Equine Protozoal Myeloencephalitis: Acupuncture Diagnosis

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The most accurate method for the diagnosis of equine protozoal myeloencephalitis is the identification of clinical signs and the presence of anti-Sarcocystis neurona antibodies in cerebrospinal fluid; acupuncture is not useful. Author’s addresses: Equine Internal Medicine Consulting, 3288 Valhalla Dr., Lexington, KY 40515 (Fenger) and Dept. of Veterinary Science, 108 Gluck Equine Research Center, University of Kentucky, Lexington, KY 40546-0099 (all other authors). © 1997 AAEP.

1. Introduction
Equine protozoal myeloencephalitis (EPM) is a neurologic disease of horses that results from an infection of the central nervous system (CNS) by the protozoal parasite, Sarcocystis neurona. The prevalence of EPM is unknown, but it is believed to occur sporadically. The most accurate diagnosis for this disease is the combination of the identification of clinical signs and the detection of anti-S. neurona antibodies in cerebrospinal fluid (CSF).

Protozoa were initially identified in the lesions of EPM in 1974.1 The diagnosis of EPM for the following 18 years was based on clinical presentation and the ruling out of other causes of neurologic dysfunction. The in vitro culture of S. neurona permitted the development of diagnostic tests for EPM. Antigen analysis by indirect immunofluorescent antibody (IFA) was compared with Western blot (immunoblot). Western blotting was determined to have greater specificity for the detection of exposure to S. neurona.2 This method was expanded to the detection of anti-S. neurona antibodies in CSF, and it was found to have utility for the diagnosis of disease.3

Recently, interest has developed for a less invasive technique to diagnose EPM. The diagnosis of EPM by acupuncture, and specifically by reactivity on the point gall bladder 32 (GB32), has gained popularity in recent years.4 Therefore, a double-blind controlled study was undertaken to determine the relationship between the acupuncture and traditional methods of diagnosis for EPM.

2. Materials and Methods
A. Study Design
The study design was a double-blind comparison of two diagnostic methods. The combination of the presence of neurologic signs with a positive CSF was considered the standard for a positive diagnosis of EPM. Positive reactivity over a combination of acupuncture points, including GB32, was evaluated against this standard, and sensitivity, specificity, and positive and negative predictive value were determined. Horses that exhibited no evidence of possible neurologic disease and also tested negative for reactivity over GB32 were not tested for EPM by
CSF collection, as requested by the trainers. Horses
with neurologic signs that tested negative for EPM
by Western blot and polymerase chain reaction were
considered to be EPM negative.

B. Initial Case Selection
The initial study population included all of the
horses in a training barn at a racetrack under
management of a single horse trainer (N = 23). All
horses in the stable underwent physical and neuro-
logical examinations by a single investigator. All
horses also underwent simultaneous acupuncture
evaluations by a second veterinarian experienced in
acupuncture. Horses that exhibited neurologic signs
or reacted positively to the acupuncture points con-
sidered to be unique for EPM were tested for the
presence of anti-S. neurona antibodies in CSF as
determined by Western blot.

C. Additional Cases
The second study group consisted of 90 horses in a
training facility under the management of a single
horse trainer and was independently evaluated by
the same two veterinarians. The acupuncturist
evaluated the study group ~6 weeks after an initial
neurologic examination and 2 weeks prior to a
subsequent neurologic examination by the investiga-
tor. Horses that exhibited neurologic signs or were
considered to have EPM as determined by acupunc-
ture had their CSF sampled and tested for the
presence of anti-S. neurona antibodies. Several
horses had been diagnosed during the previous
examination and had been under treatment for 3
weeks when they were evaluated by acupuncture.

3. Results
A total of 113 horses was evaluated by both acupunc-
ture and with the standard diagnostic method for
EPM. The initial group of 23 horses had a total of
nine EPM cases identified by conventional diagno-
sic methods, and 17 EPM cases as determined by
acupuncture. The second group of 90 horses had a
total of 42 EPM cases by conventional diagnostic
methods and 15 EPM cases by acupuncture.

The total group of 113 horses had the results
shown in Table 1. The sensitivity, specificity, and
positive and negative predictive values are listed as
follows: sensitivity, 24%; specificity, 68%; positive
predictive value, 38%; and negative predictive value,
52%.

Treatment consisted of pyrimethamine (1 mg/kg q
24 h) and sulfadiazine (20 mg/kg q 24 h). All horses
testing positive by either method were treated in the
initial group of 23 horses. Follow-up data are not
available for this group. In the second group of
horses, all horses testing positive by Western blot
or polymerase chain reaction using CSF were treated
at least 4 months, and in some cases a negative CSF
was obtained prior to the discontinuation of treat-
ment. All horses in this group improved and had
no relapses. All horses testing positive by acupunc-
ture and negative by conventional methods were
treated for 1 month. There was no change in cli-
nical signs of any horses in this group during this time
period.

4. Discussion
The acupuncture diagnosis of EPM as determined by
reactivity over a series of acupuncture points, includ-
ing GB32, was objectively evaluated by a double-
blind controlled study. The relationship between
acupuncture and conventional methods for the diag-
nosis of EPM is poor, with the best relationship being
specificity of 68%. Specificity is the probability of
a negative acupuncture test when a horse has no
neurologic signs and, if tested, tests negative for S.
neurona on CSF by Western blot. It is logical to
assume that most horses would test negative by both
conventional and acupuncture methods. Most nota-
ably, the acupuncture sensitivity, or ability of the
acupuncture test to detect active disease, was only
24%. Therefore, this test missed the diagnosis of
EPM 76% of the time.

The initial study included only 23 horses, of which
17 horses tested positive for EPM by acupuncture.
This initial group of horses was evaluated prior to
the purported identification of a separate set of
points diagnostic for herpes myelitis, which may
have accounted for the high proportion of horses that
tested positive yet failed to exhibit clinical signs, or
test positive on CSF by Western blot for EPM, suggesting that at least some of these
horses should have tested positive even if they had
herpes myelitis. This finding calls into question the
validity of acupuncture diagnostic methods for the
diagnosis of EPM or herpes myelitis.

The possible accidental inclusion of an acupunc-
ture diagnosis of herpes myelitis with the EPM
diagnosis in this initial group of 23 horses prompted
the further evaluation of an additional 90 individu-
als. This group included horses that had been
diagnosed over the course of 3 months prior to the
initial acupuncture evaluation. This second group
of horses had less association between the two
diagnostic techniques. The argument could be made
that because some of the horses had been treated for
as long as 3 weeks before the acupuncture evalu-
ation, they showed sufficient improvement to test
negative on GB32 and associated points. However,
all of these horses continued to exhibit neurologic

Table 1. Evaluation of 113 Horses by Acupuncture and CSF Sample

<table>
<thead>
<tr>
<th>Acupuncture</th>
<th>Conventional Diagnosis</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Disease</td>
<td>No Disease</td>
</tr>
<tr>
<td>Positive</td>
<td>12</td>
<td>20</td>
</tr>
<tr>
<td>Negative</td>
<td>39</td>
<td>42</td>
</tr>
<tr>
<td>Total</td>
<td>51</td>
<td>62</td>
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signs at that time, and 3 weeks is not a sufficient duration of time to clear the organism from the central nervous system. Therefore, even if the acupuncture point fails to test positive once the disease has been treated, it cannot be useful in the many cases in which the client begins treatment of the horse before requesting veterinary acupuncture intervention.

In conclusion, the diagnosis of EPM by detection of reactivity over point GB32 in combination with other points is poor compared with that by conventional diagnostic methods.

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References