

# Endemic and Non-Endemic Infections in the Russian Far East

Evgeny V. Vitko and Gennady S. Tomilka

Key words : Infectious diseases, incidence rate, acute enteric infections, influenza, acute respiratory infections, droplet infections, feral herd infections, parasitic diseases

## Abstract

This article sums up the data on some clinical and epidemiological peculiarities and structure of the most widely spread endemic and non endemic diseases of the Russian Far East and the Russian Federation.

## Significance of the problem and the structure of infection pathologies in the Russian Far East.

Infectious diseases continue to rank among the most common human diseases in Russia. Problems of respiratory infections, viral hepatitis, acute enteric infections, and diphtheria are still an issue of the day in this country. New infections caused by herpes virus, Borrelia, Chlamydia and other pathogens have become widespread; HIV-infection poses a serious threat to the nation. Socioeconomic changes of the late 20th century have brought about the stratification of Russian society resulting in the great number of socially unprotected people. Many infectious diseases have acquired a severe clinical course, often ending in lethal outcome.

The following infectious diseases are currently prevalent in the general infection structure in the Russian Federation:

- (i) Influenza and acute respiratory infections;
- (ii) Acute enteric infections;
- (iii) Droplet infections;
- (iv) Hospital-acquired infections;

- (v) Social milieu-specific diseases;
- (vi) Zoogenous and feral herd infections.

Basic severe pediatric diseases are as follows:

- (i) Severe respiratory viral infections and influenza
- (ii) Infection toxicosis;
- (iii) Pneumonias;
- (iv) Intrauterine infections;
- (v) Sepsis;
- (vi) Purulent meningitis;
- (vii) Congenital and acquired carditis;
- (viii) Infection in children with congenital heart disease;
- (ix) Infection in children born to HIV- and syphilis-infected mothers.

In 2008, over 29.9 million cases of infectious and parasitic diseases of 50 nosologic descriptions, including 28.09 million cases of influenza and acute respiratory infections, were registered in Russia.

In January-February 2009, 6,171,684 cases of infectious diseases, including influenza and acute respiratory infections, were registered in the Russian Federation, which is insignificantly (by 3.5%) lower than the figures of the similar period of 2008.

As of the three months of 2009, a reduced rate of incidence of 26 nosologic descriptions is observed as compared with the similar indices of

2008.

The following factors produce the most marked adverse effect on human health in the Russian Far East: low ambient temperatures, high temperature with high humidity, infectious diseases (acute enteric infections, influenza, meningococcal infection, tick- and mosquito-borne encephalitis, diphtheria, hemorrhagic fever with renal syndrome).

#### **Acute enteric infections**

Annually, 556,000-558,000 cases of acute enteric infections of known and unknown etiology are registered in the Russian Federation.

Acute enteric infections and food toxicoinfections of unknown etiology account for 75-78% of the total acute enteric infections.

#### *Salmonellas diseases*

Salmonellas diseases incidence rate in 2008 was stabilized at a level of 31.96 cases per 100,000 people. Annually, up to 30 major outbreaks of food salmonellosis with 500 to 1,500 individuals involved are registered in this country. These outbreaks are caused by violation of cooking process regulations, failure to comply with storage life, inobservance of equipment disinfection procedures at public catering enterprises (Абросимова Л.М. и соавт., 2008; Серёжичева И.М., 2008).

#### *Shigellosis*

Over one third of shigellosis cases fall at the age group of 3-6 year old children attending preschools. With the general reduction in the shigellosis incidence rate observed, 'outbreak' morbidity of food and water type remains high-annual rate of 40-50 outbreaks. Food-related outbreaks account for 73%, water-related - for 18%, and contact-related - for 7% of the total number there of.

#### *Rotavirus infection*

Rotavirus infection morbidity is mainly registered in children up to 14 years of age with children under 2 years of age being responsible for the highest rates (over 700 cases per 100,000 people). In 2007-2008, there were 229 outbreaks of this infection in 42 Russia's administrative entities.

#### *Enterovirus infections*

Since 2006, registration of enterovirus infections has been introduced in Russia. Their morbidity rate made 7.0 cases per 100,000 people. The largest figure per 100,000 people has been registered in Khabarovsk Kray-171.0 cases, which is 24 times as much as Russia's average. Enteroviral serous meningitis accounts for 32% of the enterovirus infection structure (2.2 per 100,000 people) with about 90% of cases falling at children under 17 years of age. Virological study of material from patients and out of the environment, conducted in Khabarovsk Kray, confirmed the role of virus ECHO-6 as the prevalent etiological agent (Резник В.И. и соавт., 2008; Сейбиль В.Б., & Мальшкіна Л.П., 2005).

#### **Droplet infections**

##### *Meningococcal infection*

Meningococcal infection morbidity in the Russian Federation has been stabilized at a level of 2-3 cases per 100,000 people. A distinctive feature of this infection in Russia consists in circulation of serogroup A meningococci, which is uncommon to other countries. Meningococcosis is characterized by considerable clinical polymorphism and proceeds as rhinopharyngitis, meningitis and/or meningococcal sepsis. Nearly 80% of cases fall at children and teenagers with children one to five years old accounting for 50% thereof. Among the adults, the majority of cases fall at young people (15-30 years old). It is meningococcal sepsis that

has most severe clinical course, especially in children with marked symptoms of toxicosis and development of secondary metastatic foci of infection.

#### *Diphtheria*

Significant reduction in diphtheria morbidity is observed in Russia-from 0.25 cases per 100,000 people in 2007 to 0.12 cases per 100,000 people in 2008-due to the well organized antidiphtheritic immunization of all groups of people, children in the first place, within the term prescribed by the National Vaccination Schedule (over 95% of the population are covered with the preventive immunization).

A specific feature of the current clinical course of severe diphtheria consists in combined damage to health with frequent involvement of pharynx, larynx, and nose. Severe cases have a progressive malignant course and hardly yield to medical treatment (Отт В.А. и соавт., 2008).

#### **Pediatric droplet infections**

##### *Measles*

For the last decade, measles morbidity rate in the Russian Federation has been demonstrating a strong downward trend. However, measles cases were still recorded in 2008-from 1.07 to 13.18 cases per 100,000 people depending on the territory. An index of 24-month immunization coverage timeliness made 98.6%. All territories of the Russian Federation have reached the 95% vaccination coverage level recommended (Отт В.А. и соавт., 2008).

#### **Feral herd infections**

As of the recent years, epidemiological situation regarding zoonotic and feral herd infections in the Russian Federation has remained very serious. However, in 2008, their morbidity rate was reduced in practically all nosologic descriptions. Tularemia was decreased by 13.1 times, tick-borne encephalitis - by 22.7%,

brucellosis - by 14.5%, tick-borne borreliosis - by 0.3%, and hydrophobia - by 10 cases.

At the same time, a 45.9% rise in Crimean-Congo hemorrhagic fever morbidity was observed, and in children under 14 years old a 17.7% rise in hemorrhagic fever with renal syndrome, 7.6% rise in tick-borne borreliosis, and 0.2% rise in pseudo tuberculosis were recorded.

Hemorrhagic fevers were registered in 56 administrative entities of the Russian Federation, totaling 7,426 cases and making 5.4 cases per 100,000 people.

#### *Hemorrhagic fever*

Hemorrhagic fever with renal syndrome (HFRS) is an acute viral feral herd infection featuring a high fever, marked general intoxication, hemorrhagic syndrome, and peculiar renal damage manifest as nephro-nephritis. Sixteen rodent species and four entomophage species are natural reservoirs of the virus in the territory of Russia. The disease is seasonal in character-the largest number of HFRS cases is reported from May through October, when rodents increase in number and people frequently go for a walk in the woods, go in for fishing, get engaged in farming, and when rodents migrates to living quarters. Currently, HFRS mortality rate in the Russian Far East makes 6-8%, amounting to as much as 10% in certain years.

Epidemiological situation regarding tick-borne viral encephalitis and other tick-borne and feral herd infections in the Russian Federation remains tense, and disease incidence area is expanded. In 2008, cases of the disease were recorded in 47 administrative entities of Russia.

#### **Parasitic diseases**

Of late years, no improvement of the epidemiological situation has been observed in Russia. Imported cases of malaria are still reported. An increase in the incidence rate of some helminthiasis (opisthorchiasis,

clonorchiasis), that result in disability or lethal outcome, is observed. Cases of nosologies previously undiagnosed in the territory of Russia (anisakiasis, dirofilariases) are detected. Parasitic diseases rank second after flu and acute respiratory diseases in the Russian Federation, still accounting for 4% of the total number of infections.

#### *Trichinosis*

Trichinosis is a naturofocal helminthiasis caused by a porkworm and presenting with acute clinical course, fever, marked allergy, and damage to cross-striated muscles. A causative agent, *Trichinella spiralis*, is a small nematode. A mature female individual is 1.5-4.4 mm long, a male individual does not exceed 2 mm in length. The female lays larvae that, in the host muscles, increase up to 1 mm in length, twist into spirals and get encapsulated by the end of the third-fourth week. One contracts the disease while eating underdone meat of invertebrates, especially wild boars, bears, seals, swine, and dogs. Trichinosis shows up as group outbreaks, often of family character.

#### **Conclusion**

To sum up, we can conclude that the problem of infectious and parasitic diseases stands more and relevant nowadays in spite of all anti epidemic efforts made.

Understanding that epidemics of dangerous infections may cause irreversible damage to the mankind and proceeding from its own successful experience of infection control, the Russian Federation suggests that leaders of G8 states should include the issue of infection control into the agenda of their summit meetings.

A number of important issues have already been addressed and decisions have been made to join efforts in supervision and monitoring of infectious diseases, to intensify scientific research, to support efforts of international

organizations aimed at efficient control of avian flu outbreaks, preparation for eventual flu pandemic, control of HIV/AIDS, tuberculosis, and malaria, to ensure better access to preventive health care and medical treatment, to counteract and prevent from epidemic consequences of natural disasters and technogenic catastrophes.

Solution of these and any other problems should be based on already existing mechanisms, including the Global Outbreak Alert and Response Network (GOARN) operating under the aegis of WHO. International medical and health regulations are a similar important tool of the world community in the field of infectious disease control.

In view of implementation of the above decisions, a concept of financial support to Russian initiatives in the field of infectious disease control has been developed and taken action.

#### **References**

- Абросимова Л.М. и соавт. (2008) Клинико-эпидемиологическая характеристика сальмонеллёза, Дальневосточный журнал инфекционной патологии, №12.
- Серёжичева И.М. (2008) Некоторые вопросы клиники и диагностики сальмонеллеза в Амурской области, Дальневосточный журнал инфекционной патологии, №12.
- Резник В.И. и соавт. (2008) Этиология серозно-вирусного менингита в Хабаровском крае, Дальневосточный журнал инфекционной патологии, №12.
- Сейбиль В.Б., & Малышкина Л.П. (2005) Энтеновирусы в XX и XXI веках, Журнал микробиологии, эпидемиологии и иммунологии, №4.
- Отт В.А. и соавт. (2008) Итоги и перспективы вакцинопрофилактики в Хабаровском крае, Дальневосточный журнал инфекционной патологии, №12.