

Is *Rhipicephalus microplus* of Interest in Human Health in Panama?

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Opinion

Tick-Borne Diseases (TBD) comprise a complex of diseases caused for several species of virus, rickettsial, bacteria or protozoans [1]. Some countries considered TBD among the principal pathologies in humans and animals; however, in most countries are neglected diseases, or are not included in the differential diagnosis [2]. In these countries, factors such as the lack of epidemiological information, confusion of symptoms with other vectorial diseases, and/or low clinical suspicion, are among the main problems to the diagnoses [2]. Moreover, even within TBD, some diseases go unnoticed in the spectrum of diseases that could affect humans, even when their zoonotic potential is latent. This is important to choose methods of detection and for treating the patient. In this sense, serological or molecular tools are different to the diagnosis of each TBD, and many hospitals or laboratories do not have the necessary reagents to rule out them. With regard to the management of patients, the appropriate use of medications varies according with the microorganism and in many cases the therapeutic window for patient survival is reduced. In Panama, TBD in humans includes borreliosis (tick-borne relapsing fever related to *Ornithodoros* ticks), *Rickettsia rickettsii* Spotted Fever (RRSF), and also there is one case of ehrlichiosis caused *Ehrlichia canis* in an immuno-competent child [3-5]. Of these, RRSF is the only that has involved fatal cases, and is the only with a national guide for its management [6]. RRSF in Panama has two putative vectors, *Amblyomma mixtum* and *Rhipicephalus sanguineus* s.l., this last species is also the main vector of *Ehrlichia canis* and *Anaplasma platys* in dogs [7]. With close to 50 tick species reported in Panama [8], different research has been reported other microorganisms in Panama, including at least 10 species of *Rickettsia*, *Anaplasma phagocytophilum*, three strains of *Borrelia burgdorferi* complex, *Babesia nr. odocoilei*, and *Hepatozoon* sp. [9-11]. This reflects the variety of microorganisms that have been detected in ticks of Panama, both pathogens and others whose pathogenicity has not been demonstrated. Therefore, it is likely that the spectrum of TBD is higher in this country.

In the last years three patients have been admitted to hospitals in western Panama, which manifested onset of symptoms of 3-5 days, high fever ($\geq 39^{\circ}\text{C}$), headache, myalgia, and gastrointestinal symptoms. The rash was frequent in patients who died, which indicates that it appears in advanced forms of the disease. During the anamnesis, was notorious that these three patients came from rural livestock areas, and it was also confirmed that the patients had had contact with ticks; in fact, one nymph and two adults were removed from the patients during the consultation (Figure 1). Due to the nonspecific symptoms and the presence of ticks, the differential diagnosis included leptospirosis, meningococemia, dengue, and *Rickettsiosis*; all tests were negative. Despite intense medical efforts, the patients died 1-2 days after their admission. No additional samples were extracted to other tests.

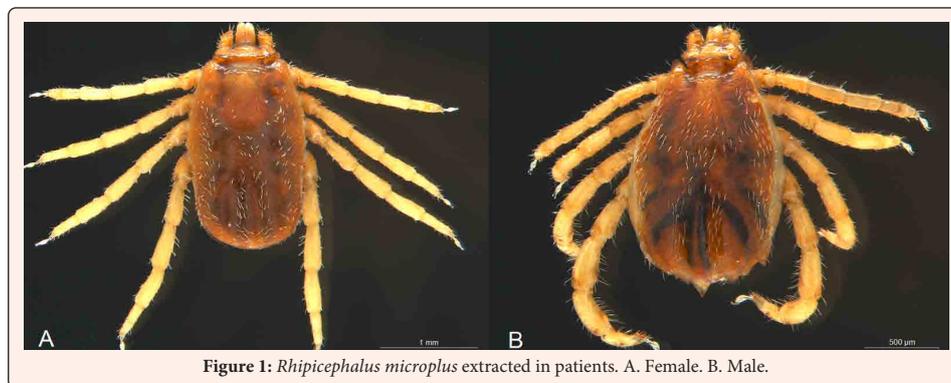


Figure 1: *Rhipicephalus microplus* extracted in patients. A. Female. B. Male.

Rhipicephalus microplus is vector of anaplasmosis (*Anaplasma marginale*, *Anaplasma centrale*), babesiosis (*Babesia bovis* and *Babesia bigemina*), diseases that cause serious economic losses to the livestock industry [12]. In addition, other microorganisms belonging to the genera *Coxiella*, *Anaplasma*, and *Ehrlichia* have been detected in this species. Despite it is a synanthropic species with wide distribution throughout livestock regions, this species is considered as a sporadic parasite of humans [1,2]. Moreover, since *Rhipicephalus microplus* is a one-host tick, authors as Guglielmo and Robbins [1], suggest that the larval infestations are most probably by people entering infested environments, while that the contact of nymphs or adults is for the transference of ticks from infested animals to persons. Although the potential vector of *Rhipicephalus microplus* is not clearly defined for humans, the management of febrile cases associated with this species should broaden the clinical suspicion of other types of TBD. We cannot affirm or rule out that *Rhipicephalus microplus* transmitted any pathogen to our patients; however, the presence of these parasites in patients with febrile indeterminate symptoms should serve as indicators of possible TBD. This would allow for a more comprehensive and inclusive epidemiological approach with other tick species, as well as creating the basis for a better target for pathogens to be analyzed.

References

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