

Equine Encephalomyelitis in Man

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THE viruses of both the Eastern and Western strains of equine encephalomyelitis have definitely been proven to be pathogenic to animals other than horses. White mice, guinea pigs, pigeons, white rats, rabbits, monkeys, sheep, goats, ducks, dogs, pigs, cats, hens and the European hedgehog have all been infected with Eastern strain, whereas Western strain virus failed to infect sheep, pigs, dogs, cats, and the European hedgehog, but it did produce the disease in the other animals mentioned. The infection was artificially started by means of intracerebral inoculation of infected brain tissue. Both strains have been found to produce encephalitis in man through natural infection.

It is suspected that the extremely susceptible duck, pigeon, or rabbit may be carriers of the infection, and it is positively known that certain species of mosquitoes will act as vectors between the carriers and susceptible animals.

Western Strain

Several outbreaks of encephalitis in humans due to the Western strain have been reported, the following case being a typical report of such an outbreak:

During the last week of August and the first two weeks of September, 1937, six cases of human encephalitis were reported from a county in northwestern Minnesota. All were farmers, five of whom had contact with sick horses. The sixth patient had no contact with sick horses at the time of contraction of the disease, but had run a tractor on a farm in North Dakota near the Minnesota border. Equine encephalomyelitis was quite prevalent in the locality at that time. The ages of the six patients ranged from 22 to 51 years of age. The onset of the disease was sudden, with

headache, nausea, vomiting, dizziness, drowsiness and fever. Two of the men died after illnesses of four and five days, while in three of the other cases the acute illness lasted about a week. In the sixth case the acute illness lasted about three weeks.

Thru autopsy it was found that the gray matter of the spinal cord was chiefly affected. About one-third of the nerve cells in the cervical section seemed to be degenerated. No definite hemorrhage could be found, although nests of lymphocytes were profusely scattered throughout the gray matter.

Blood from one of the patients showed neutralization of the Western strain of equine encephalomyelitis. Although this is not enough on which to base a sure diagnosis of all six cases, it is certainly a good sign that the other five possibly could have the disease, especially since all symptoms and histories coincided very closely.

Earlier in the year 1937 three other cases of encephalitis were reported from the region, one case ending fatally, the other two surviving. One of those who lived was a veterinarian who early in the sickness was given hyperimmune horse serum for the Western strain of equine encephalomyelitis. All of the cases had contact with horses sick with equine encephalomyelitis.

Another Outbreak

Another outbreak of the Western strain occurred among the human population of the two large central valleys in California in 1937 and 1938.

The Western strain of the equine virus was recovered from the brain and blood, respectively, of two human cases of encephalitis in this region. Both cases were

shown to be immunologically and serologically similar to the virus of equine origin. No very definite relationship was noted between cases of the equine disease in horses and those in man, since the former did not reach epidemic proportions of those showing clinical symptoms, and the observed cases were only occasionally in concurrent areas. Swampy lands and many mosquitoes were in close association with the districts affected. From the epidemiological evidence it may be likely that the equine virus was transmitted to man through some vector.

Symptoms in the outbreak were mainly headaches, muscle soreness or weakness, vertigo, vomiting, drowsiness, fever, in some cases muscle spasms, and many cases sore throat.

Eastern Strain

In August, 1938, an epizootic of equine encephalomyelitis of the Eastern strain virus broke out in Massachusetts. At about the same time children began dying with an acute encephalitis. The epidemic of encephalitis in children was mainly centered around the town of Brockton at first, but then began spreading to other towns nearby. The five children who first came down with the disease lived in a 15 mile radius of each other and were living in the same area where the equine disease had broken out. Brain tissue was obtained from these first cases as the fatality was very high. This brain tissue was examined and found to contain the Eastern virus of equine encephalomyelitis. In the subsequent investigation that followed, no virus was recovered from mosquitoes, but most of the patients gave the history of have been severely bitten by mosquitoes before the onset of the disease.

The total number of cases which were under observation in this investigation was 38. Eight of these cases were positively identified as being equine encephalomyelitis—in one case the disease was produced in a susceptible horse with the virus obtained from the brain after death—while the remaining 30 were believed to have been the same disease for the symptoms, pathology, and histories were all alike.

The cases were fairly evenly divided between the sexes, but age differences seemed to be quite a factor. Children under two years of age were particularly vulnerable, 32 percent of the cases belonged to that group. 52 percent were under five years of age, and 62 percent under ten years.

The common symptoms exhibited in these cases were slightly different in infants than in older persons. In infants the onset was sudden, with fever, irritability or drowsiness, cyanosis, and convulsions. In older children and in the one adult case the symptoms came on slower, taking from four to ten days. In two cases there was a definite remission of the symptoms lasting for one day. Headache of the frontal region and dizziness were the first complaints in the older patients. In two infants diarrhea preceded the other symptoms, and vomiting occurred in half of the cases. All patients were semi-comatose to comatose on admission to the hospital, and the majority showed continual tremors or muscle twitchings. Rigidity of the neck was a constant feature. Facial palsies were seen in three cases. The temperature was invariably high—102 to 104 degrees—and in the fatal cases continued to rise. Where recovery took place the fever fell and became normal in four or five days. Convulsions and muscular twitchings marked the course of the disease. In the infants a peculiar edema developed about the eyes and in the upper extremities. Cyanosis was marked in all cases.

Deep coma from which the majority of patients never aroused developed shortly after admission. When a patient survived the acute stage, coma and rigidity of the muscles persisted for many days. An occasional patient showed gradual but slow improvement, apparently returning to normal. Some cases suspected of being due to the virus have made complete recoveries, but certain other cases show paralysis, mental changes, or other permanent residuals.

Conclusions

From the foregoing material, when taken as a whole, the following conclusions may be made:

1. Both Eastern and Western strains of equine encephalomyelitis are pathogenic to other animals than horses. The Eastern strain is more pathogenic.
2. An outbreak of equine encephalomyelitis of the Western strain occurred in man in northwestern Minnesota. Six farmers contracted the disease. An epidemic in horses was then prevalent in that locality. Symptoms were headache, nausea, vomiting, dizziness, drowsiness and fever. Two patients succumbed to the disease.
3. Chief lesions in Western virus infection are degenerative changes in the cervical region gray matter of the spinal cord.
4. Three other case were reported from northwestern Minnesota. One case died, the other two lived. One of the cases was a veterinarian, who recovered after receiving hyperimmune horse serum.
5. Another Western strain outbreak was reported from California in 1937-38. A vector seemed to be the cause of infection.
6. Eastern strain virus caused an epidemic in man in Massachusetts. Children were mainly affected, especially young children. Fatalities and infections were higher than those reported for the Western strain.
7. Symptoms that the Eastern virus caused headache, fever, irritability or drowsiness, cyanosis, headache, comatose condition, and muscular spasms.

References

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MEETING

The second regular meeting of the Iowa State College student chapter of the American Veterinary Medical Association was held October 25th. President Connor presided.

The Delta Zeta trio entertained the members with several popular vocal selections.

Mr. C. C. Culbertson of the Animal Husbandry Department was the speaker of the evening. He discussed the relative merits of various high protein and mineral supplement feeds. An open discussion followed the talk.

A dance committee was named by President Connor. It is composed of Rex Puterbaugh, chairman, Elliot Bearer, Al Tietze, and Art Gathman. An educational committee consisting of Ed. Taylor, chairman, Ivan Hember, and E. Cedarleaf was also named.

Surgical Treatment of Colic—Martin.

Abstracted from the *Veterinary Record*, Vol. 50, page 852.

After two and one half days of unsuccessful treatment of a case of colic in a one and one half year old filly, it was found that there was a hard swelling far forward in the medial line of the abdominal cavity. A vaginal incision was made so that the operator could insert his hand into the abdominal cavity. The impacted mass was kneaded and broken down. Administration of cathartics followed. The animal recovered nicely.