FREQUENCY OF OCCURRENCE AND PATHOLOGICAL ALTERATION IN HORSES INFECTED WITH *SARCOCYSTIS*

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SUMMARY: The prevalence frequency of *Sarcocystis* and pathological changes of muscular tissues was studied in 237 equines older than 2 years coming from seven states and slaughtered in Apucarana, Paraná, Brazil. Pieces of the tongue and oesophagus were ground and processed for parasitic cysts under a stereoscopic. One hundred and sixteen equines (48.9%) were infected. showing that muscular tissues around or close to the cysts did not demonstrate inflammatory reactions.

KEY WORDS: *Sarcocystis*, cysts, tongue and esophagus, equines.

INTRODUCTION

Equine sarcocystosis is caused by a protozoan of the *Sarcocystis* genus (LANKESTER, 1882), characterized as a coccidia by FAYER (1972) who elucidated the biological cycle identifying the prey – predator relationship. Muscular cysts have commonly been found in the muscular tissues of the intermediate hosts (domestic animals, reptiles, fishes and birds (LEVINE & TADROS, 1980).

The horse is the intermediate host of the following species: *S. bertrami* (DOFLEIN, 1901), *S. equicanis* (ROMMEL & GEISEL, 1975) and *S. fayeri* (DUBEY *et alii*, 1977), although there is still some controversy among researches about listing all these species as horse parasites.

Beside the muscular cysts, meronts have been found in the central nervous system of horses, mainly in the spinal chord, causing mielitis and mieloencefalitis. A particular species is involved: *S. neurona* (DUBEY, 1976 and MAYHEW *et alii*, 1976).

Equines become infected through the ingestion of either sporocysts or sporulated oocysts found in water or feed contaminated by the definitive host, the dog. Under natural conditions, muscular sarcocystosis seems to have patogenicity for domestic animal, despite the high prevalence found for cattle and the low lack of severe clinical signs in the infected animals (LEVINE, 1961).

Both chronic (FAYER *et alii*, 1983) and acute (FAYER & DUBEY, 1982) disease have been produced through experimental infections. Anorexia, weight loss, anemia, ataxia, low levels of seric proteins, abortion and death were reported when high doses of sporocysts were used (ERBER & GEISEL, 1979 and STALHEIM *et alii*, 1980). Muscular atrophy, fur loss and inflexibility of limbs with locomotion impairment have also been discribed (DUBEY, 1977).

MAYHEM & GREINER (1986) found fever and a mild anemia as the main clinical signs, when they orally infected horses with sporocysts from dogs. BOTELHO (1985) experimentally infected calves and reported the following symptoms: fever, anorexia, continuous weight loss, salivation, fur loss mainly in the neck, ears and tail hair, tear *lacrimatis shedding*, decubitus and death. In adult females, beside these symptoms, abortion and placenta retention can also occur, and the foals who succeed to birth are weak and use to die a few days later (SÁ, 1986).

The present work was aimed at the determination of

Sarcocystis frequency in horses as well as to study the pathologic alterations in the affected muscular tissue.

MATERIALS AND METHODS

The collected material was muscular tissue (tongue and esophagus) from 237 equines aged more than 2 years, from slaughterhouse located in the municipality of Apucarana, Paraná State, Brazil. The animals came from different Brazilian states: 107 from São Paulo, 53 from Paraná, 41 from Mato Grosso do Sul, 10 from Mato Grosso, 12 from Goiás, 10 from Minas Gerais and 4 from Rio de Janeiro.

After routine sanitary inspection procedures, the tongue and esophagus of each animal were removed, a total of 474 samples. The tissues were placed in plastic bags, identified with origin of the animal, date of collection, and sent to the Laboratory of Parasitology and Pathology of the Londrina State University. Excess of connective tissue and fat were removed, and the samples were washed and sliced in 20 gram pieces. Each was then placed in a beaker (100ml) with 100 ml of distilled water, then ground for 15 seconds, with a feed processor.

The material was filtered through a gauze folded four times, and decanted in a sedimentation glass for 20 minutes. The supernatant was then poured into a Petri dish with 2 or 3 drops of distilled water and examined for sarcosysts under a stereomicroscope.

Small muscular tissue fragments were separated for histological examination. They were wounted in paraffin, cut in 3 µm slices and stained with haematoxilin – eosin (H.E.). Slides were examined with a light microscope.

RESULTS AND DISCUTION

Results showed that of the 237 equines, 116 (48.9%) were parasitized. As to origin, of the 107 equids from São Paulo State 52 (48.6%) presented sarcocysts; of 53 equids from Paraná State 24 (45.2%) were paraitized; of 41 animals from Mato Grosso do Sul State 21 (51.2%) were positive; of 12 from Goiás state 8 (66,6%) were infected, 10 from Mato Grosso State 6 (60,0%) were positive; of 10 animals from Minas Gerais State 5 (50.0%) were positive, and there were 4 negative cases from the Rio de Janeiro State.

As to the muscular tissues used, of the 116 (48.9%) parasitized equines 41 (35.3%) presented cysts in the tongue, 26 (22.4%) in the esophagus and 49 (42.2%) in both sites.

As to sex, of the 129 males studied, 56 (53.4%) were infected and 73 (56.6%) were negative. Of the 108 females 60 (55.5%) were positive and 48 (44.4%).

There was little variation in the frequency sarcocysts suggesting that the occurrence infection of the intermediate host does not depend upon the kind of husbandry management. The common finding of dogs in rural properties, that pass sporocysts in the feces and contaminate the pastures, can explain the fact the parasitism is spread throughout the locations studied. Another interesting point is that the animals studied with few exceptions, were old of defective animals no longer useful for reproduction or work, being then discarded and sent to slaughter.

In Brazil, LUZ PEREIRA *et alii* (1992) made histological examinations of 102 equines from several States, and found a occurrence of 23,5% lower than the results presented here (48,9%), because of the different diagnostic techniques used.

The frequencies found by other local researchers were also lower than the results of this paper: ROMMEL & GEISEL (1975) found 23% of horses to be parasitized and ERBER & GEISEL (1981) found 15.5%.

DUBEY *et alii* (1977) found in the USA, indexes ranging from 2 to 21% and FREESTONE & CARLSON (1991) diagnosed only one case among the 67 animals studied. In England, GUNN & FRAHER (1992) found sarcocystis in 3 (4%) of 74 animals examined.

On other hand, ARRU & COSSEDU (1975) found a high prevalence in Italy, among the 225 equines studied, 116 (74.2%) were found to be positive. GORMAN *et alii* (1981) in Chile, found 88 (88%) of animals positive.

As to the histopatological examinations, sarcocysts diagnosed in the tissues were intact and no inflammatory reaction occurred around or near these cysts (Fig. 1). Mononuclear cells were found near to parasitized fibers in some slides (Fig. 2).

Fig. 1 – Histological slide of equine tongue, showing a mature sarcocyst with bradizoites inside. No inflammatory reaction was observed (haematoxilin – eosin, 1100x).

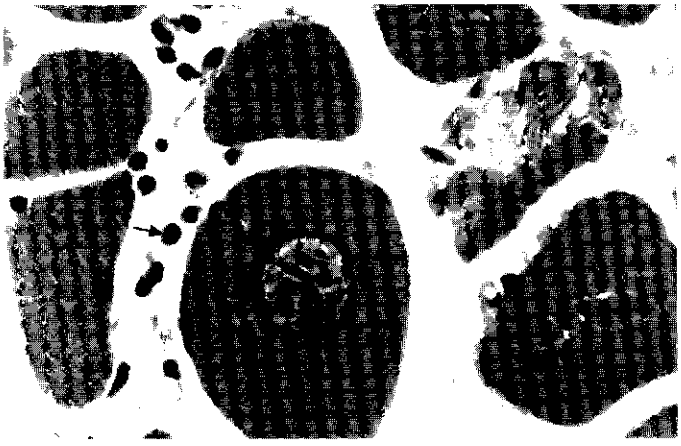

Fig. 2 – Transversal histological slide of equine muscular tissue. Mononuclear inflammatory cells (arrow) near to the cysts.

EDWARDS (1984), KIRMSE (1986) and LUZ PEREIRA *et alii* (1992) made similar findings, and also did not find any inflammatory reactions in their histological studies.

DUBEY & FAYER (1983) stated that the muscular inflammatory reaction in sarcocystosis usually appears after schizonts or second generation meronts rupture; and stops when the parasite forms a muscular cyst and matures. This may explain the lack of inflammatory reaction found in the present study.

Despite the few studies and reports dealing with equine sarcocystosis, it can be assumed that it spread throughout the national herd due the high prevalence rare (48.9%). The tongue was found to be the most affected tissue in this study without, however, any substantial damage to the muscular fibers.

SUMÁRIO

Freqüência de sarcocistos e alterações patológicas em tecido muscular foram estudadas em 237 eqüídeos, com idade acima de 2 anos, abatidos em matadouro-frigorífico no município de Apucarana, PR. Através de um processador de alimentos, os fragmentos musculares de língua e esôfago foram submetidos à trituração cujos resultados encontrados foram: 116 (48,9%) dos eqüídeos positivos, o que demonstra que a sarcocistose encontra-se disseminada no rebanho eqüino nacional. Os cortes histológicos revelaram a presença de sarcocistos, porém, não apresentaram reações inflamatórias ao seu redor ou nas proximidades destes cistos.

PALAVRAS-CHAVE: *Sarcocystis*, sarcocistos, cistos, tecido muscular, língua e esôfago, eqüídeos, eqüinos.

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