



FIRST REPORT OF *SETARIA EQUINA* MICROFILARIAE INFECTION IN AN ADULT ARGENTINE POLO PONY MARE IN NIGERIA: A CASE REPORT

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ABSTRACT

Setaria equina is a common parasitic infection in horses that is transmitted by mosquitoes. The absence of previous reports regarding the presence of *Setaria equina* microfilariae in Nigerian horses highlights the need to confirm its existence in the region. Verifying the existence of this parasite would enhance our overall understanding of its global distribution, which could then inform the development of more effective control measures. This paper reports a case of *Setaria equina* microfilariae infection in an adult Argentine polo pony mare in Nigeria. The recently acquired adult Argentine polo pony mare was exhibiting depression and weight loss. Despite normal vital parameters, the horse had a poor body condition and no history of deworming. Laboratory analyses, including wet blood film examination, complete blood count, and serum biochemistry, revealed the presence of *Setaria equina* microfilariae and macrocytic hypochromic anaemia. Treatment involved a five-day course of intramuscular multivitamin injections and three weeks of subcutaneous ivermectin injections. Follow-up examinations demonstrated the absence of microfilaria and a return to an active and lively state. The case report details the clinical presentation, diagnostic process, and successful treatment

of a recently acquired adult Argentine polo pony mare. A consistent deworming regimen is essential for horses, including those recently acquired, to prevent parasitic infections and enhance their overall well-being.

Key words: Argentine polo pony mare; ivermectin; microfilaria; *Setaria equina*

INTRODUCTION

Setaria equina is a pathogen that is spread widely through vectors and primarily affects horses, especially in tropical climates. Typically, Aedes or Culex mosquitoes are the potential carriers of this pathogen [1]. Horses get infected when a mosquito feeds on their blood, and the pathogen takes eight to ten months to complete its life cycle [13]. Additionally, prenatal transmission is identified as a mode of *Setaria* species transmission [5, 10]. Adult *Setaria equina* worms vary in size from 5 to 13 cm, with males being smaller and predominantly located in the equine peritoneal cavity [8, 19]. While non-pathogenic, these worms may induce varying degrees of peritonitis and may migrate to equine eyes, brain, lungs, and scrotum, leading to symptoms such as lacrimation, paraplegia, blindness, locomotor, and neurological disturbances [16, 17].

The management of *Setaria equina* infection entails a combination of surgical and medical approaches. The surgical extraction of the parasite from the eye, performed using techniques like paracentesis or aspiration, is a commonly used treatment approach [6, 11]. Ivermectin is the most frequently suggested medication for treating ocular equine setariasis; however, it is important to exercise caution against extended use of medication, and surgical options should be contemplated as an alternative [15]. In the realm of medical treatment, the combination of ivermectin and fenbendazole has demonstrated effectiveness in eliminating microfilaremia [10].

The case of *Setaria equina* microfilariae infection in horses has never been reported in Nigeria, to the best of the authors' knowledge. The confirmation of its existence in Nigeria helps broaden the global comprehension of the geographical spread of this parasite and assists in creating all-encompassing plans for its management and prevention. Consequently, we present a case of *Setaria equina* microfilariae infection in a mature Argentine polo pony mare residing in Nigeria.

History, clinical examination, and sample collection

A recently purchased adult Argentine polo pony mare, weighing 550 kg, was presented with a history of depression and weight loss. The patient had no history of deworming. Upon clinical examination, all vital parameters, including heart rate (44 beats.min⁻¹), respiratory rate (20 breaths.min⁻¹), and rectal temperature (38.3 °C), were within the normal range, as reported by O l a o g u n et al. [12]. However, it was observed that the patient had a poor body condition (body condition score of 3 out of 9) according to A k i n i y i et al. [2]. A 10 ml jugular venous blood sample was obtained using a 10 ml syringe and 19G needle by slow suction. The sample was divided into EDTA bottles (5 ml) for haematological analysis and wet mount, and plain bottles (5 ml) for serum chemistry analysis. Within 30 minutes, the samples were transported in an ice chest to the Clinical Pathology Laboratory, Department of Veterinary Pathology, University of Ibadan.

Laboratory analysis

Wet blood film examination was conducted by placing a droplet of blood on a clean microscope slide and covering it with a cover slip (22 × 22 mm). The blood was examined microscopically at a total magnification of 400×, covering approximately 50–100 fields per slide.

The haematological indices of the samples were analysed using standard methods. The packed cell volume (PCV) was determined by the microhaematocrit method [19]. The haemoglobin concentration (Hb) was determined using the cyanomethaemoglobin method [3]. The red blood cell (RBC) and white blood cell counts were determined manually using a Neubauer haemocytometer. The differentiation of white cells into segmented neutrophils, lymphocytes, eosinophils, and monocytes was carried out by microscopic examination of Giemsa-stained thin blood smears. The platelet count was determined following the Rees and Ecker direct counting method as adopted by I h e d i o h a and A g i n a [4].

Blood samples were subjected to centrifugation at 1008 g (3,000 revolutions per minute) for 10 minutes using a table centrifuge (TDL4®, B. Bran Scientific and Instruments Co., England) to isolate the serum. The blood serum was then analysed for various parameters, including total protein (TP) and its fractions (albumin and globulin), aspartate aminotransferase (AST), blood urea nitrogen (BUN), and creatinine. These analyses were conducted through spectrophotometry using RANDOX® laboratory reagent kits sourced from RANDOX Laboratories Ltd., Ardmore, United Kingdom, following the manufacturer's instructions.

Laboratory findings

A long, worm-like organism (microfilaria) was observed in the background of the wet blood film. The microfilaria appeared as a sheathed worm, with its body enveloped in a membrane called a sheath. Based on these characteristics, the microfilaria was identified as *Setaria equina* microfilariae (Fig. 1). The leucogram only revealed low haemoglobin, low packed cell volume, low red blood cell count, and macrocytic hypochromic anaemia (Table 1). All serum biochemistry parameters were within the normal range (Table 2).

Treatment and outcome

Multivitamin injection (Introvit®, Interchemie Werken 'De Adelaar' B.V., Netherlands) was administered intramuscularly at 15 ml per horse for five days. Ivermectin injection (Intermectin®, Interchemie Werken 'De Adelaar' B.V., Netherlands) was administered subcutaneously at 1 ml per 50 kg once every week for 3 weeks. A wet mount was performed a week after the completion of treatment,

Table 1. Haematology results

Blood parameters	Value	Reference value [14]	Inference
Haemoglobin (g. dl ⁻¹)	8.0	11–19	Low Hb
Packed cell volume (%)	29	32–53	Low PCV
Reb blood cell (X 10 ⁶ .µl ⁻¹)	4.27	6.6–12.9	Low RBC
Mean corpuscular volume (fl)	67.9	37–59	Macrocytic anaemia
Mean corpuscular haemoglobin concentration (g. dl ⁻¹)	27.6	31–38.6	Hypochromic anaemia
Platelets (µl)	200000	100000–600000	Normal
Total white blood cell count (x 10 ³ .µl ⁻¹)	5500	5400–14300	Normal
Seg. neutrophils (x 10 ³ .µl ⁻¹)	3380	2300–8500	Normal
Band neutrophils (x 10 ³ .µl ⁻¹)	40	0–100	Normal
Lymphocytes (x 10 ³ .µl ⁻¹)	2000	1500–7700	Normal
Monocytes (x 10 ³ .µl ⁻¹)	0	0–1000	Normal
Eosinophils (x 10 ³ .µl ⁻¹)	80	0–1000	Normal
Basophils (x 10 ³ .µl ⁻¹)	0	0	Normal

and no microfilaria were found. Additionally, the patient was observed to be active and lively.

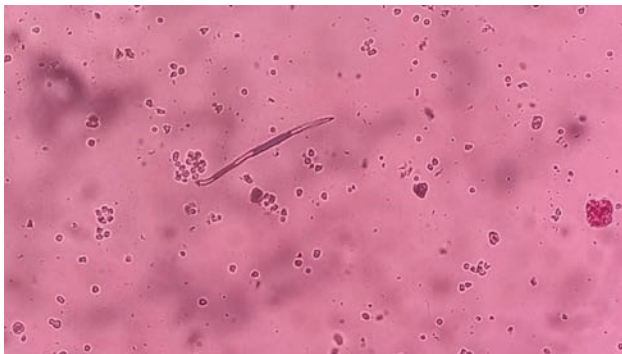


Fig. 1. *Setaria equina* microfilaria with the body enveloped in a transparent sheath (indicated by arrows)

Table 2. Serum biochemistry results

Serum parameter	Value	Reference value [14]	Inference
Total protein (g.dl ⁻¹)	6.9	6–7.7	Normal
Albumin (g.dl ⁻¹)	3	2.9–3.8	Normal
Globulin (g.dl ⁻¹)	3.9	3.1–3.9	Normal
Aspartate transferase (µl)	300	220–600	Normal
Blood urea nitrogen (mg. dl ⁻¹)	18	10–24	Normal
Creatinine (mg. dl ⁻¹)	1.3	0.0–1.9	Normal

DISCUSSION

This paper reports on the diagnosis and successful management of a case involving *Setaria equina* microfilariae infection in an adult Argentine polo pony mare in Ni-

geria. The recently acquired horse, displaying depression and weight loss despite normal clinical vital parameters and poor body condition, had a blood sample collected for wet blood film examination, complete blood count (CBC), and serum biochemistry. The case revealed *Setaria equina* microfilariae in the wet blood film, which were successfully treated with ivermectin. The treatment involved intramuscular multivitamin administration and subcutaneous ivermectin, resulting in microfilariae elimination and improved horse activity.

The horse was recently acquired, and given the prepatency period of *S. equina* being 8 to 10 months [13, 20], it is likely that the horse in this instance was infected before the purchase. The horse's clinical parameters all fell within the normal range, aligning with the findings of Kumar et al. [7] in a similar case. The identification of *S. equina* microfilaria through a wet blood film examination in this current case is also documented in the study by Kumar et al. [7]. The *S. equina* microfilaria observed in this case is encased in a membrane known as a sheath. This sets it apart from equine onchocerciasis (*Onchocerca cervicalis* microfilaria), as the latter lacks such a sheath [9]. *Setaria equina* microfilariae have been observed in equine peripheral blood mononuclear cells, indicating their presence in the horse's system [13]. However, the adult worms are typically found in the peritoneal cavity [13]. This suggests that the microfilariae may be more easily detected in the blood, while the adults are located elsewhere in the body.

The decreased haemoglobin, low packed cell volume, reduced red blood cell count, and macrocytic hypochromic

anaemia observed in this case were also documented in the study by Suleiman et al. [18]. Investigations into *Setaria equina* microfilaria infection in horses have revealed that the presence of these microfilariae does not have a substantial impact on serum parameters [13], which was consistent with the findings in the current case. The horse's deworming history was uncertain, making it improbable that it had received treatment with an avermectin-based anthelmintic in the previous 8 months. The ivermectin administered in this case has been demonstrated to be highly effective against *S. equina* microfilaria [10].

The case heavily relies on the wet blood film examination for the diagnosis of *Setaria equina* microfilariae, and the specificity and sensitivity of this method may vary. Hence, a thin blood smear would have provided a clearer picture. Also, the presence of the adult *Setaria equina* was not established in this case.

In conclusion, this case report outlines the clinical manifestations, diagnostic methods, and effective treatment of an adult Argentine polo pony mare, recently purchased, that exhibited depression and weight loss and was ultimately diagnosed with *Setaria equina* microfilariae via wet blood film examination. The thorough treatment plan, which included multivitamin and ivermectin injections, led to the disappearance of clinical signs and the absence of microfilaria in the ensuing follow-up. It is crucial to implement routine deworming protocols for horses, including those newly acquired, to prevent parasitic infections and enhance their overall well-being.

Competing Interests

The authors have no relevant financial or non-financial interests to disclose.

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