

# Studies on the Clinical Diagnosis of Equine Infectious Anemia

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In 1904, the famous Carré and Vallée reported that equine infectious anemia (EIA) is caused by filtrable virus. Since then, great efforts have been made by many investigators from various angles to clarify the nature of this disease. Contrary to the anticipation, however, they were not always successful in giving satisfactory results up to the end of World War II.

Even after the war, persistent studies have been carried out by research workers related to the Ministry of Agriculture and Forestry and other

institutions. In consequence, epoch-making results have been obtained for the past ten years. For instance, the etiological agent of EIA was observed by the electron microscope and its morphology described. It was successfully propagated in the culture of equine leukocytes to produce antigen with which it was possible to perform a serological test. In spite of such gradual progress as mentioned above, there are still many problems to be settled about this disease. In particular, nothing reliable has been established about the diagnosis, treatment, or prevention of the disease up to this time.

In the present studies, chronic EIA

was produced experimentally in 7 colts by inoculation with EIA virus. These animals were examined in detail for general clinical, hematological, electrocardiographical, and blood pressure findings. The results obtained from these examinations seem to be available for the diagnosis of chronic EIA. This paper deals with these results.

1) General clinical findings.

When the animals were inoculated with EIA virus, they began to manifest clinical symptoms after an incubation period of about 12 days. All of them took a chronic course of disease, except one, or horse No. 1, which took an acute course of disease. The six

animals of chronic form exhibited recurrent fever, without exception. In the body temperature curves of these animals, the reversion of the diurnal difference was observed frequently.

As for the reversion of body temperature, its importance in the diagnosis of EIA has been mentioned in previous papers. Then it was studied scrupulously with the following results. The reversion of body temperature appeared more frequently after inoculation than before inoculation. The ratio of the frequency of its appearance before inoculation to that after inoculation was almost 2:3. Moreover, the diurnal difference in reversed body temperature after inoculation was large. The

arithmetical mean of reversed body temperature was smaller in value than that estimated on the previous day. These results are considered to indicate "the location of temperature." On the other hand, the reversion of body temperature appeared in the descending stage of febrile fit and was observed continuously for some time immediately after this stage (a type accompanied by a large peak).

Furthermore, an isolated reversion of body temperature was noticed immediately after a transient fever which had appeared during the period of normal body temperature (a type accompanied by a small peak).

The two types appeared alternately one after the other, showing a kind of rhythm, when the disease took a form of recurrent fever.

These results are considered to indicate "the morphological location," in contrast to the above-mentioned "location of temperature."

By the way, it has been reported that such reversion of body temperature as this has often been noticed in the case of tuberculosis. In Japan, however, no papers seem to have been published to deal with tuberculosis in horses. Therefore, it would be safe to regard the reversion of body temperature as a sign characteristic of EIA.

There were no particular changes in the respiratory rate. The pulse rate showed a tendency to increase a little even after body temperature had returned to a normal level.

## 2) Hematological findings.

In general, erythrocytes revealed a decrease in count. They increased in count rather frequently, and it was difficult to discuss the erythrocyte count as a whole.

Leukocytes increased transitionally in count after inoculation. Generally speaking, they decreased gradually in count with the lapse of time. In the differential leukocyte count, monocytes increased comparatively and the relative

count of lymphocytes remained to be greater than that of neutrophils even after inoculation. These two types of leukocytes changed in absolute number within such range that the ratio of relative count was almost always maintained between them.

Conjunctival findings revealed the occurrence of anemia and jaundice. In some animals, the erythrocyte count was 6.8 millions and the conjunctivae were yellowish pale. In others, the erythrocyte count was 5.4 millions and the conjunctivae were filthy yellowish pink or pale.

Hemoglobin and hematocrit values showed a striking decrease after

inoculation.

### 3) Electrocardiographical findings.

It was difficult to draw any definite conclusion on the changes of R-R, P-P, P-Q, or Q-T interval, since there were individual differences and disparity of time of measurement. Those changes were small.

The P wave mostly prolonged and decreased in amplitude. Double-headed changes were seen only in a few animals.

The QRS group exhibited a slight prolongation in duration, being an rS type of low amplitude.

The T wave hardly changed in duration, but underwent reversing or diphasic changes after inoculation.

The ST portion hardly changed in duration. It should be noted that this portion showed an increase in all the horses, except No. 2.

4) Blood pressure findings.

As anticipated, blood pressure decreased with the lapse of time after inoculation. It went down below 100 mmHg.

The above-mentioned findings obtained from the horses inoculated with EIA virus may not be enough to be regarded conclusively as all the clinical findings of chronic EIA. Nevertheless, it is presumed that especially the following three items may be significant as important factors for the diagnosis.

of EIA.

(a) The reversion of body temperature could be located morphologically and from a viewpoint of temperature. Its frequent occurrence and an increase in diurnal difference of its value were observed.

(b) In the differential leukocyte count, monocytes increased in count. Moreover, lymphocytes remained to be larger in relative value than neutrophils in <sup>(the)</sup> inoculated animals as in healthy intact young horses. These points should be taken into consideration when the diagnosis of EIA is to be made on young horses.

(c) In electrocardiographical

findings, electromotive force increased in one horse (No. 1) of acute form and decreased generally in the other horses of chronic form. On the other hand, it was generally <sup>(an)</sup> outstanding change that there was an increase in the ST portion.