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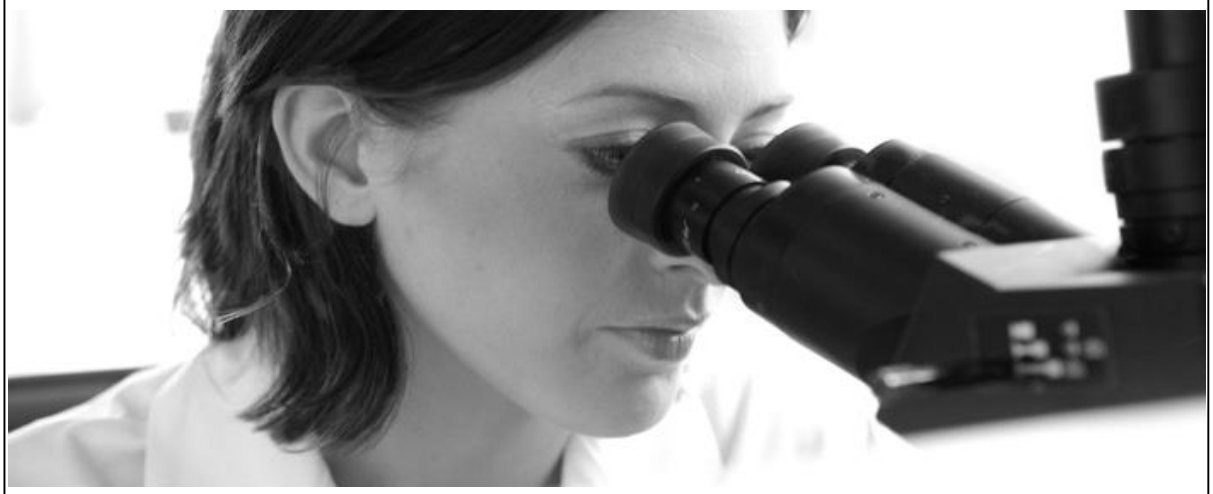

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RESEARCH ARTICLE

ORIENTAL THEILERIOSIS AND SURRA IN A HOLSTEIN-FRIESIAN CATTLE SHED: HERD INVESTIGATION, HAEMATOLOGY AND THERAPEUTIC MANAGEMENT

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ABSTRACT

Assam situated in the North East India has recently been known to be endemic for *Theileria orientalis* besides long known *Babesia bigemina* and *Anaplasma marginale*. This communication reports occurrence of *T. orientalis* in a herd of Holstein-Friesian lactating cattle and concomitant infection with *Trypanosoma evansi* in 2 of them. Herd investigation revealed the animals apparently healthy except 3 which manifested anorexia, depression, drop in milk yield, high fever, tachypnoea and blood values (haemoglobin and packed cell volume) at or below the lower limit of reference range. Giemsa stained blood smear examination revealed presence of crescent or rod shaped piroplasms with trailing cytoplasm of *T. orientalis* in all animals and additional presence of *T. evansi* in 2 out of 3 clinically ill cattle in subsequent blood examination. All the animals received antitheilerial treatment with Buparvaquone (Zubion) @ 2.5 mg/kg body weight in single I/M dose while *T. evansi* positive animals received single dose of Isometamidium hydrochloride (Nyzom) @ 0.3 mg/kg b. wt I/M. Parasite specific treatment along with intravenous Dextrose saline, oral vitamin and mineral supplementation could result resolution of clinical symptoms, progressive improvement in health, appetite and milk yield of animals within a month after treatment.

INTRODUCTION

Vector-borne haemoparasitic diseases viz. babesiosis, trypanosomosis, theileriosis and anaplasmosis are responsible for high morbidity and varying mortality in cattle and occupy a major position next to viral and bacterial diseases in so far their affect on health and productive performance of the animals are concerned. In India, Assam and neighboring states of the North East have long been known to be endemic for tick borne babesiosis and tick and blood sucking fly borne anaplasmosis caused by *Babesia bigemina* and *Anaplasma marginale* respectively (Singh *et al*., 1978). Recent epidemiological study concluded with inclusion of *T. orientalis* in the list of haemoparasites of cattle endemic in Assam (Kakati and Sarmah, 2014). Despite wide spread prevalence reports of *T. evansi* in cattle from Northern India (Gill, 1991; Juyal *et al*., 2005) this parasite is less reported from the North East (Roychoudhury *et al*., 1978). The present communication summarizes the investigation conducted in a herd of Holstein-Friesian cattle affected with Oriental theileriosis and surra caused by *T. orientalis* and *T. evansi* respectively and their therapeutic management.

MATERIALS AND METHODS

A private unorganized cattle shed having 9 lactating Holstein-Friesian cows and located within the Guwahati city, Assam was attended after a call to investigate the prevailing disease condition in animals. The presenting complaints were lethargy, anorexia and gradual drop in milk yield from an average 10 litres/day. The animals with history of tick infestation were physically examined and blood samples were collected for haematological and parasitological evaluation. Clinical examination revealed the animals apparently healthy except three which showed sternal recumbency, depression, lethargy, mild bloat, pale mucous membrane, elevated body temperature (104-106ºF) and presence of respiratory signs like nasal discharge and tachypnoea. Blood examination of sick animals revealed lowered haemoglobin (Hb) and packed cell volume (PCV) which ranged from 5.7-6.8 g% and 19.6-21.4% respectively. The remaining animals although apparently looked normal, however showed Hb and PCV in and around the lower limit of respective normal range (8-14 g% and 25-45%). Microscopic examination of Giemsa stained blood smears showed presence of frequent parasitaemia due to crescent, rod like and comma shaped piroplasms with trailing

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cytoplasm. Based on morphological study and previous report (Sarmah and Kakati, 2014) a diagnosis of *T. orientalis* infection (Figure-1) was made in all the animals of the shed. Similar examination reported after 10 days showed presence of leaf shaped extracellular haemoflagellates indistinguishable from *T. evansi* (Figure-2) in 2 clinically ill cattle which continued to show intermittent fever even after antitheilerial treatment. The investigation based on performed clinical, haematological and parasitological examination concluded with a diagnosis of latent to clinical form of oriental theileriosis in the animals and additional diagnosis of surra in two of them.

RESULTS

All animals were administered with single intramuscular dose of Buparvaquone (Zubion[a]) @ 2.5 mg/kg body weight. The sick animals (3/9) received in addition, intravenous Dextrose saline for 3 days and oral supplementation with vitamins and minerals (Feritas bolus [a]) for a week. Antitrypanosomal treatment with a dose of isometamidium hydrochloride (Nyzom[a]) @ 0.3 mg/kg body weight I/M was provided to the animals found positive to *T. evansi*. The sick animals responded to parasitic specific treatments by resolution of clinical symptoms, improvement in health and appetite of the animals. Haemoglobin and PCV values remained stable or elevated (5.9-8.4 g% and 19.6-33.8%) at 15 days after treatment. Improvement in physical appearance and restoration of milk yield to a level of 7-8 litres/day was noticed within a month of recovery.

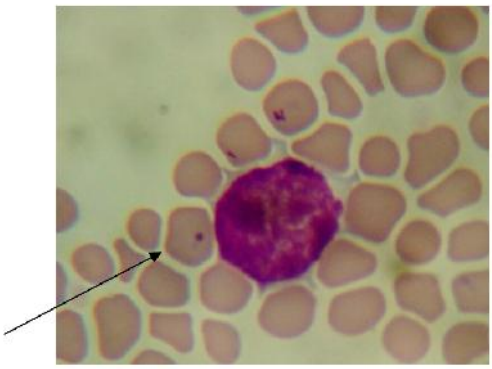

Figure 1 *Theileria orientalis* parasite inside red blood cells.

Figure 2 *Trypanosoma evansi* in blood smear

DISCUSSION

Present record of *T. orientalis* associated with clinical illness in crossbred cattle and the previous reports (Sarmah and Kakati, 2014; Dewan *et al*., 2014) confirmed its widespread prevalence in and around Guwahati. It was about a year ago that *T. orientalis*, the only species of *Theileria*, identified in cattle from Assam on the basis of morphology, serological and molecular tests and the species was linked to clinical and subclinical infections (Kakati and Sarmah, 2014). Pathogenic potential of this species also agreed to the recent report made by Aparna *et al*. (2011) from Kerala, India and other countries (Kamau *et al*., 2011). Detection of anaemia in the present investigation in cattle having infection with *T. orientalis* which received little or no attention in the past (Shastri *et al*., 1988) is of great epidemiological significance at a time when *T. annulata* causing bovine tropical theileriosis has been known to be endemic in different parts of India (Sangwan, 2014).

[a] ***Brand of Neovet, Intas Pharmaceuticals Ltd, Ahmedabad***

Detection of *T. evansi* causing acute surra in the present investigation is also another new insight for Assam since the parasite having wide distribution in different parts of the country is being less frequently reported from this region. This might be due to presence of a very small population of equines, the principal host of *T. evansi* in this region. The parasite in the present investigation was detected during second blood smear examination only when the two animals continued to manifest fever inspite of antitheilerial treatment. Although cattle act as latent carrier of *T. evansi* (Ray *et al*., 1990), several outbreaks of clinical surra with detectable parasitaemia as observed in the present study have also been reported from elsewhere (Kumar *et. al*., 2012). Epidemiology of this blood sucking fly transmitted parasite is less explored in the North East and requires further study using serological and molecular methods. It is expected to have a better understanding of the impact of both the parasites as the health and productivity of the high yielding cattle of this region.

Good clinical response to the performed buparvaquone and isometamidium hydrochloride therapy observed in the present investigation confirmed the literature facts for their respective curative effect against *T. orientalis* (Carter, 2011) and *T. evansi* (Kumar *et al*., 2009).

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