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The influence of Changing Social Conditions and Diet of Indigenous Population on the Dynamics of the Viluy Encephalomyelitis Epidemic Process

ABSTRACT

The paper presents results of the analysis of traditional food, economic activity and lifestyle in foci of VEM. It shows the influence of changing living conditions in the epidemic process of the disease. The positive influence of improving living conditions to reduce the incidence of VEM acute cases VEM, at the same time it creates the problem of diagnosis of the disease in patients with primary chronic form.

Keywords: meningoencephalomyelitis, persistence, immune resistance, socio-economic factors, epidemic process.

INTRODUCTION

A clinical and epidemiological study of Viliuisk encephalomyelitis (VEM) having been conducted intensively since 1950s of the twentieth century to the present, showed that the dynamics of VEM epidemic process demonstrates changes in the ratio of its clinical forms and maintaining relative stability in the General level of the disease. In recent years, the share of the most common progressing cases has reduced and at the same time the number of primary chronic forms of encephalopathy has increased. Quantitatively unequal incidence rate of VEM progressing cases in different periods of time (about 2-3 cases annually in the 1960s, 1 case after 1-4 years in the 1980s, 1 case after 4-5 years in the 2000s) is caused by combination of factors: host susceptibility to the disease state of his immune resistance and feature of ecological niches. VEM pathohistology identified the possibility of self-limiting inflammatory stage, sometimes followed by re-exacerbation of the foci, detected in brain samples of dead from VEM. Self-limiting of brain inflammation in some VEM patients in the chronic stage provided a long period of stabilization during the life of the patients, and the exacerbation occurred against the backdrop of persistent infection [4].

Equally important in understanding the pathogenesis of the VEM, starting with predisposition to the disease, is the study of external and internal environmental factors, particularly dietary habits of the population foci of VEM. To study the dynamics of epidemic process VEM shows the greatest spread of the disease from the some rustic epidemics in Viliuisk area to the Central areas of the Republic in 1950s -70s, clearly associated with migration of the population [3].

The first biomedical understanding of it can be found in the work of T. A. Kolpakova (1933), where in some detail described a small group of patients-boskhongoors (<boskhon> is Yakut name of VEM, means <relaxed>) in Mastakh area of Viliusk district. An important assumptions and conclusions) contains in extant records [6] that can be used as starting points in the study of the nature of the VEM. Relying on an even earlier mention of R. Maak[8], who first described similar to VEM individual patients, you can have an idea about the low level of social and living conditions and extreme scarcity of food for the local population Viliuisk district, continuing until the mid-nineteenth century.

Thus, it is possible to see that the VEM had spread for at least a century and a half amid fierce social conditions of life, contributing to low levels of immunity aboriginal population. These conditions persisted and increased in the period of the Second World War and in the 1950-60s, when registered the highest number of acute/subacute forms of VEM [2]. The decline of the epidemic happened since 1980-90 s, in parallel to improving the quality of life of the local population. The study of individual aspects of this phenomenon deserves attention in relation to understanding the mechanisms of susceptibility and the launch of the manifestation of the pathological process VEM. So obviously, stress triggers VEM factors were and remain more significant in the first its foci, as currently VEM "returned" in these stable foci, having gone from more affluent areas of Central Yakutia.

Aim: To evaluate the influence of living conditions and diet of the indigenous population in the VEM foci on the dynamics of the epidemic process of Viliuisk encephalomyelitis.

MATERIALS AND METHODS

We have studied the materials of our expeditionary epidemiological studies, describing the factors that have potential influence on changes in the dynamics of the epidemiological process and clinical polymorphism of VEM. Data from the first and further expeditions from the 1950s., (387 patients in whom the disease began between 1951 and 2003) were compared with the most recent.

In recent expeditions (November 2006 and February 2007) collected a variety of epidemiological data among indigenous rural population of the Viliuisk and Nyurba districts of the Sakha Republic (Yakutia). Sampling for epidemiological data amounted to 138 people. Three groups of observations were allocated: VEM patients; persons with prolonged contact with patients; a control group of people living in the same localities, but does not have a close contact with VEM patients.

Out of more than 1000 examined patients with suspected VEM, 387 the above cases that meet the diagnostic criteria for reliable VEM [6] were included in this study. A retrospective evaluation of the clinical and epidemiological materials patients have done. Motor function is further examined on a scale of Lindmark [10] in 50 patients with chronic VEM. Social conditions were assessed by questionnaire.

Patients with reliable VEM were identified in 109 of 295 villages in 9 districts (uluses). The ratio of men to women was 42%: 58%. Accordingly, the age of onset of the disease ranged from 11 to 68 years, with an average of 35.0 years; 338 patients (87,0%) died.

A statistical analysis was performed using SPSS 16.0 software. Comparison of the frequency in groups of patients was performed using the Pearson's chi-square test. The values of $p < 0.05$ were considered statistically significant.

RESULTS AND DISCUSSION

In expeditionary studies we have evaluated the migration activity in the period of life of generations considered. Draws attention to the high rate of rural population, stable lives in the same district (87.7%). Low migration activity may contribute to prolonged contact of the inhabitants of the affected villages, including patients with VEM.

But as noted by E. N. Fedorova[9] among the population in 1926 was dominated by those born in rural areas (95.8 per cent). Among births in the village, the proportion of local residents (77.0%) exceeded the proportion of local urban residents are almost twice. In the second half of the 20th century (1989) in the population was

dominated by those born in the cities of 57.5%. Thus, the data indicate a significant decline in the share of rural population of Yakutia in the second half of the 20th century, which is reflected in the manifestations of the epidemic process of VEM.

Dynamics of the incidence of the event demonstrates the change in the ratio of its clinical forms. This ratio was evaluated on the basis of registration within the isolated interval of time because of chronic patients accumulate in the population, creating the impression that chronic VEM significantly prevail over other forms. In accordance with the published data acute and subacute forms of the disease were the majority during the early registration periods in the 1950s. In the 1960s and 1970s there were many acute/subacute cases, but more people moved into the chronic phase. So, 1970-1979, there were 119 patients with reliable VEM, 58 of them had acute or subacute VEM (49%), 31 had acute onset of disease with subsequent development of chronic (26%) and 30 were initially developed chronic VEM (25%). Among those who fell ill in the 1980-ies, acute/subacute VEM was observed in 7%, while in 43% of patients developed a chronic course and the proportion of primary chronic cases increased to 50%, significantly exceeding the figure for 1970-ies ($P < 0.01$) [3].

The impact of the favorable factors found mostly in villages close to the regional centers and Federal highways, compared to distant villages having population more than half of the VEM patients.

To negative factors should be ranked as low employment of residents. Only 69 % of the working population is employed in the national economy. In the villages on average 39% of the families belong to the poor.

A retrospective view in the not so distant Yakutia past allows you to come to an understanding of the many risk factors that influenced the spread of various diseases in the aboriginal population of Yakutia. And although Soviet medicine has made tremendous strides in the improvement of the population of the Republic, malicious echoes of the past can be found in unsolved and severe progressive diseases of the nervous system of our contemporaries. Evidence of such reasoning we can see in the same report the epidemiological unit [5]: *"In a regular household survey of the population, as with the challenges, and, simultaneously, epidemiological detachment was discovered in the Viliuisk district the 25-ve different infectious and parasitic diseases"* And further: *"Undoubtedly, living and social conditions of life of the Yakuts, particularly related to housing and food, contribute significantly to the subsidence of the listed infections and expansive development of all kinds of epidemics"*.

We got in the population survey in the 2006-2007, the conclusion that the group of VEM patients provides itself their own food to a lesser extent compared with the other two groups of contact and control. The same conclusion, about the worst situation in developing their own agriculture, and relates to the breeding of livestock (cows and horses) and to the presence of greenhouse agriculture (table 1). However, this single slice can only indicate the difficulties faced by VEM patients, doing household chores. The members of their family largely engaged in the care of these patients.

Table 1: Own agriculture

Figure	VEM patients	Contact	Control	In all
Not bred livestock	5/26,3	10/14,7	6/15,4	21/15,2
The presence of greenhouse	10/52,6*	54/79,4*	35/89,7*	99/78,6

Note: The numerator is the number of observations, the denominator %

*- $p=0,005$; Pearson's chi-square test

Identify several logic contradicts the data of the questionnaires on traditional activities (see table 2). It turns out that hunting, fishing and harvesting of hay VEM patients, who almost without exception (94,7% - according to the questionnaire survey) are disabled, are more active compared with other compared populations.

The details of the assessment of VEM patients on the scale of Lindmark ($171,2 \pm 9,1$ VEM in patients severe [$n=12$], and $350,3 \pm 51,3$ VEM in patients of mild and moderate severity [$n=38$]) show that most patients with chronic VEM are in the stage of stabilization. In these cases physical labor plays a certain role in rehabilitation of patients.

Table 2: Traditional activities

Figure	VEM patients	Contacts	Control	In all
Hunting	10/52,6*	18/26,5*	6/15,4*	34/27,0
Fishing	6/31,6	16/23,5	4/10,3	26/20,6
Hay	15/78,9	49/72,1	29/74,4	93/73,8

Note: The numerator is the

number of observations, the denominator %.

*- $p=0,011$; Pearson's chi-square test

The research also to carry out certain parallels between the state of resistance of the population and the nature of power, radically changed in the last 2-3 decades. In the past, the diet of VEM patients were not significantly different from the traditionally accepted norms of power in the foci of the disease in the Viliuisk district, characterised by a lack of flour product, salt, predominant use of monotonous small lake fish [5]. Perhaps low calorie diet was defined by a high proportion of acute cases. Contemporary high calorie diet of the population of Yakutia [1, 7] has reduced the acute cases on the increased cases of primary chronic VEM forms.

The positive impact of improving living conditions for the reduction of morbidity, including reliable VEM, at the same time creates the problem of diagnosis of the disease. Encephalopathy status, to which are applied the definition of "organic neurological microsymptoms (ONMS)", "torpid encephalopathy possible and/or probable (questionable) VEM", according to the latest clinical and epidemiological data are becoming more common, whereas the painfulness of the typical VEM forms is significantly reduced.

CONCLUSION

Changing social conditions and diet of the population of Yakutia leads to lower level of acute /subacute VEM cases and to increase the proportion of encephalopathy conditions in the VEM foci, at the same time creates the problem of diagnosis of the disease.

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