A rare clinical presentation of transplacental transmission and subsequent abortion by *Babesia (Theileria) equi* in a mare

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Abstract The present article deals with the rare presentation of transplacental transmission and subsequent abortion by *Babesia (Theileria) equi*. A pregnant mare was brought with the history of fever and inappetence. Per rectal examination revealed absence of fremitus of the foetus. The foetus was removed using foetotomy. Blood smear examination of the dam and contact smear of the aborted foetus revealed characteristic Maltese cross appearance of *B. equi*. The possible routes of transmission of parasite, its pathogenesis and future strategies are described in the present article.

Keywords Abortion · *Babesia (Theileria) equi* · Transplacental transmission

Introduction

Piroplasmosis poses a threat to livestock health throughout the globe, equines being no exception to this general scenario. Amongst the two worldwide present species affecting equines viz., *Babesia (Theileria) equi* and *B. caballi*; *B(T). equi* is incriminated as a more commonest entity responsible for highly pathogenic and severest form of disease exemplified by haemoglobinuria and death (Chhabra et al. 2012); whereas *B. caballi* causes a more persistent clinical syndrome of fever and progressive anaemia (Georges et al. 2011). However, a wide variation in clinical signs is frequently encountered under the field conditions. The present article depicts a rare clinical entity amongst those variable symptoms in the form of per-acute, fatal transplacental transmission and subsequent abortion of foal by *B(T). equi*.

Materials and methods

A pregnant Marwari mare aged 4 years was presented with the history of dullness, anorexia, fever and high temperature for the last 2 days. Further enquiry revealed that mare was having good health and a sudden fall in appetite coupled with complications of fever and anorexia appeared at once since last few days. Clinical examination of the animal revealed rapid, shallow breathing, nasal discharge, fever, pale mucous membranes and reluctance to walk and/or move. Peripheral blood (5 ml aliquot in EDTA) was aseptically collected and the body hair coat was carefully searched for the presence of acarine parasites. Rectal coprological samples were also collected. The samples were brought to the laboratory for identification of the pathogen(s) and its vectors using standard keys/techniques (Bowman et al. 2003; Hendrix and Robinson 2006).

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Per rectal examination revealed absence of fremitus suggestive of in utero death of the foetus ultimately compelling the clinicians with no option other than to remove foetus using foetotomy. Overall clinical assessment of the patient was suggestive of grave prognosis. The owner was suitably informed. However, the animal could not withstand the severity of the disease and massive infection in circulation. Unfortunately, it succumbed to the disease and could not be autopsied due to theological/religious limitations. However, while removing foetus contact smears were made from semi clotted blood which was also later stained and examined using standard procedures described above.

Laboratory investigation of the peripheral blood smear of the mare as well as the contact smears of the foetus revealed characteristic “Maltese cross appearance” of *B(T). equi*. The animal was having very much higher levels of parasitemia (>70 %) which could be directly attributed to the above stated plight of the animal Fig. 1.

The clinical signs of equine piroplasmosis are often variable and non-specific. Acute infections often results in fever (40 °C), depression, reduced appetite, pallor, icterus, dyspnoea, petechiation, colic, eyelid and distal limb oedema and incoordination (de Waal and van Heerden 2004). In utero transplacental transmission of *B(T). equi* has been reported worldwide (Phipps and Otter 2004; Georges et al. 2011; Allsopp et al. 2007) and often either leads to abortions (de Waal and van Heerden 2004), full term still births or birth of the live foals with neonatal piroplasmosis (Allsopp et al. 2007; Phipps and Otter 2004; Chhabra et al. 2012). The passage of infected erythrocytes

or extra cellular parasitic forms across the foetal placental barrier is supposed to be the most prevalent mode of in utero transmission of *T. equi*. A large number of factors like damage to placental vessels in the event of abortions (Erbsloh 1975), abnormal placentation (Du Plessis and Basson 1966), neonatal conditions like reverse erythroblastosis foetalis (Du Plessis and Basson 1966) and even nature of equine placenta viz., *semiplacenta diffusa incompleta* that provides nourishment to embryo in the form of histotroph consisting of mixture of uterine gland secretions, desquamated epithelial cells and maternal red blood cells and thereby also possibly permitting entry of piroplasms (Gerneke 1985) are the possible reasons for the in utero transmission of the parasite.

Nevertheless, considering the *B(T). equi* prenatal infection a significant emerging field problem, it would be interesting to precisely investigate through well planned experimental studies employing selective and reliable methodologies to elucidate (a) effective integrated therapy aiming at blocking its transplacental transmission coupled with complete elimination of the pathogen from the body of infected dam; (b) exact mechanism of in vivo migration and access of the pathogen to placenta by assessing the details whether the neonates acquired infection in the form of developing microschizonts and/or merozoites from the dam; (c) pathology, immuno-pathogenesis, in infected dam and its offspring; (d) impact of infection on foetal growth, development and health particularly in cases of live births of foals; and (e) epizootiological predisposing factors and reasons for its underreporting by the field veterinarians in the enzootic areas.

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Fig. 1 Characteristic Maltese cross appearance of piroplasm of *B. equi*

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