



## Short Communication

# An Atypical Fatal *Babesia caballi* Infection in a Stage Coach Mare

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## ABSTRACT

The present report describes an atypical, fatal *Babesia caballi* infection in a carriage mare during a winter month. The diagnosis of disease was confirmed by the presence of two pyriform parasites (3.7× 1.3 µm in dimensions) infecting 5% of RBCs in stained peripheral blood smears. Substantive haemato-biochemical changes were depressed hemogram with an accelerated ESR, thrombocytopenia, and hyperbilirubinemia. The patient died 9 h after initiation of therapy with imidocarb dipropionate. Important post mortem findings were generalized icterus, haemorrhagic parenchymatous organs, hepatomegaly, splenomegaly and lobular and lobar pneumonia.

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MS, GA, GM and MNM collected and analyzed the information. MI wrote the article. IK and UI helped in writing the article.

### Key words

Mare, *Babesia caballi*, postmortem findings, stage coach mare.

*Babesia caballi* is a tick-transmitted, intra-erythrocytic protozoan of equines in Asia, Middle East, Africa, Europe and Americas (Santiago and Rosana, 2012) with an incubation period of 10-30 days (Rothschild and Knowles, 2007). This parasite rarely causes haemoglobinuria and is reportedly less pathogenic than *Theileria (T.) equi* (Radostits *et al.*, 2007; Alanazi *et al.*, 2012). The disease manifestations have been reported previously (Rothschild and Knowles, 2007). In Pakistan and India babesiosis is more prevalent from April to August than at other times of the year (Hayes, 1973; Javed *et al.*, 2014). The present report describes an atypical case of *B. caballi* infection in a mare.

### Materials and methods

A 10-year-old nondescript stagecoach mare weighing about 300 kg was presented to the outdoor clinics of the Veterinary Medical Teaching Hospital, University of Agriculture, Faisalabad, Pakistan in winter season for treatment of episodic voiding of reddish urine, persistent fever, subdued appetite, wasting and incapacitation for work of two weeks standing. The animal was completely anorexic for the last two days. Various ethno-veterinary therapies and allopathic

treatments (including antipyretics, antibiotics, tonics, etc) had been instituted prior to presentation but the condition had remained unresponsive.

Clinical examination was performed including the evaluation of body condition score (BCS) as per guidelines of National Research Council (2007), auscultation, measurement of rectal temperature, respiration rate, pulse rate, examination of mucous membranes and palpation of lymph nodes. For laboratory examination, aseptically collected blood sample was employed for making a thick blood smear and stained with Giemsa stain. Blood analysis was also performed manually including red blood cells (RBCs) count, haemoglobin (Hb), packed cell volume (PCV), erythrocyte Sedimentation Rate (ESR), mean corpuscular volume (MCV), mean corpuscular hemoglobin (MCH), mean corpuscular hemoglobin concentration (MCHC), platelet count and levels of bilirubin in blood. Urine sedimentation was also performed with manual microscope to analyse the condition for red blood cells.

After diagnosis, an initial therapy was started in order to cure the animal. The head of the animal was hosed with cold water for 10 min followed by i.m administration of 6 mL of imidocarb dipropionate (12%) solution (Inj. Imizol; Pitman-Moore, UK). Other therapy included Inj. procaine penicilline (8 millions units) IM; Phenoxy-2-methyl-2-propionic acid (Inj. Hepagen 10%; Fatro, Bologna, Italy) 30 mL. IM; Ringer's-lactate-

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dextrose solution (2 L) + Inj. Vitamin B-complex (40 mL) IV. Post-treatment blood analysis was also performed to check the presence of causative agent. The patient died 9 h after initiation of therapy.

### Results

Upon clinical examination, the mare was in a very poor body condition (body condition score 2 as per guidelines of National Research Council, 1996) and was ataxic. She had extremely icteric mucous membranes with livid vibices on the third eyelids. The patient's rectal temperature was 106.4°F (41.3°C), respiration (44 breaths/min) and pulse rates (99/min). The urine was reddish and frothy. Other significant clinical findings included mucopurulent nasal discharge, dehydration, prolonged capillary refill time (>4 sec) and crackles on auscultation of ventral lung field. The body of the mare was free of any external parasite.

A microscopic examination of quick stained peripheral blood smears (Jorvet™, Dip-Quick Stain, Jorgensen Labs. Inc. Loveland, Colorado, 80538, USA) indicated that about 5% of RBCs contained two pyriform parasites (3.7×1.3 µm) with distinct cytoplasm. A repeated microscopic examination of peripheral blood smears at 6 h post treatment was still positive of *B. caballi*. The parasites converged at their pointed ends and subtended an acute angle with each other. These morphometric characteristics of intra-erythrocytic parasite are consistent with those of *B. caballi* (Rothschild and Knowles, 2007). Significant haemato-biochemical alterations included decreased RBCs count (3.9 millions µL<sup>-1</sup>), haemoglobin (7.8 g/dL<sup>-1</sup>), PCV (18%), an accelerated ESR (132/ first 20 min.), thrombocytopenia (72000 uL<sup>-1</sup>), and hyperbilirubinemia (9 mg/dL<sup>-1</sup>). Erythrocyte indices indicated increased MCHC (43.3 g/dL<sup>-1</sup>) and MCV (46.1 fl) (Brar *et al.*, 1999). Microscopic examination of urine sediment was negative for red blood cells.

A diagnosis of babesiosis was reached on basis of above described clinical signs and presence of *B. caballi* in stained blood smears.

Postmortem findings included generalized icterus, accumulation of yellow coloured fluid in pericardial sac and peritoneal cavity, enlargement of lymph nodes, thin watery blood, gelatinous body fat, lobular and lobar pneumonia, haemorrhagic parenchymatous organs, hepatomegaly and splenomegaly. The aforementioned clinical, hematological and postmortem findings helped to differentiate babesiosis from trypanosomiasis (surra), equine infectious anemia, purpura hemorrhagica, equine viral arteritis, equine ehrlichiosis, leptospirosis, red maple leaves poisoning and dourine (Radostits *et al.*, 2007; Alanazi *et al.*, 2012).

### Discussion

Not with standing certain typical characteristics of *B. caballi* infection such as persistent fever, several features epitomized the case described in the present report as atypical for all intents and purposes. In the Indian subcontinent babesiosis is more prevalent from April to August than at other times of the year and *B. caballi* infections are said to occur earlier in the year than *B. equi* (Hayes, 1973.). It is possible that the mare under reference contracted *B. caballi* infection sometimes in summer, only to be precipitated in winter. This may explain an apparent off-season occurrence of the disease in December. Santiago and Rosana (2012) reported that the adult animal may remain carrier up to 2 years after infection with *B. caballi*. Contrarily, *T. equi* infected animal remains carrier for whole life. Mostly the *B. caballi* infected equids are clinically inapparent and carrier animals can show the clinical signs if exposed to any stress.

Haemoglobinuria is an uncommon clinical feature of *B. caballi* infection (Rothschild and Knowles, 2007) and both *B. caballi* and *B. equi* infections are not manifested by this sign in the Indian subcontinent (Hayes, 1973). Such was, however, not the case in the subject mare of the present report that have had been haemoglobinuria episodically for the last two weeks. Furthermore, contrary to the general notion that once haemoglobinuria appears, body temperature drops and the parasites are not easily detectable in the erythrocytes (Ruprah, 1995), the subject mare was hyperpyrexia and *B. caballi* could easily be detected in nearly 5% of RBCs. Rothschild and Knowles (2007) reported that percentage of infected RBCs (parasitemia) from *B. caballi* may be as low as 0.1% and does not go beyond 1% in clinical cases, however up to 10% parasitemia has also been reported. During acute phase of infection microscopic examination of thick stained blood smear (diagnostic test) of the affected equids usually reveals 2-5µm long and 1.3-3µm wide pyriform shaped merozoites with in RBCs forming pairs connected with each other at their posterior ends; however identification of causative agent is very difficult in inapparent carrier animals due to low number of parasites (Razmi *et al.*, 2014, Rothschild and Knowles, 2007).

Repeat blood smears prepared 6 h post imidocarb dipropionate administration were still positive for *B. caballi* in this case. The time lag between administration of this drug and death of *B. caballi* in natural infections is not known. Although, pneumonia has been reported as a complication (Hayes, 1973), it is also possible that pulmonary signs were the reflection of drenching pneumonia since the mare had been treated by various ethno-veterinary therapies for at least two weeks prior to

presentation. Aslani (2000) reported a fatal case of *B. caballi* in foal having icterus, pyrexia, anemia, dyspnea and echymotic hemorrhages at third eyelid and mucosa of mouth. Irrespective to given treatment the foal died. The source of *B. caballi* exposure remains vague. However, it is likely that the mare contracted the disease from carrier equids and stress factor secondary to environment change led to the development of a clinical infection. Although, at initial clinical examination the mare had no detectable external parasite, nevertheless, the possibility that the ticks were the source of infection cannot be ruled out because the owner frequently remove the embedded ticks manually. Previously, different serological and molecular tools have been employed in clinching the diagnosis of equine babesiosis, however, in the present case, none of the forgoing techniques could be used owing to serious financial constraint to the owner. As far as could be ascertained, the occurrence of *B. caballi* has not heretofore been reported from Pakistan.

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