Epidemiological and clinical features of HFRS in military men of different military units of the Orenburg region

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Abstract. The epidemic process of hemorrhagic fever with renal syndrome (HFRS) was studied in different districts of the Orenburg region – the territories of military units dislocation. Significant features of the infection risk, clinical and epidemiological characteristics of HFRS process were revealed among the military personnel.

The key words: hemorrhagic fever with renal syndrome, epidemic process, clinical course.

Within the last decade the Orenburg region moved to the fourth place according to the incidence of HFRS (24,1 °/ooo) in Volga Federal District. The incidence rates are higher in the Republic of Bashkortostan (68,5 °/ooo), the Udmurt Republic (56,1 °/ooo) and the Mari El Republic (25,3 °/ooo). Nevertheless, the mortality rate in the Orenburg region is the highest among the Federal District. The incidence rate in 2007 increased in the Tashlinsky and Ileksky districts and reached 493,0 °/ooo and 786,4 °/ooo respectively. The epidemic process has been registered in 31 of 35 districts.

In accordance to the previously mentioned information, it proved considerable to characterize the epidemic situation at the dislocation of the military units. The current study included comparative clinical and epidemiological analyses of the military men case histories.

The goal achievement implied solving the following problems:

- to estimate the long-term and annual dynamics of HFRS in the territories of the military units dislocation;
- to estimate the probability of the military units dislocation in the territories of different natural HFRS focuses;
- to compare the infection risks within the districts under study;
- to reveal the clinical and epidemiological features of the infectious

process among the patients who had got infected within the territories of the military units.

Materials and methods. Used data from the registration form № 2 "Information on infectious and parasitic diseases" of the Federal government health care "Center of Hygiene and Epidemiology in the Orenburg region" from 1992 to 2010.

The retrospective epidemiological analysis (REA) was performed by means of the method of least squares. The areas of risk were recognized by means of the average annual incidence having been collated with the average regional rate during the research period. HFRS seasonality and the beginning of the epidemic year were carried out by traditional methods. Pearson's correlation coefficient was computed in Microsoft Excel; the significance was tested by having calculated the critical (Ccrit) and criterion (Ccr) values of the Student coefficient. When it was stated that «the criterion > the critical», the probability value was considered as $p<0,05$ and therefore the correlation identified as significant.

The research included 68 case histories of HFRS in the military men who had been getting infected in the units since 1983 till the current year. The patients were divided into 2 groups: group A (37 people) – the place of the infection had remained unknown, the hospitalization point – the Orenburg Military Hospital; group B (31 people) – had got infected with in the garrison territories in the Totsky district. The results were represented as: the group A data // the group B* data; with «*» there was the significant difference denoted («Chi-square»). All the patients were men from 19 to 44 years old (the average equaled 27,4±1,4 // 28,5±3,4 years).

The results. The military units are based in the Totsky, Orenburgsky and Yasnensky Districts of the region. The districts are spatially separated from each other and belong to different prairie provinces, thus have been displaying diverse HFRS morbidity rates [1]. The natural HFRS focuses exist as the Puumala virus has been circulating in populations of bank voles [2]. There is a strong tendency towards steady HFRS morbidity increase (b=0,74). The periodicity makes 2-4 and actually 5 years.

There has been registered no cases of HFRS in the Yasnensky district since year 1970. The long-term trend in the Totsky and Orenburgsky districts is positive, the epidemiological process is asynchronous both in long-term (r=0,462; Ccr=2,148; Ccrit=2,458) and intra-annual dynamics (r=0,271; Ccr=0,976; Ccrit=2,560). The months of seasonal rise are different.

The rates of average annual incidence in the Totsky and Orenburgsky districts take the 11^{th} and 14^{th}places (22,59 and 14,50 cases per 100.000 people) among the other territories of the region. These districts form the

moderate-risk area, while in the Yasnensky district no risk of infection have been indicated. All the districts belong to different natural focuses of HFRS.

During the clinical and epidemiological analysis it was revealed that the clinical diagnoses had been stated in 100% of the cases (36,8 // 41,9%*- mild form of infection; 36,8 // 45,2%* - moderate form and 23,7 // 45,2%* - severe form of HFRS). Both groups (group A and group B) showed scarce percentage of serologically proved diagnoses – 10,8% and 9,7% respectively. Average hospitalization period made 30,6±1,9 // 23,7±3,48* days.

The case histories provided very brief data of the epidemiological anamnesis and did not allow to make conclusions neither about the places of infection, nor about the ways and factors of its transmission, including the types of infection. Most of the case histories having been filled in before the mid-90thhad no chapter for epidemiological anamnesis; the case histories of the Totsky hospital foremost. The case histories of the last decade informed that only a few of the military had admitted the outdoor activities: field outings, fishing and hunting. Only seven patients (18,9%) from group B managed to tell about rodents at the military units and mentioned cases of HFRS among the military.

70,1 // 54,8% of the patients complained of headache, 36,6 // 25,0%* had vomiting. There were no significant distinctions found between the registered non-lethal bleedings; the average frequency was 16%.

15,8 // 43,8%* of the patients had low-grade fever registered, while 52,6 // 21,9%* had febrile temperatures. Duration of fever in 10,5 // 40,3%* of the patients made 3-4 days, in 10,5 // 25,0%* it made 5-6 days, in 60,5 // 12,5%* - over one week. Oliguria was registered in 11 // 4 patients (29,7 // 10,8%*); its duration in 7 // 1 patients (18,9 //2,7%*) made 3 days, in 2 //3 patients (5,4 // 8,1%) – 5 days and in 2 // 3 patients (5,4 // 8,1%) – over 6 days including anuria. Creatinine level in 47,4 // 16,1%* of the patients was increased but remained under 0,2 mmol/l, in 31,6 // 45,2%* this indicator ranged from 0,2 to 0,8 mmol/l and in 0 // 12,9%* of the patients it was over 0,8 mmol/l. Blood urea nitrogen level was increased to 10 mmol/l in 52,6 // 25,8%* of the patients, ranged from 10 to 20 mmol/l in 10,5 // 25,8%* and was over 20 mmol/l in 21,1 // 19,9% of the patients. Proteinuria was revealed in 31,6 // 9,7%* of the patients at the level below 1 mmol/l, in 26,3 // 16,1% it ranged from 1 to 3 mmol/l and in 18,4 // 25,8% was over 3 mmol/l.

Conclusions:

- the long-term trend of HFRS is positive within the whole region in general as well as in the Totsky and the Orenburgsky districts; in the latter, however, the process is more progressive;
- the territories of the Totsky and Orenburgsky districts are charecterised

with asynchrony of the epidemiological process and conceivably belong to different natural focuses of HFRS;

- the territories of the Totsky and Orenburgsky districts belong to the moderate-risk area, the Yasnensky – to the area of no infection risk;

- there were significant clinical distinctions revealed among the patients who had got infected in the different natural focuses of HFRS: there were mainly moderate forms diagnosed in the military men of the Orenburgsky region, mild forms were registered in the Totsky region. The clinical course, however, was characterized by the more severe renal syndromes in the weakened patients from the Totsky region.

Literature:

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