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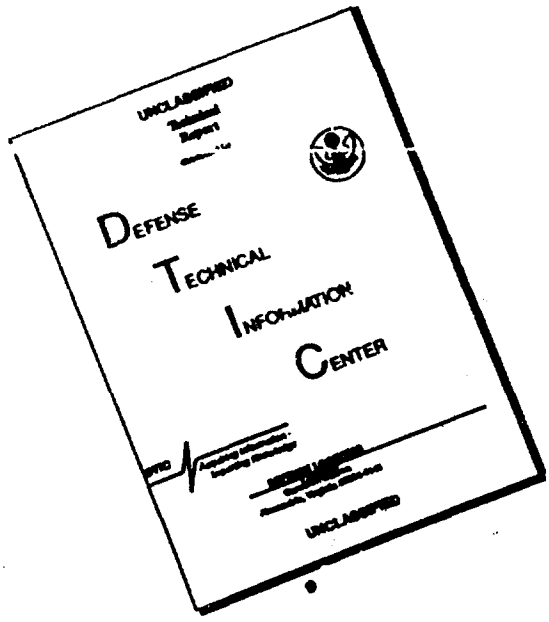

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The Status of the Problem and the Task of the Organs of the Sanitary-Epidemiological Service on the Prophylaxis of Tick-Borne Spring-Summer Encephalitis.

Ye. N. Levkovich and L. N. Ivanova

Responsible tasks on the organization of prophylactic measures against tick-borne encephalitis have been placed before the organs of the Public Health Service.

At the 7th. assembly of the Scientific Session of the D. I. Ivanovskiy Institute of Virology of the Academy of Medical Sciences of the USSR in joint session with the Scientific-Practical Institutions of the Ministry of Public Health of the RSFSR, that took place at Tomsk in February, 1954, the results of the research, scientific-practical, and organizational work on tick-borne encephalitis during the last few years were summed up and the further tasks of the organs of the Public Health Service on the prophylaxis of this disease were noted.

During recent years we have significantly broadened our knowledge of the territorial spread of tick-borne encephalitis in the Soviet Union and also in many bordering countries. At the present time, in addition to the Far East, there are sporadic cases and epidemic outbreaks of this infection noted in Siberia, Kazakhstan, in the Urals, along the Volga, Belorussia, Western Ukraine, and also in the Northwestern Oblasts of the European portion of the USSR.

In 1954 tick-borne encephalitis illnesses were registered in 33 cities, Krays and Oblasts of the Russian Federation. As compared with 1953 the disease rate increased by 45%. The disease rate in the RSFSR in 1952 was 2.9 times, and in 1954 - 4 times greater than in 1948. The most intensive growth of the disease rate of tick-borne encephalitis was noted during the past three years.

On the basis of an analysis of reports, it has become known that in the Oblasts where there was a growth in the disease rate, this has occurred chiefly on account of an exposure of new nidi; this is particularly characteristic for the oblasts of Western Siberia, the Ural and the European portion of the RSFSR: thus in Kemorovo Oblast during 1954 alone there were 173 new places of infection exposed.

Analysis of the disease rate as a whole throughout the RSFSR during the period from 1948 through 1953 shows that the maximum illnesses are usually noted every year in June; in July, as a rule, the curve of the disease rate dropped sharply in comparison with June.

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In 1954, however, the seasonal progress of the disease rate altered sharply as compared with preceding years. The highest rise of the epidemic curve was noted in June-July and even in August the disease rate continued at a high level. The indicated deviations in the movement of the disease rate of tick-borne encephalitis are a result of the meteorological peculiarities of the given year.

In 1954, 35% of the illnesses was registered in 10 oblasts of the RSFSR, including 45.6% in the oblasts of Western Siberia and 29.3% in the oblasts of Ural and Priural. The greatest disease rate was noted in Kemorovo Oblast - 25% of the entire disease rate throughout the RSFSR.

A characteristic epidemiological peculiarity of tick-borne encephalitis during many recent years is the high disease rate of the urban population (as high as 64.2%). A heightened disease rate is also observed among children in ages from 3 to 16 years (from 30% to 53% among the separate nidi). These epidemiological peculiarities are brought about by the sporadic and prolonged residence of large groups of the urban population, including the children, in the woods during the tick season.

New data have been received about the characteristics of natural stations in the separate nidi of tick-borne encephalitis - the presence of illnesses in the forest-steppe regions (Omsk and Kemorovo Oblasts, Altay Kray, Kazakhstan). From this stems the necessity for a thorough study of the parasitic fauna of these nidi and for an investigation on the virus carrying of not only the ticks Ixodes persulcatus and I. ricinus but also of the other species of Ixodidae and Gamasoidea.

In some oblasts of the Northwest of the European portion of the RSFSR (Leningrad, Vologada) there is a neuroinfection observed that has been named diphasic meningo-encephalitis (A.A. Smorodintsev). The pathogen is a neurotropic virus that is difficult to differentiate from the tick-borne-encephalitis virus and the louping-ill virus. The main vectors of this illness are the Ixodes Ticks. All of the illnesses, however, are not connected to a person being bitten by a tick. Up to 60-90% of all the cases of the illness in the separate nidi bear a domestic-group character and are related to the consumption of the raw milk of goats that have been infected by the ticks on the pastures. The alimentary path of infection is possible in not only this form of illness, but also in the typical tick-borne encephalitis through the use of the raw milk of goats, which have been subjected to the bites of infected ticks, (M.P. Chumakov, S.G. Drozdov, Ye. N. Levkovich). An analysis of the data on the sources of infection showed that illnesses resulting from alimentary infection have been registered in Western Siberia, on the Ural and in the Priural (Kemorovo, Sverdlovsk and Molotov Oblasts and the Udmurt ASSR).

A great theoretical and practical interest is presented by the serological proximity of diphasic meningo-encephalitis and tick-borne encephalitis with Omsk hemorrhagic fever, whose area of spread coincides with the regions of mass utilization of virgin lands (Novosibirsk, Omsk and Chkalov Oblasts).

The wide experience of the doctors with this form of illness, the training of virological cadres and the organization of the virological laboratories in many of the oblasts, and also the complex work of local medical institutions with the Institutes of Virology and Neurology of the Academy of Medical Sciences of the USSR have contributed to the detection of tick-borne-encephalitis illnesses and to an expansion of scientific investigations on this problem.

Together with the improvement in the detection of tick-borne encephalitis and similar diseases, the growth of the disease rate by these forms in many regions is caused chiefly by the ill-timed conduct of the prophylactic measures that are necessary in view of the rapid development of industry, the construction of settlements, cities, and railroads, and the large surveying projects on previously virgin territories, which are geographically situated so that the climate, plant-life and animal world are favorable for the vectors of tick-borne encephalitis.

During recent years (1949-1954) there have been many data produced, which have significantly enriched the practical aspect of the battle against tick-borne encephalitis. The important role of birds and animals in the dissemination of the virus in the natural nidi and the possibility of the realization of these findings for epidemiological prognosis have been demonstrated in experimental study of the mechanisms underlying the genesis and extinction of nidi of tick-borne encephalitis, (Ye. N. Levkovich, Ye. S. Tarmonova, A. L. Panina). At the present time preparations of dry, and also dry, refined and concentrated vaccines have been produced. The immunogenic and antigenic activity of these preparations have been proved in experiments on animals and also in limited epidemiological observations (Ye. N. Levkovich). A method for the laboratory diagnosis of tick-borne encephalitis has been perfected, and the possibility of a retrospective and rapid diagnosis of tick-borne encephalitis by the use of the complement-fixation test has been demonstrated (Ye. N. Levkovich, O.L. Rakhkhova, A.I. Ivanenko). The cultivation of the virus in fluid and solid tumor tissues of experimental animals has allowed us to establish the possibility of a significant increase in the activity of the tick-borne encephalitis virus, which is recommended for use in the preparation of high-quality antigens and anti-encephalitis diagnostic sera (A. V. Rshenichnov, A. I. Ivanenko). A method of anti-tick prophylaxis has been developed that consists of the processing of the forest floor and the forest's lower stage (of growth) with preparations having a contact effect, D.D.T. and hexachloro-cyclohexan (See Methodological Instructions, 1954). A single processing during the season gives practically complete extermination of the ticks (N.N. Gorchakovskaya).

A high-percentage decrease in the copiousness of the ticks, as compared with the control, was received in application of D.D.T. powder in a dosage of 0.3 grams/m^2. At the present time, besides the manual processing, a test is being conducted on the hexachloro-cyclohexan bombs N B K (G-17) for combatting the ticks in natural surroundings. The preliminary data indicate the perspectivity of this method.

The concise data that has been cited about the results of the study of tick-borne encephalitis indicate that at the present time serious prerequisites for an organization of effective epidemic counter measures already exist. However, in spite of the significant growth of the disease rate of tick-borne encephalitis in recent years and the necessity of a significant intensification of work on the prevention of an emergence of outbreaks of this grave illness, particularly in the regions of intensified development of agriculture and expansion of lodging, the antiepidemic measures are still not properly developed. Scientific achievements are still weakly introduced into practice, epidemiologists and entomologists are giving inadequate attention to regional epidemiology, sanitational propaganda has been poorly presented to the population, prophylactic vaccination and revaccination of the population are poorly conducted, anit-tick measures are being accomplished on extremely small scales, and the preventive sanitary inspection for selection of areas for childrens' summer health institutions is being unsatisfactorily conducted.

Broadening of the volume and an increase in the quality of work on the specific and nonspecific prophylaxis of the disease and also a development of investigations on the regional epidemiology, particularly on an intensified study of the natural factors in the epidemiology of tick-borne encephalitis, should be the basic tasks of the organs of the sanitary-antiepidemic service for the prevention of illnesses by tick-borne encephalitis.

In developing a plan of action for the prophylaxis of tick-borne encephalitis for 1956 it is necessary to consider the following. The plan should be prepared on the basis of an analysis of the disease rate during the past 2-3 years, taking into account the properties of the separate nidi. For this it is necessary, at the end of the year, to require all Rayon and city sanitary-epidemiological stations to sum up the disease rate, compare and evaluate the natural nidi that have been investigated, and make up maps indicating the location of stationary installations situated in the nidi of tick-borne encephalitis (construction sites, pioneer camps, summer homes, sanitariums, rest homes, etc.) with a scale drawing of the surrounding forest ranges.

It is necessary to draw the industrial organizations into conducting prophylactic measures on the objects situated within the nidi of tick-borne encephalitis, using for this circular-type letters through the ministries of the coal and timber industries, through the Ministry of Geology, etc. It is necessary to calculate the areas requiring treatment in 1956 and forewarn the industrial organizations of the proposed plan for processing in order that they provide the allocation of appropriate means.

The work on the extermination of the vector of tick-borne encephalitis should be significantly enlarged, adopting the various methods as they are indicated (hand processing, HEK bombs (G-17), mechanized processing). In the populated areas situated near natural nidi it is necessary, together with the veterinary service, to organize a systematic treatment of cattle with a D.D.T. preparation, enlisting the assistance of the local population. This is for the purpose of decreasing the number of the vector and protecting the population from the ticks being transported into the settlements.

It is necessary to significantly increase the coverage of the population in the epidemic nidi by specific vaccination against tick-borne encephalitis and to increase the sanitary-epidemiological stations' workers' responsibility for the quality of this important measure. With this, one should provide protection with the immunizations to the groups of the population that are more vulnerable in regards to bites by infected ticks, proceeding from the concrete epidemiological characteristics of the nidus. In an agricultural area, in regional centers and work settlements, the immunizations should be given first of all to the persons living in the given area for less than 3 years, and to the workers of lumbering establishments, forest industry establishments and timber plots, and also to the workers of sovkhozes and subsidiary enterprises. The city population is also subject to vaccination (students, teachers, workers of expeditions, housewives), particularly those having domestic and professional contact with the forest. The sanitary - epidemiological stations should insure an accurate and systematic account of the immunizations and a control over their course and quality.

A personal anti-tick prophylaxis is a very important counter measure: for instance the wearing of protective clothing, inspections and mutual inspections for unattached ticks, and also the use of repellents such as dimethylphtholate and other esters of phthalic acid.

In the midi of tick-borne encephalitis it is necessary to keep an account of the people bitten by ticks and with the first manifestations of a disorder in the well being of these people to inject them intramuscularly with specific serum from convalescents or with hyperimmune equine serum for a period of 2-3 days in therapeutic doses appropriate to the age of the individual.

It is also necessary to provide for an intensification of the sanitary-informational work among the population by means of announcements on the radio and in the press, including the wall bulletins. With this, particular attention should be given to propaganda for repellents and other measures of personal prophylaxis.

All organs of the anti-epidemic service should participate in the prophylaxis of and the battle with tick-borne encephalitis; the parasitological sections and departments must combine their work with the work of the main specialists, of the school-systems' sanitary inspectors and of the section of prophylactic disinfection.

Together with the practical antiepidemic work it is necessary to intensify the scientific investigations on the problem of tick-borne encephalitis. One of the most important tasks is the search for effective therapeutic substances. In view of the fact that to the present time the specific serum constitutes the only therapeutic preparation, it is necessary to perfect it and increase its production to a scale that will meet the requirements of the Public Health organs, and also increase the production of specific gamma-globulin. It is also important to insure the production of the dry vaccine and other vaccines that have been perfected for use against tick-borne encephalitis.

The medical institutes, the institutes of vaccines and sera, and the institutes of epidemiology, microbiology, and hygiene in the oblasts that are endemic to tick-borne encephalitis should include a project on the study of regional epidemiology in their long-range plan of subjects. Considering the great importance of tick-borne encephalitis for many of the oblasts of the Soviet Union, it is necessary to organize intensified virological, epidemiological, zooparasitological and other investigations of tick-borne encephalitis for the different geographical zones. The most fruitful may be a joint work of local establishments with the central scientific institutes and the oblast scientific institutes, which would contribute to an enlargement of its volume and organization on a scientific-theoretical basis. It is also important to organize a scientific-methodological center on the problem of tick-borne encephalitis. We have all of the prerequisites to enable the scientific and practical workers studying tick-borne encephalitis to solve the problems related to the prophylaxis of this disease.