An outbreak of bovine trypanosomiasis in the Blue Nile State, Sudan

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Abstract

Background: In this paper, we report an outbreak of bovine trypanosomiasis in Kurmuk District, Blue Nile State, Sudan that involved an infection with four Trypanosoma species in cattle. The outbreak occurred in June 2010 when indigenous cattle, mainly Kenana and Fulani breed types, crossed the national Sudanese border to Ethiopia and returned. A veterinarian was notified of massive deaths in the cattle populations that recently came from Ethiopia. All animals involved in the outbreak were from the nomadic Fulani group and resident local cattle were not infected and no death has been reported among them. A total of 210 blood samples were collected from the ear vein of cattle. A few samples were also collected from other domestic animals species. Parasitological examinations including hematocrit centrifugation techniques (HCT) and Giemsa-stained thin blood films were carried out. ITS1-PCR, which provides a multi-species-specific diagnosis in a single PCR, was performed. Findings: Parasitological examinations revealed that 43% (91/210) of the affected cattle population was infected with two morphologically distinct trypanosomes. Seventy animals (33.3%) were infected with T. vivax and twenty one (10%) with T. congolense . In contrast, ITS1-PCR was able to identify four Trypanosoma species namely T. vivax, T. congolense, T. simiae and T. brucei in 56.7% (80/141). T. brucei showed the highest prevalence of 36.9% (52/141) and the lowest 19% (27/141) was displayed by T. congolense . Furthermore, and because ITS1-PCR could not differentiate between T. brucei subspecies, serum resistance-associated (SRA) gene based PCR was used to detect the human T. brucei rhodesiense in T. brucei positive samples. None of the samples was shown positive for T. b. rhodesiense . The identity of the 400 bp PCR product originating from T. simiae , was further confirmed by sequencing and subsequent phylogenetic analysis. Conclusions: The outbreak of bovine trypanosomiasis occurred in the Blue Nile State was caused by mixed infection of two or more Trypanosoma species and the conventional parasitological examinations were not reliable in identifying all the species of Trypanosoma involved in the outbreak. It is difficult to determine the cause of the disease for the reason that the current enzootic situation in the resident cattle in the region is poorly understood. The study concluded that there are at least four species of trypanosomes that caused this outbreak in the Blue Nile State. The presence of mixed infections might have exacerbated the severity of the disease. It is hypothesized that variant parasite type(s) might have been introduced to Sudanese cattle when they crossed to Ethiopia, a tsetse belt region.