Journal of Sustainable Veterinary & Allied Sciences
P-ISSN-2695-2661 e-ISSN: 2811-1346
JoSVAS 2026 March Vol. 8 Issue 1: 81-85

Case Report

SCREENING FOR TRYPANOSOMIASIS IN NEWLY ACQUIRED INDIGENOUS (AREWA) HORSES IN A NIGERIAN MILITARY STABLE

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ABSTRACT

Trypanosomiasis remains a significant constraint to equine health and productivity in sub-Saharan Africa. Infected animals, if introduced into a stable, may act as reservoirs for vectors, posing risks of transmission. Quarantine and screening of horses for trypanosomiasis before integration into a stable is a critical biosecurity measure, prompt treatment and vector control to reduce transmission risks in endemic areas. This study investigated the occurrence of trypanosomiasis in 22 newly acquired indigenous (Arewa) breed of horses in a military stable, Kaduna State, Nigeria using thin blood smear microscopy. Three horses (13.6%) tested positive for *Trypanosoma evansi* consistent with reports of *Trypanosoma* spp. within the region. Positive horses were treated with isometamidium chloride (0.5mg/kg IM, repeated after 72 hours) and Vitamin B-complex (10 ml IM for 5 days). The study highlights the importance of targeted surveillance.

Keywords: Indigenous (Arewa) horses, Trypanosomiasis, Quarantine

INTRODUCTION

Trypanosomiasis is a protozoan disease of significant economic and health importance in horses, especially in tsetse-infested areas of Nigeria (Agina *et al.*, 2021; Sabiu *et al.*, 2024). Equine trypanosomiasis caused by species of the genus *Trypanosoma*, is a complex of infectious diseases called dourine, nagana or surra mainly by *Trypanosoma equiperdum, Trypanosoma evansi, T. vivax.* Occasionally, *T. congolense* and *T. brucei* (Vourchakbe *et al.*, 2020). *Trypanosoma equiperdum* causes dourine which is sexually transmitted (Yonas *et al.*, 2021). *Trypanosoma evansi* causes Surra transmitted by biting flies such as *Tabanus* and *Stomoxys*. *T vivax, T congolense and T brucei* cause animal trypanosomiasis (nagana) transmitted by tsetse flies and other biting flies. *Trypanosoma congolense* primarily infects cattle but can infect equids in tsetse infested areas (Rodrigues *et al.*, 2005; Büscher *et al.*, 2019).

Trypanosoma evansi, T. vivax and *T. congolense* have been reported in horses around Kaduna and other tsetse-infested regions of Nigeria (Ehizibolo *et al.*, 2012; Agina *et al.*, 2021).

The indigenous (Arewa) breed of horse, popular in northern Nigeria is used for ceremonial, military and recreational purposes. It is highly susceptible to trypanosomiasis, which can impair performance and lead to economic losses (Useh *et al*., 2005). Clinical signs of Equine Trypanosomiasis include lethargy, intermittent fever, anaemia, keratitis, conjunctivitis, emaciation, urticaria, oedema especially in the distal limbs, ventral abdomen, scrotum and fetlocks. Nervous signs like paralysis, in-coordination, circling movements, teeth grinding and death may be seen in advanced stages and severe infection. Reproductive problems such as abortion and reduced milk yield in mares have been reported (Desquesnes *et al.*, 2013; Silva *et al.*, 2013). Diagnosis of trypanosomiasis relies on detecting the parasite or its genetic/antigenic markers. Light microscopy examination of Giemsa-stained thin blood smears is simple, cheap, rapid and confirmatory.

Molecular techniques such as polymerase chain reaction (PCR) provide increased sensitivity and specificity which detects the parasite even when it is present in low quantity (Njiru*et al.*, 2005; Ngomtcho *et al.*, 2017; Mostafa *et al.*, 2024). Immunological techniques like immunofluorescene, Latex agglutination tests and Enzyme-Linked Immunosorbent Assay (ELISA) are widely used for

http://doi.org/10.54328/covm.josvas.2026.329

serological surveys of trypanosomiasis (Gillingwater *et al.*, 2010).

In livestock, infections with *T. evansi, T. vivax,* and *T. congolense* result to major losses in meat, milk, and draught power, which in turn impact food security and rural livelihoods (Desquesnes *et al.*, 2013; Giordani *et al.*, 2016). Although classically considered an animal disease, rare human cases of *T. evansi* infection have been documented in India, demonstrating zoonotic potential (Joshi *et al.*, 2005).

In addition, *T. brucei gambiense* and *T. brucei rhodesiense* cause Human African Trypanosomiasis (HAT, "sleeping sickness"), with domestic and wild animals acting as reservoirs, emphasizing the cross-species transmission risk (Franco *et al.*, 2018). Transmission is mediated by vectors such as tsetse flies (*Glossina* spp.) and mechanically by biting flies (*Tabanus, Stomoxys*), linking disease control to environmental management and vector ecology (Connor & Van den Bossche, 2004). Screening newly acquired or returning horses before integration into a stable is vital to prevent the introduction of *Trypanosoma* spp. as a single infected horse can spread the disease within a herd. Screening acts as the first line of defence against stable infection and economic loss (Büscher *et al.*, 2019; WOAH, 2023).

This report is an outcome of the screening of 22 newly acquired indigenous (Arewa) breed of horses for *Trypanosoma* spp. before their integration into a military stable in Kaduna State, Nigeria.

MATERIALS AND METHODS

STUDY ANIMALS

The screening was conducted on twenty- two (22) indigenous (Arewa) breed of horses (mixed varied ages: both sexes) recently purchased by a vendor from Ilela livestock market, Sokoto State, Nigeria. Upon arrival, all the horses were quarantined for 30 days as recommended by the WOAH (OIE) guidelines (WOAH, 2023).

SAMPLE COLLECTION AND LABORATORY EXAMINATION

A total of 5 ml of blood was collected aseptically from the jugular vein into ethylene diamine tetraacetic acid (EDTA) tubes following proper restraint of each horse. The tubes were labelled and carefully packed. Thin blood smears were prepared on glass slide, air dried, fixed in methanol for 3-5min and stained in 5% Giemsa stain for 30-45 min in a staining jar and rinsed in buffered distilled water. (Kamani *et al.*, 2010; Desquesnes *et al.*, 2022).The slides were examined under a light microscope (Magnus MLX Plus, India) using a x100 oil immersion objective lens.

RESULTS

Out of the 22 horses tested, 3 (13.6%) were positive for *Trypanosoma evansi.* The parasites displayed the characteristic elongated, slender, flagellated morphology with undulating membrane seen extracellularly. Positive horses showed clinical signs such as reduced appetite, lethargy and intermittent fever in one of the horses.

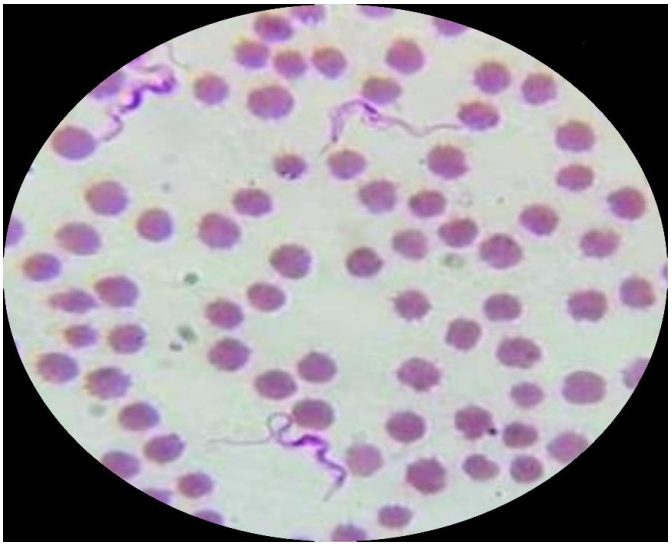

Figure I: Giemsa-stained thin blood smear showing *Trypanosoma evansi* trypomastigotes x 100

All three positive horses were treated with isometamidium chloride at 0.5mg/kg body weight deep intramuscular (IM) administered once, with a second dose administered 72 hours later. Additionally, they received vitamin B -complex at 10 ml IM for 5 days to support recovery and appetite.

TREATMENT OUTCOME

Combined therapy with isometamidium chloride and vitamin B-complex was effective; all three horses showed marked clinical improvement and parasitemia resolved with no relapse recorded.

DISCUSSION

Trypanosoma evansi is a unicellular hemoflagellate protozoan transmitted primarily through mechanical inoculation by hematophagous flies, particularly species of *Tabanus* and *Stomoxys.* Morphologically, *T. evansi* is monomorphic, long, slender trypomastigotes in the bloodstream, characterized by an elongated body, a centrally located nucleus, a subterminal or terminal kinetoplast, a prominent undulating membrane and a free anterior flagellum. In the mammalian host, *T. evansi* multiplies by longitudinal binary fission in the blood and tissue fluids, causing a range of clinical manifestations including intermittent fever, progressive anaemia, oedema, weight loss, and neurological disturbances. Incubation period for *Trypanosoma* spp. is typically 1–4 weeks, so keeping horses

quarantined for at least three weeks allows time for early signs or laboratory results availability (Büscher *et al.*, 2019; Desquesnes *et al.*, 2022).

The 13.6% prevalence observed aligns with recent Nigerian and regional equine trypanosomiasis data (Ehizibolo *et al.*, 2012; Vourchakbé *et al.*, 2020; Sabiu *et al.*, 2024). The detection of *Trypanosoma evansi* in newly acquired indigenous (Arewa) horses in a military stable in Kaduna highlights the importance of targeted surveillance. Infected horses may remain asymptomatic for extended periods, serving as hidden reservoirs of infection. Such sub-clinical carriers can transmit the parasite posing a significant epidemiological risk. Routine diagnostic testing before integration helps identify and isolate these silent carriers (Desquesnes *et al.*, 2022).

Early diagnosis, prompt treatment, and supportive therapy are critical, especially given reports of emerging drug resistance (Pereira *et al.*, 2024; Ungogo *et al.*, 2024). Isometamidium chloride is a phenanthridinium trypanocidal compound used for both treatment and prophylaxis of animal trypanosomiasis. Following intramuscular administration, it is absorbed slowly and exhibits extensive tissue binding, particularly in muscle, liver, and spleen, resulting in prolonged persistence and sustained prophylactic activity, while elimination occurs mainly via the bile and faeces. Its trypanocidal action is mediated through binding and intercalation into kinetoplast DNA, leading to disruption of mitochondrial function, inhibition of kinetoplast DNA replication and transcription, and eventual parasite death.

Isometamidium chloride remains an effective chemotherapeutic agent for equine trypanosomiasis, clearing parasitemia and improving haematological parameters such as haemoglobin and erythrocyte count within days of treatment (Bhardwaj *et al.*, 2024). Adverse reactions to isometametamidium chloride are typically localized, including injection-site swelling and mild muscle irritation, but high doses may cause systemic reactions such as diarrhoea, hepatotoxicity and nephrotoxicity. Adherence to recommended dosing protocols is necessary for effective treatment (FAO, 2018).

Vitamin B- complex consists of eight water-soluble vitamins (B_1, B_2, B_3, B_5, B_6, B_7, B_9 and B_{12}) that function as essential coenzymes in cellular metabolism, neurotransmitter synthesis, hematopoiesis and nucleic acid production (Calderon-Ospina *et al.*, 2020). Adjunctive therapy with vitamin B-complex supports erythropoiesis, energy metabolism and overall recovery, providing a biochemical rationale for combined therapy (Mimenza-Alvarado & Aguilar-Navarro, 2016). International and national animal health authorities, including the World Organisation for Animal Health (WOAH), require testing and certification of horses for *Trypanosoma* spp. Screening ensures compliance with these standards and facilitates safe animal trade and competition entry (WOAH, 2023).

CONCLUSION AND RECOMMENDATIONS

Screening horses for trypanosomiasis before integration into a stable is a critical bio-security measure that protects equine health, prevents outbreaks and reduces economic loss. Combining modern diagnostics with proper quarantine and vector control provides the most effective prevention strategy. Positive animals should be isolated, treated promptly with isometamidium chloride 0.5mg/kg IM, repeated after 72 hours, and given vitamin B-complex 10ml IM X 5/7. Stable management should include regular vector control to prevent spread (Murrina, 2004; Pereira *et al.*, 2024). Future researches should focus on surveillance combining serology and molecular analysis for monitoring and screening so as to ensure better control strategies that safeguard equine health and reduce risk of zoonotic trypanosomes.

ACKNOWLEDGEMENTS

The authors sincerely appreciate the stable attendants for their support and the technical assistance of the staff of the veterinary clinic and laboratory, Equitation Wing, Nigerian Defence Academy, Kaduna, Nigeria.

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