Equine Encephalomyelitis

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Equine Encephalomyelitis

The incidence, epizology and control of equine sleeping sickness.

Hans Grell, '42

During the recent Iowa State Veterinary Medical Association meeting, Dr. H. W. Schoening, Chief of the Pathological Division, B.A.I., discussed both the spread of equine encephalomyelitis and the progress made in its control, and attempted to deduce from available information what the immediate future holds with respect to this disease.

Statistics

Recent statistics on equine encephalomyelitis are as follows: In 1935, there were 23,512 cases reported in the United States, in 1936 there were 3,929 cases, in 1937 and 1938 there was an increase of 173,889 and 184,862 cases, respectively, and in 1939 there was a drop to 8,000 reported cases.

Most of the 18,000 cases reported for 1940 appeared in the latter part of September and October whereas in previous years the peak of the disease appeared during the latter part of August and the first week in September.

Incidence

There has been an increase in the incidence of the disease west of the Mississippi this year over last year, whereas east of the Mississippi the incidence has remained the same or has decreased. There is a possibility that we may be again facing, within the next year or two, another epizootic of the disease. In other words, it appears probable that equine encephalomyelitis is not a “sleeping dog”, but is again possibly on the move.

Since the work of Kelser, it has been found that at least 10 species of mosquitoes are capable of transmitting the virus of the disease experimentally. Tests thus far reported for one species indicate that the virus of equine encephalomyelitis does not pass from one generation of mosquitoes to the next through the eggs and larvae. It has been found, however, that the virus actually multiplies in the bodies of at least one species of mosquitoes and remains for the life of the insects. Attempts to find virus in mosquitoes and other insects in nature have been negative. The assassin bug, Triatoma sanguisuga, and the Rocky Mountain fever tick, Dermacentor andersonii, have shown the presence of equine encephalomyelitis virus. These, as well as other ticks, are relatively long lived, and it is easy to conceive of their carrying the virus through the winter or even through several years and then transmitting it to susceptible species for further propagation.

The question as to what becomes of the virus between epizootics is of extreme interest, but there is no explanation to this phenomenon yet. It is assumed that it is perpetuated in some species other than equines.

Susceptibility

Man and a large variety of mammals and birds are susceptible to infection with the virus of equine encephalomyelitis. With such a wide variety of species susceptible to the disease and with a large number of mosquitoes and other insects capable of its transmission, the problem

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of the control of the disease in horses, for
the present at least, must depend on rais­
ing the immunity of the horse population
to the disease.

In 1938, brain tissue vaccine was the
only vaccination procedure, aside from
serum, available. A vaccine against equine
encephalomyelitis employing the chick
embryo was developed that year. The
virus in the chick embryo was destroyed
or rendered inactive by 0.4 percent for­
malin.

More than three million horses were
given two doses of the chick-embryo vac­
cine in 1939, and undoubtedly, the exten­
sive use of the vaccine played a very im­
portant part in the reduced incidence of
the disease that year.

In spite of the highly gratifying results
from the use of this vaccine, certain dis­
advantages appeared. These had to do
with the reactions in certain horses fol­
lowing the administration of the vaccine.
While these reactions were first reported
in 1939, they were again reported in the
spring of 1940 to a considerably larger ex­
tent, considering the number of animals
covered at the time. No satisfactory ex­
planation has been advanced as to the
cause of these reactions. Extensive bac­
teriological work conducted with various
vaccines failed to show that the products
were contaminated. It is quite probable
that the reactions could be due to any
one of the following:

(1) Faulty technic in the administra­
tion of the vaccine, with introduction of
infection from the outside.

(2) The deposit of the second injection
at or near the site of the first.

(3) The sensitivity of certain animals
to chick protein or foreign proteins in
general.

Work was undertaken in the Bureau
looking to a method of vaccination which
would eliminate or reduce the possible
hazard of reactions. By the use of the
intradermic method of vaccination, it was
found that an effective immunity could
be produced. The immunity produced by
two injections of 1 cc. of the vaccine intra­
dermally was as effective as two 10 cc.
doses of the same vaccine given subcu­
taneously.

Any vaccination technic should be con­
sidered a highly professional procedure
since knowledge is required concerning
the disease for which vaccination is prac­
ticed, the need of such vaccination, and
the method of procedure. It is always ad­
visable and desirable to have sterile in­
mstruments in vaccination procedures. The
intradermic method of vaccination re­
quires a certain amount of skill and
knowledge of anatomy and is, therefore,
a procedure which should be left entirely
in the hands of the veterinarian.

Two 1cc. injections of the vaccine given
at 7-day intervals constitutes the intra­
dermal injection technic. The injection is
made into the skin on the middle third of
the lateral aspect of the neck. Usual
asepsis is observed at the site of injection.
The injection is made using sterile 18 or
20-gauge, 1-inch needle, and a sterile
syringe. The second injection is given
on the opposite side of the neck. No dif­
culty has been experienced in injecting
an amount up to 1 cc. intradermally.

The results of the intradermic method
have been quite satisfactory, both from the
standpoint of reactions and the immunity
produced. The Veterinary Corps of the
U. S. Army has treated about 6,000 horses
by the intradermic method with entirely
satisfactory results.

Research in the improvement of vac­
cines has continued. Research men have
been able to concentrate encephalomye­
litis vaccine manifold by a process of
lowering the pH, centrifugation, and an
immediate readjustment of the pH to 7.0.
By this method of concentration it is re­
ported there is an elimination of 90 per­
cent of the total protein orginally present.

From all indications it appears quite
probable that the intradermic method of
vaccination will be the only method used
in the coming season. It therefore be­
hoves veterinarians to become familiar
with the details of the technic of this
method of administration.

The Veterinary Student