbossyn Jumatova: collection and processing of fresh literary sources;

Alma-Gul Ryskulova: analysis and selection of special retrospective sources;

Zahida Abdusallamova: provision of primary material.

The authors declare that there is no conflict of interest.

The authors claim a lack of funding.

This article and parts of the materials of the article were not previously published and are not under consideration in other publishers.

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