Epidemic Process of Salmonellosis in Tashkent

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Abstract

In the latest decade, epidemiological features of salmonellosis morbidity have changed, in particular, the fraction of humans and animals, caused by S. enteritidis, has increased. It was caused by social changes in the population life: widespread development of private property, increased population migration, rapid development of the public catering system, etc. The features of salmonellosis epidemic process were analysed in Tashkent. S. enteritidis has also dominated in the causal structure of salmonellosis, registered in food products and other environmental objects over the past twenty years in Tashkent.

In the long-term dynamics of salmonellosis morbidity in Tashkent, there is a downward trend: in 1991 - 92.85 cases per 100 thousand people, in 2017 - 13.2, that is, over a 26-year period, the morbidity decreased by 6.7 times.

Keywords: *Salmonellosis, epidemiology, prevention.*

Introduction

Salmonellosis, called the “disease of civilization” is so widespread that at present it cannot be eliminated in any country, the morbidity rate can only be decreased[7]. Salmonellosis occupies a special place among acute intestinal infections. Unlike dysentery, typhoid fever, colibacillosis and cholera, they are caused by microorganisms being pathogenic for animals and humans in natural conditions[9]. There are two salmonella reservoirs in nature - animals and humans. There are two salmonella reservoirs in nature - animals and humans[10]. The expansion of international trade in animals and animal products, feed, a high concentration of livestock in a limited area, environmental changes, leading to the emergence of new Salmonella properties[3], introduction of modern mass technologies for slaughter and processing of animals, expansion of the catering network, are the main factors, contributing to salmonellosis spread[5].

In the latest decade, epidemiological characteristics of salmonella morbidity in Uzbekistan have changed, in particular, the fraction of people, suffering from S. enteritidis, the incidence of Salmonella infection in farm animals, birds, and the environment has increased[2]. It was caused by social changes in the population life: widespread development of private property, increased population migration, rapid development of the public catering system, etc[1].

In the 90-ies, in Uzbekistan, as a result of political and economic reforms, significant changes took place in the system of food production and sale, including poultry products. Most catering and trade enterprises became privately owned. At the same time, a sanitary-epidemiological service reform was introduced, accompanied by a sharp limitation of the frequency of inspections of controlled objects and the volume of microbiological studies of environmental samples. These social changes had a serious impact on salmonellosis epidemic and epizootic processes[6].

In this situation, there is a need for a theoretical justification of measures to control and prevent salmonella infection, considering current features of not only epidemiology, but also epizootology of salmonellosis enteritis. Meanwhile, the epizootic process of salmonellosis enteritis among farm animals and birds and its effect on intensity, dynamics and structure of the population morbidity in Uzbekistan have not been studied. Currently, the prevalence of bacterial diseases in animal husbandry worldwide is 16.2%, of them 10.9% are mixed bacterial diseases. In the development and increase of livestock yield, being the agricultural

main sector, it is important to increase livestock on state farms, farms and private farms, increase their yield, get healthy livestock, provide good care and protect it from various diseases[10]. The increasing epidemiological role of livestock and poultry, industrial poultry products, relationship of epizootic and epidemic processes call for restructuring of the existing system of salmonellosis epidemiological surveillance according to epizootological and epidemiological surveillance principles[7].

The purpose of this study was to research the prevalence of salmonellosis morbidity in Tashkent and determine epidemic process features of this infection.

Materials and Method

The study was based on official data of the State Sanitary and Epidemiological Surveillance Department on salmonellosis causal structure and retrospective epidemiological analysis results of salmonellosis morbidity in 1992-2017 in Tashkent. The epidemiological survey results of 114 salmonellosis foci, registered in Tashkent, were studied. The method of epidemiological survey of foci and epidemiological analysis were applied: descriptive research method (observation technique, study method of spatial spread of diseases, method for temporal distribution cases in time, method for cases distribution among different population groups, statistical method), analytical research method (formal logic, statistical, cohort and retrospective study method).

Results and Discussion

The spatial distribution of salmonellosis diseases was contrasting, with Tashkent being extremely unfavourable in terms of salmonellosis, high morbidity was also registered in Tashkent, Ferghana and Andijan regions (Fig. 1).

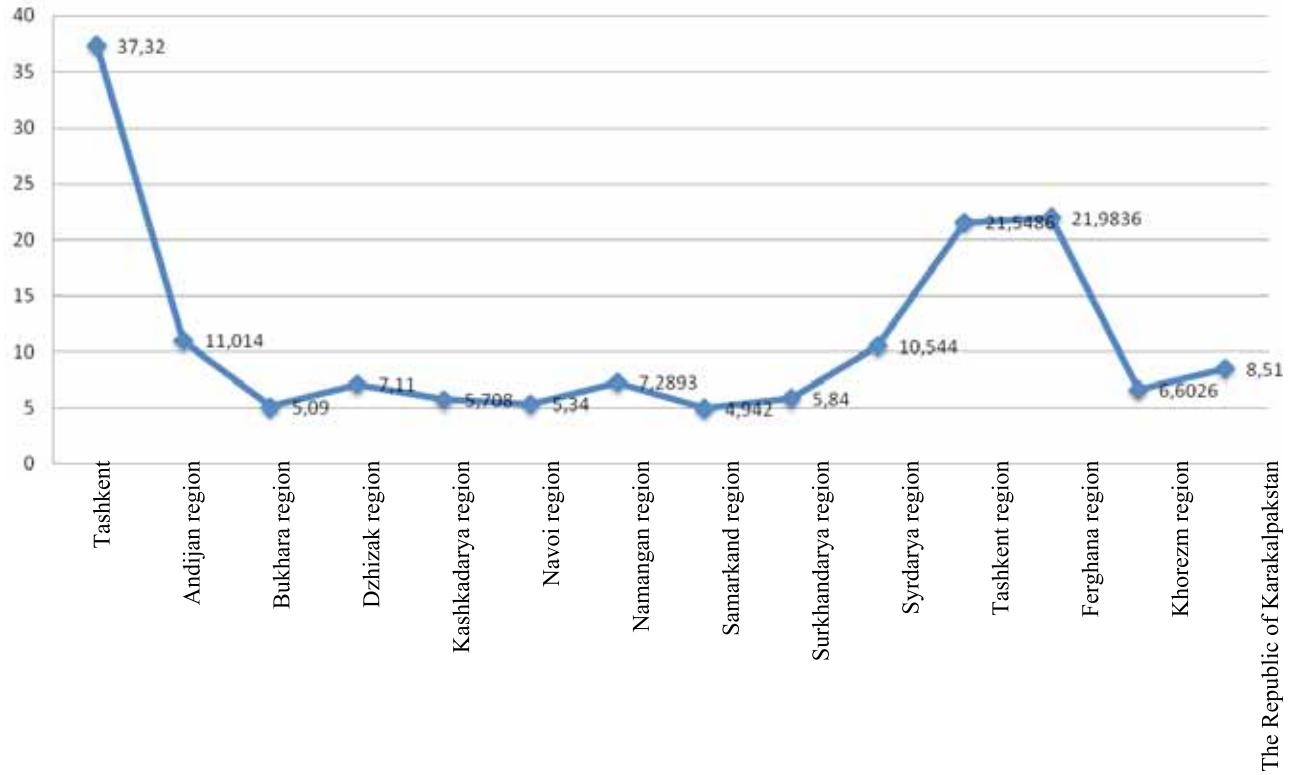

Fig. 1. Spatial distribution of salmonellosis morbidity in the Republic of Uzbekistan over 26 years (1991-2017)

One of the most important epidemiological determinants, defining the nature of salmonellosis epidemic process is attributed to serovar, prevailing in the causal profile. S. enteritidis has dominated in the causal structure of salmonellosis, registered in food products and other environmental objects over the past twenty years in Tashkent. The proportion of diseases caused by S. enteritidis in the general structure of salmonellosis

was s follows (1992 - 17.1*%,* 2008 - 35*%).* Another serovar, S. infantis, rarely registered in humans until the 1990s, subsequently occupied sufficient proportion in the causal structure of salmonellosis (1992 -6 6% 2008 r.-14.6%).

The causal structure ofsalmonellosis in humans and the serotypic profile of salmonella, registered in food products and environmental objects, often were the same. Common serovars, dominating in humans and food products were as follows: S, typhimurium, S. enteritidis, and S. infantis. Moreover, these salmonella were polyresistant to antibiotics.

The study results of animal salmonellosis showed significant infection of birds, pigs and cattle to a lesser extent. Salmonella, registered in animals, were distributed in 13 serological variants. Adapted Salmonella serovars were mostly registered. In the long-term dynamics of salmonellosis morbidity in Tashkent, there is a downward trend: in 1991 - 92.85 cases per 100 thousand people, in 2017 - 13.2, that is, over a 26-year period, the morbidity decreased by 6.7 times (Fig. 2).

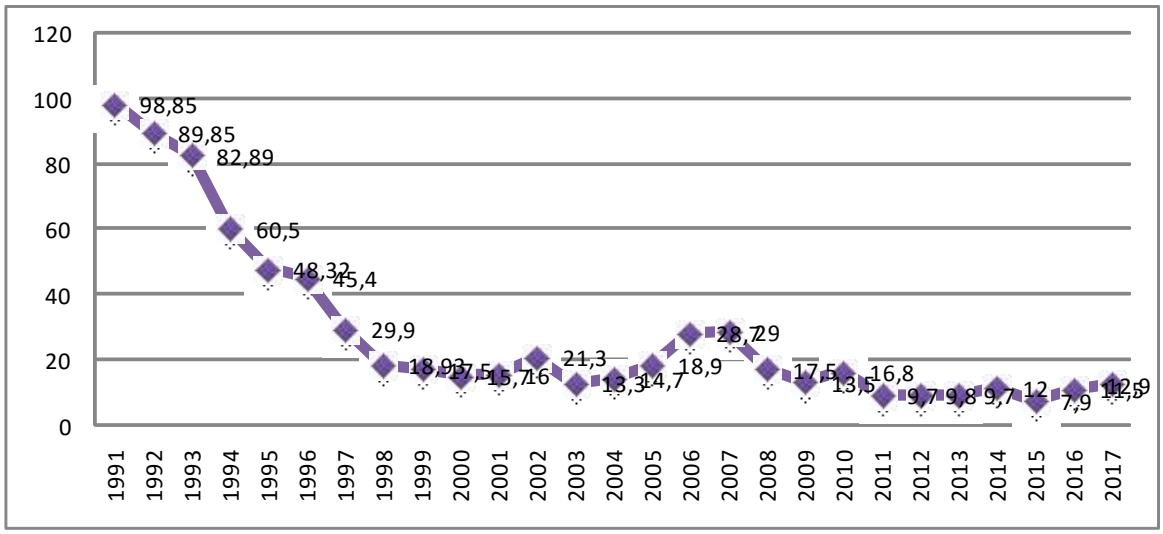

Fig. 2. The dynamics of salmonellosis morbidity in Tashkent during 26 years (1991-2017) in int. indices

The salmonellosis incidence is registered in all age groups. Social factors had the greatest effect on morbidity formation in children under the age of 14. We determined that children under the age of 14 are more likely to suffer from salmonellosis, and a significant number of patients are observed among adolescents of 15 years of age and older. The salmonella mostly enters the human body orally by consumption of meat and dairy products that do not meet hygiene requirements. Considering a great number of private catering facilities are organized, they often sell food, very popular among children and adolescents (fast food, pizza, grilled chicken, etc.), the control over food preparation and storage is not always proper, which is so it may be the cause of salmonellosis. All these factors present mass transmission pathogens in the period of a seasonal increase in the morbidity among older people[4].

The monthly distribution of salmonellosis morbidity was quite regular, with the highest rates in Tashkent recorded during hot months: up to 60% of cases were diagnosed during June-September. Such seasonal distribution is related to activation of nutritional transmission factor (meat, dairy products, vegetables, fruit). The role of open water as an additional factor in the transmission of infection is not excluded, since salmonella of the same serovars are detected in water as in humans. According to Kh.B. Magzumov's data (1975), in the conditions of

Uzbekistan, developed horticulture, vegetable growing, and picking vegetables and fruit in summer also contribute to salmonella infection, the special experimental studies have shown significant salmonella contamination of vegetables and fruit.

The epidemiological survey of the foci showed sporadic morbidity (92%). Multiple foci amounted to 8%. Most of the multiple foci were registered in children's hospitals, child care facilities and apartments. The foci were different by nature: food or household episodes; the causative agent was transmitted among children, especially in hospitals, in households and among adults with food products

Conclusions

1. In recent years, in the causal structure of salmonellosis, a decrease in proportion of S. typhimurium has been observed, S. enteritidis and S. infantis became more significant.
2. A long-term study (26 years) of the dynamics of of salmonellosis morbidity in Tashkent showed a downward trend.
3. In regions of the republic, cases of morbidity are distributed unevenly due to social changes: widespread development of private property, increased population migration, rapid development of the public catering system, etc.
4. The salmonellosis morbidity is registered in all age groups.
5. The morbidity is predominantly sporadic by nature, there are minor multiple foci related to food and domestic transmission.

Ethical Clearance: No ethical approval is needed.

Source of Funding: Self

Conflict of Interest: Nil

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