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EQUINE LEPTOSPIROSIS WITH SOME CLINICAL OBSERVATIONS (1)

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Résumé

LEPTOSPIROSE EQUINE : ENQUETE SEROLOGIQUE ET OBSERVATIONS CLINIQUES. — Au cours d'une enquête sérologique sur la leptospirose équine en Egypte, on a observé les fréquences suivantes de réactions sérologiques positives :

- Chevaux hospitalisés 65/113 (57.5 %).
- Anes hospitalisés 90/125 (72 %).
- Chevaux apparemment en bonne santé 21/72 (29,2 %).

Les sérums de ces animaux réagissaient principalement aux sérotypes butembo, pomona, icterohemorrhagiae et grippotyphosa.

En Egypte, les équidés vivent au contact de la population humaine et peuvent donc constituer une source d'infection par les leptospires.

D'un point de vue clinique, il est très possible qu'il y ait une association entre la réaction sérologique et des lésions oculaires, podales et de l'ictère chez les équidés.

Introduction

Leptospires in equines has been reported in many parts of the world and is usually implicated with periodic ophthalmia, recurrent iridocyclitis and uveitis in these animals (Morter, et al., 1969).

(1) The opinions and assertions contained herein are the private ones of the authors and are not to be construed as officials or as reflecting the views of the department of the Navy or of the Naval Service at large.
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In Egypt, horses and donkeys are animals of common use in cities and villages as a means of transportation, for policemen and for race and exportation purposes. No leptosporal serologic studies have been done on horses nor have there been any isolation attempts reported from these animals in Egypt. In a survey on domesticated animals in Egypt, nine of thirty one apparently healthy donkeys were found to have leptospiral antibodies in their sera (Moronpot and Barsoum, 1972). The present investigation was undertaken to determine the incidence of leptospiral antibodies in equine sera from apparently healthy and diseased animals.
Material and methods

Blood samples were collected from 113 diseased horses of different ages (2.5 - 11 years) and from 125 donkeys (3 - 9 years) hospitalised for a variety of surgical and medical reasons. None of the hospitalised patients had proven or suspected infectious disease and none of these patients was clinically diagnosed as having leptospirosis. Blood samples also were collected from 72 apparently healthy horses (3 - 9 years) raised in either private or governmental farms.

Blood samples were collected and sera, separated from clotted blood, were kept at \(-20^\circ\text{C}\) until tested by the microscopic agglutination (MA) test (Schüffner and Mochtar, 1927); and Gochenour et al. (1953) using the following serotypes and strains of Leptospira: canicola Hond Utrecht IV; grippotyphosa Moskva V; wolfi 3705; javanica Veldrat Batavia; pomona Pomona; icterohemorrhagiae M-20; autumnalis Akiyami A; australis Ballico; bataviae Van Tienen; hebdomadis Akiyami B; pyrogenes Salinem; tarassovi Perepelican; butembo Butembo; ballum Mus 127; patoc Patoc 1; andamana CH 11; sentot.

Antigens were 4-7 days old Leptospira cultures grown in Ellinghausen's media (Difco, Detroit, Michigan). Sera were first screened against the Leptospira serotypes at a final serum dilution of 1:32. In the screening test, 0.05 ml of each Leptospira suspension was mixed in a microtiter plate with 0.05 ml of serum diluted 1:16 with pH 7.2 phosphate buffered saline. Plates were shaken and then incubated for 3 hours at 30°C. Drops from each serum-Leptospira reaction mixture were transferred to microscope slides and examined for the presence of leptospira agglutination by low power darkfield microscopy. Sera which agglutinated one or more leptospira serotypes were titrated against each agglutinating serotype. Using a 4-fold dilution scheme, the highest dilution producing greater than 50% agglutination of leptospira organisms was the titer. Known positive and negative sera and saline were used as controls.

Results and discussion

Ninety out of 125 (72.0%) hospitalised donkeys showed leptospiral antibodies in their sera at a titer of 1:128 or more and 65 out of 113 (57.5%) horses' sera from hospitalised animals were positive at 1:128 titer or greater. However, only 21 of 72 apparently healthy horses showed leptospiral agglutinins in their sera at that titer. Results of MA test showing titer frequency distribution and predominant serotypes for positive sera are given in table 1.

The present investigation might show that
Equine leptospirosis in Egypt is common. In 113 hospitalised mature horses, it was found that 57.5% of the animals had agglutinins for *L. butembo*, *L. sentot* and *L. icterohemorrhagiae*. It was also revealed that a 72.0% reaction rate for *L. butembo*, *L. pomona*, *L. icterohemorrhagiae* and *L. canicola* was observed among hospitalised adult donkeys. Table 1 shows the positive leptospiral titers whether the animals developed clinical diseases such as periodic ophthalmia or not. A similar persistence of leptospiral titers in the blood serum of cattle had been pointed out by Roberts (1958) with no associated foci of leptospiral infections. The location of the source of stimulus for the formation of persistent and high leptospiral titer in the serum seems to be useful and needed.

The incidence of leptospiral seropositivity in hospitalised donkeys and horses is very high proportional to other domestic animals and to apparently healthy donkeys previously surveyed in Egypt (Moronpot and Barsoum, 1972). This may indicate that a number of diseased equines may have leptospiral infection. There is a significant difference between seropositivity in hospitalised horses (57.5%) and non-hospitalised horses (29.1%). However, the percentage seropositivity in the last group is relatively high as these animals are raised in special or governmental farms for the purpose of breeding, race and exportation.

A strong clinical evidence supports the relationship between equine leptospirosis and periodic ophthalmia. Periodic ophthalmia has been observed in eleven of the hospitalised horses (9.7%) of this study. The clinical signs of ocular involvement were previously described (Bryans, 1963; Cross, 1966; Jones, 1942). The eleven affected horses of the present study showed common signs of catarrhal conjunctivitis, tender swollen eyelids, slight cloudiness of the cornea, epiphora, congestion of the pericorneal vessels and an exudate in the anterior chamber. Two of these horses showed progressive clinical signs that eventually terminated in blindness: opacity of the lens capsule and limited iris mobility due to synchia. It is possible that these ophthalmitis signs developed within a long period of time following the acute phase (Roberts, 1958). The detection of leptospiral agglutinins in these horses appeared to be more than coincidence and not expected at this time, although it provided further evidence that leptospirosis is a cause of periodic iridocyclitis. In 1947, Rimpau initially made the association between iridocyclitis and leptospirosis based on the presence of detectable leptospiral agglutinins in the sera. The pathogenesis of periodic ophthalmia has been discussed by Morter et al. (1969) based on two hypotheses: sensitisation of the ocular tissues during the stage of leptospireaemia or the persistence of the leptospira in the intraocular tissues. Canker of the hoof was treated surgically in 18 of the hospitalised horses with positive sera (16%). Although there is no specific causal organism of canker of the hoof, spirochaetes have been isolated from affected tissues (Johnson, 1972).

Clinical signs of icterus were observed in 16 hospitalised horses (14%) and 9 donkeys (7.5%) with leptospiral titers in the blood serum (serotypes *L. icterohemorrhagiae* and *L. pomona*). The symptoms were characterised by bilirubinaemia, high body temperature and edema of the lower parts of the body. Other signs included: slight depression, icteric mucus membranes secondary to hemolytic anemia and leukocytosis. The period of fever went unobserved and other clinical signs were regarded as clinical manifestations of other conditions. It is worth to mention that detection of leptospiral agglutinins at this time was considered the first evidence of a previous leptospiral infection.

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Summary

In a serologic survey on equine leptospirosis in Egypt, the following incidences of leptospiral serosensitivity were found:

1. Hospitalised horses 65/113 (57.5%).
2. Hospitalised donkeys 90/125 (72.0%).
3. Apparently healthy horses 21/72 (29.1%).
Sera of these animals were mostly reacting to serotypes butembo, pomona, icterohaemorragiae, and grippotyphosa. Equine in Egypt are close animals to humans and may constitute a potential source of leptospiral infection.

From the clinical point of view, it is very possible that ocular, hoof lesions and icterus in equines would be expected with leptospiral titres.

References


