

## Diagnosis of Atrial Fibrillation in A Horse in Association with Microfilariasis

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### Abstract

A 12-year-old crossbred mare was presented to the clinic with a history of frequent reduction in the working capacity. Clinical examination revealed congested mucus membranes, elevated respiratory rate and arrhythmia. Laboratory analysis revealed the anemia, lowered packed cell volume, lowered albumin, total protein, sodium and potassium levels. Electrocardiography confirmed the presence of the atrial fibrillation and wet blood film examination showed the presence of the motile microfilaria organisms. The horse was treated with oral administration of quinidine sulfate and other supportive therapy.

**Keywords:** Horse; Atrial fibrillation; Microfilaria; Quinidine sulfate; Ivermectin

### Introduction

Atrial fibrillation (AF) is one of the common performances limiting arrhythmia in the horses. It results from the different predisposing, associated and underlying factors. Clinical manifestations of the atrial fibrillation may from animal to animal and mainly it depends on the primary and secondary disease [1]. Horses are more prone to development of the atrial fibrillation due to the presence of the large atria and high vagal input. Electrocardiography is the best diagnostic tool for the diagnosis cardiac arrhythmias in large animals [2]. Microfilariasis is one of the common parasitic infections in horses and it can occur invariably of domestic animals all over the world. All filarioid nematodes produce larvae in the skin or blood circulation. Based on the location of the adult and microfilaria organism's exhibition of clinical signs varies from the host to host [3]. The present manuscript records the diagnosis of atrial fibrillation in association with the microfilariasis in a horse.

### Case History and Observations

A 12-year-old crossbred mare was presented to the Teaching Veterinary Clinical Complex, College of Veterinary Science, Proddatur with the history of frequent reduction in work performance. Clinical examination revealed, rectal temperature (102.8°F), arrhythmia with a heart rate of 48/min, increased respiratory rate (28/min), congested mucus membranes, palpable lymph nodes, rough hair and laminitis (Figure 1). Cardiac auscultation revealed irregular heart rhythm and variable intensity of heart sounds with the occasional long pause of few seconds.

Electrocardiography was according to the previous studies by the base apex lead system [4]. It revealed the presence of the arrhythmia and atrial fibrillation (Figure 2). Wet blood film examination revealed the presence of the motile microfilarial organisms of *Setaria* spp. (Figure 3). Haemato biochemical analysis revealed the haemoglobin 7.12 g/dL, PCV 19%, RBC  $4.06 \times 10^6/\mu\text{L}$ , WBC 12,620/ cumm, total protein 5.16 g/dL, albumin 2.6 g/dL, BUN 52.7 mg/dL, creatinine 1.86 mg/dL, AST 253.6 U/L, creatine kinase 312 units/L, sodium 108.1 mEq/L, potassium 2.12 mEq/L and calcium 14.26 mg/dL. The case was diagnosed as atrial fibrillation associated with the microfilariasis.

### Treatment and Discussion

The horse was treated with intravenous administration of inj amoxicillin and cloxacillin (10 mg/kg body weight), inj flunixin (1 mg/kg body weight), inj frusemide (2 mg/kg body weight) along

with 5% DNS (10 ml/kg body weight) for four days. Three doses of inj ivermectin (at 200 µg/kg body weight, SC) were given at one week period interval. By the fourth day, horse was active, but the persistence of irregular arrhythmia was noticed upon auscultation. After two weeks, auscultation of the heart revealed the presence of atrial fibrillation. Based on the presence of the fibrillation it considers as persistence atrial fibrillation and treated with three doses of oral quinidine sulphate (22 mg/kg body weight, at four-hour interval). Improvement in the condition was assessed by the auscultation of heart and it was sinus rhythm. Following therapy horse has uneventful recovered and free from fibrillation after the completion of last dose. Recurrence of the atrial fibrillation was not noticed even after the four months period of observation.



**Figure 1:** Congested mucus membranes.

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**Figure 2:** Atrial fibrillation (10 mm/mV and 25 mm/sec).



**Figure 3:** Presence of Microfilaria in wet blood film examination (100X).

In the present study, the presumptive diagnosis was made based on cardiac auscultation. The heart rhythm is irregularly irregular, typically with a few more rapid beats interspersed with longer pauses of variable length and it was confirmed by the electrocardiography. Two different categories of atrial fibrillations were recorded in a horse. “Lone atrial fibrillation” is the common one and it is due to the presence of AF without evidence of underlying heart disease. The second category is “secondary atrial fibrillation,” there is evidence of heart disease. Based on the abnormal electrolyte findings, the presence of microfilaria infection, heart rate below the 60 bpm and response to the quinidine: this case is diagnosed as horse suffering with “lone atrial fibrillation” [5].

Previously, successful management of secondary atrial fibrillation was achieved by administration of the quinidine sulfate [6]. The drug recommended at 20-22 mg/kg body weight for every 2 hours until the normal sinus rhythm. Most of the horses will attain the normal sinus rhythm after completion of the 30 to 60 gram of quinidine [7]. In the present case, low level of potassium and sodium might be one of the cause for cardiac arrhythmias it may due to the reduction in renal function [8]. The observed abnormal sero-biochemical changes were

may be due to microfilariosis. Observed hematological parameters showed relatively decrease in the level of hemoglobin and packed cell volume it might be due to the rapid disintegration of erythrocytes causing hemolysis.

## Conclusion

The present case was treated with ivermectin and it is effective on adults and microfilaria of *S. equina* in horses [9]. Present case reports about the diagnosis of atrial fibrillation and its successful management in a horse.

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