

Full Length Research Paper

Note on epizootic infection for the chronic upper respiratory diseases caused by *béta* – hemolytic *Streptococcus equi* observed on indigenous horses on Dakar's region in Sénégal

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The authors mentioned an epizootic infection for the chronic upper respiratory diseases caused by *béta* – haemolytic *Streptococcus equi* which have affected horses in two localities in Dakar and Rufisque areas (Dakar's region) in Senegal, during rainy season in 2009. These studies has been done according to clinical aspects and bacteriological and hematological analysis of the samples. The disease has been observed at the end of the rainy season and looks like an aigue form which can evolute near guerison or death. That is the first case observed and mentioned in Senegal.

Keys words: Bacteriology, chronic upper respiratory disease, dakar, dry season, hematology, infection, rainy season, Rufisque, *Streptococcus*, Senegal.

INTRODUCTION

The pathogen responsible for the horse strangles is *Streptococcus equi* subspecies *equi* Gram-positive, belonging to the family of *Streptococcaceae* and known from the thirteenth century in 1251 with the first descriptions by Jordann Ruffer (Timoney and Equine, 1999). The transmission of the disease was demonstrated in 1802 and the causative agent was described in Europe in 1888 (Taylor and Wilson, 2006; Slater, 2003).

First known as *S. equi*, the causative agent of strangles was later renamed *S. equi* subspecies *equi* in 1984 following the work of JAE Farrow and MD Collins (Euzeby and Guerin – Faublei, 2000; Jorm, 1993).

S. equi is a bacteria belonging to the Beta Hemolytic Lancefield Group C along with *S. equi* subspecies *zooepidemicus* and *S. equi* *desagalactiae* spp (Jorm, 1993). But unlike the last two, *S. equi* has never been implicated

in cases of human disease (Jorm, 1993).

This disease can be transmitted directly by oral or nasal or see through close contact with an individual with the excretory major risk of rapid spread of the disease in a number (Ames, 1995; Sweeney et al., 2005). Indirect transmission is possible through boots, overalls and all the materials that are not specific for single use (Jorm, 1993).

The reported outbreaks encountered in this disease are almost rare in Africa as against the disease reported in Europe (Taylor and Wilson, 2006; Slater, 2003). It was observed that the livestock were all removed in Canada where affected several horses, including four areas in the Lower St. Lawrence where it killed about 90% of equine livestock (Raizo, March 2009).

Strangles, or angina of horse, is a great and highly contagious infection of horses and other equines caused by a bacterium (*S. equi*). It is characterized by severe inflammation of the mucous membranes of the head and throat, accompanied by enlarged lymph nodes, which often burst and leak with abundance of thick yellowish

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pus (Jorm, 1991; Newton et al., 1997).

Strangles is caused by subspecies of the bacteria *S. equi* subspecies *equi* (*S. equi* (*S. equi*)), which is better known as Streptococcus of strangles (Habel, 1975; Timoney, 1993). This disease was first reported from the horses of the national Gendarmerie, which aims to ensure the presidential guard, a unit consisting solely of thoroughbred race horses most often imported from Morocco or Spain.

These outbreaks took place in three located areas two in Dakar and one in Rufisque. In Dakar's region, these kinds of infection, are rarely observed in horses: clinical cases reported in Senegal, are rare in the past.

However, this year an acute cases of this disease have been detected in Dakar's region (Medina and Rufisque gendarmeries zones): this is what we report in this note.

METHODOLOGY

Epizootiological situations

Dakar's area

Fifty subjects were assigned in a total of 115 who succeeded for two to three weeks. Two horses succumbed in Dakar which has a special microclimate, especially for its moderate temperatures and relative humidity fairly high, with an annual rainfall of 400 mm a satisfactory condition which enjoy livestock. It is within this context that occur epidemiological cases of suspected strangles with three deaths recorded in Dakar and Rufisque area's. These horses are kept in conditions which meet as closely as possible to the requirements for modern farming. They have taken thus an acaricide bath once or twice a week, according to the seasonal abundance of mite populations. At the post winter, it was assumed that there has been an interruption of these acaricides baths and horses became ill with the symptoms described above at the end of the rainy season in November 2009, at the beginning of the cold season.

Rufisque's area

This place is situated in the suburbs of Dakar and enjoys a special microclimate similar to that in Dakar.

These horses are also the subject of a good treatment, thus meeting the requirements of a modern type of farming. The outbreak occurred at the same post with three winter cases were emerging, which continued for at least a period of two or three weeks. A horse died there.

Symptoms and damage

The two epizootiological situations correspond to two different clinical courses. As a result of the treatment undertaken, penicillin, streptomycin and anti inflammatory were routinely performed on sick animals from the farm of Medina gendarmerie, in which we observed the following symptoms: cough, nasal muco - purulent, and hyperthermia (39 at 40°C), where two horses died and the autopsy revealed a ruptured rectum following a colon, and hemorrhagic lesions in the intestines and lungs. For animals kept at Rufisque area, the clinical picture is this: They show the usual signs of a generalized infectious process (depression, lack of appetite and fever 39 to 39.5°C). More importantly, they present the most

characteristic signs of strangles which are nasal discharge (runny nose or catarrh, mucous first, then very quickly lumpy and purulent).

Laboratory diagnosis

During these outbreaks on the farm of Medina and Rufisque's areas, strangles of the horse was detected by the following blood tests (10 ml heparinized blood) and nasal swabs of animals with hyperthermia as nine and three for Medina and Rufisque respectively. The various blood samples related Medina's horses who is the subject of the study of hematological parameters such as cell counts of white blood cell (WBC) and red blood cells differential count and hematocrit value for 100).

Blood count was obtained by the use of Malassez and THOMA cells. The WBC was performed by blood smears stained with the RAL 555 and rapid Giemsa methods, and was then observed under a microscope by establishing the percentage of different white elements in comparison with normal values according to Schalm veterinary haematology (Schalm, 2000). The hematocrit value was determined by using hematocrit capillary tubes after centrifugation at 2500 rpm for 5 min.

Blood samples and nasal swabs were used to study the bacteriological characters by usual classical methods by culturing, isolation and identification of the suspected organism of this infection in this case *S. equi*.

RESULTS AND DISCUSSION

Hematology

Examination of the haematological parameters, such as blood count and hematocrit value to 100, are shown in Table 1. The results of the review of the WBC are shown in Table 2. These results show that the hematocrit value appears to be lower (anemia). However, the WBC translated an abundance of neutrophils and decreased lymphocytes.

These values obtained confirm the observations made by Sisson and Grossman (1953) on the fact that this infection occurs mainly by hyperthermia, which can reach 40°C and the usual clinical manifestations, pronounced anemia (NFS), cough and the nasal muco purulent.

The blood count is seen as a characteristic of an inflammatory condition (leukocytosis, neutrophilia) associated with an anemia iron deficiency (microcytic hypochromic anemia) due to a consumption of the host defense by bacteria or by a non-specific mechanism, corroborating the observations of Taylor and Wilson (2006) on the impact of hematologic parameters on horse strangles.

Bacteriology

The diagnosis can be confirmed by culturing pus from the nose, lymph nodes or abscessed throat horses showing clinical signs. Although they are considered genetically identical isolates of Streptococcus of strangles can vary in terms of their virulence and there are atypical isolates

Table 1. Study of haematological parameters (red blood cell count and hematocrit) in horses of the gendarmery.

parameters	Normal average according to schalm	Horse1	Horse2	Horse3	Horse4	Horse5	Horse6
Number of red blood cells per μl	$12 \cdot 10^6$	9.0	8.3	9.2	8.5	8.7	9.1
Hematocrit per cent	35.0	25.0	27.0	26.0	25.0	24.0	27.0

Table 2. Study of haematological parameters (WBC count and WBC) in horses of the Medina gendarmery.

Parameters	Normal average according to schalm	Horse 1	Horse 2	Horse 3	Horse 4	Horse 5	Horse 6
WBC number per μl	810^3	$7.5 \cdot 10^3$	$7.2 \cdot 10^3$	$7.0 \cdot 10^3$	$7.0 \cdot 10^3$	$7.1 \cdot 10^3$	$7.4 \cdot 10^3$
Neutrophils per cent	30	45.0	43.0	44.0	43.0	43.0	44.0
Lymphocytes per cent	62	50.0	51.0	50.0	49.0	50.0	49.0
Monocytes per cent	2.5	2.0	2.4	2.5	2.5	2.5	2.5
Eosinophils per cent	5.0	2.5	2.4	3.0	5.0	4.5	4.1
Basophils per cent	0.5	0.5	0.4	0.5	0.5	0.5	0.4

that do not react the same way as the *S. equi* typical tests for sugars fermentation.

During these outbreaks, the diagnosis of this infection was confirmed by culturing blood, pus in the nose, lymph nodes following the study of morphological characters (= Streptococcus positive Gram and chains of cocci), cultural and biochemical (catalase which is negative and lack of hydrolysis of certain sugars such as lactose, trehalose and sorbitol). These results confirm also the presence of Streptococcus equi (Minor, 1989).

In general, the results obtained in this study confirms the current knowledge available in the literature on horse strangles developed by bibliographic references: it is noted that the animals that are mostly affected were usually older (over 6 months), which is surprising as we observe that strangles is known as a disease of young non-immunized individuals (Sweeney et al., 1989).

Conclusion

Strangles was a rare disease and is considered far from Sudano Sahelian Africa, as a non-pathogenic infection, however in Africa, large areas of infected livestock (Timoney and Equine, 1999).

The introduction of new breeds of animals was sometimes the occasion of the manifestation of this infection which can take a serious look, unlike the native animals, where cases of strangles, were almost never been reported.

If clinical and epidemiological aspects of strangles are well known in the scientific community, shortcomings concerning the pathogenicity of *S. equi* subspecies *equi* and the response it induces in the host remain.

Few vaccines whose effectiveness remains to be demonstrate dare: the fight against strangles relies primarily on the implementation of health control measures relating to a mastery of the

disease. The use of this data seems very interesting and we hope this will stimulate interest for veterinary research (Waller et al., 2007).

Currently, it is thus necessary to provide some prevention to this infection that can cause enormous economic losses in west African countries like Senegal.

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