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## Incidence, diagnosis and therapeutic management of anaplasmosis in cattle

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### Abstract

Bovine anaplasmosis is also known as gall sickness. It is an infectious, transmissible and tick born disease of bovines and caused by *Anaplasma* species. It is causing significant losses in the livestock industries due to the high morbidity and mortality in susceptible cattle herds so it is highly economically important rickettsial diseases affecting all ruminants. It is mainly transmitted by a tick of *Rhipicephalus* species. Present study on incidence, diagnosis and therapeutic management of anaplasmosis in cattle was conducted at Veterinary Clinical Complex, PGIVER, Jaipur during September, 2022 to September, 2023. Total 72 suspected cattle were reported with history of high fever, dull, off feed, decreased water intake etc. During Haematological examination, revealed decrease haemoglobin (Hb), low packed cell volume (PCV) and slight neutrophilia and 30 cattle affected with dot shaped *Anaplasma marginale* on margin of erythrocyte in microscopic blood parasite examination. Overall incidence of anaplasmosis by blood smear was 41.66 percent. Animals recovered uneventfully upon treatment with oxytetracycline and supportive therapy.

**Keywords:** Anaplasmosis, anaemia, thrombocytopenia, rickettsial, oxytetracycline

### Introduction

Bovine anaplasmosis is endemic in tropical and subtropical areas of the world. Anaplasmosis is one of the most infectious, non-contagious and tick born disease in cattle, sheep, goats, buffalo and some wild animals which is transmitted by at least 20 hard ticks species and mechanically by some biting arthropods. There are many *Anaplasma* species parasites, but *Anaplasma marginale* and *Anaplasma Centrale* are the most important species. Anaplasmosis is usually caused by *Anaplasma marginale* in bovines (Wahba *et al.*, 2017) [11]. Transmission of *Anaplasma marginale* can be affected both mechanically by biting flies or blood contaminated fomites and biologically by ticks (Kocan *et al.*, 1992) [7]. *Anaplasma* multiplies within erythrocytes and causing clinical signs include anaemia, jaundice, high fever, abortion, decreased milk production and sometimes sudden death. Diagnosis of anaplasmosis is performed routinely by Giemsa-stained blood smears which can indeed be used as suitable method to detect *Anaplasma* in animals (Carelli *et al.*, 2007) [4].

### Materials and Methods

For haematological examination, blood samples were collected from the jugular vein, using a 18 gauge 2.5 cm long sterilized needle and 10 ml disposable syringe. Out of which, 5 ml blood was collected in sterilized test tube containing disodium salt of ethylene diamine tetra acetic acid (EDTA) as an anticoagulant @ 1 mg/ml of blood.

For blood parasites examination, blood samples collected and screened by thin blood smear examination. Blood was collected from the peripheral circulation such as ear tip for making smears. A small drop of blood was placed on the pre-cleaned and grease free slide. Another slide was used as spreader for making thin blood smears. The edge of spreader slide was touched with the blood drop by keeping at 30°-45° angle on first glass slide and thin smear was made. The smear were labelled and allowed to air-dry for 10- 15 minutes. The dried blood smears were flooded with methylene alcohol for 10 minutes, left to air-dry and stained with Giemsa's stain (Himedia Laboratories Pvt. Ltd, Mumbai, India). The blood smears were examined under the oil immersion lenses (x100) of microscope.

## Results and Discussion

In present investigation, a total 72 cattle suspected for anaplasmosis were screened on the basis of clinical signs but 30 cattle were found positive for anaplasmosis by microscopic blood parasitic examination with overall incidence of 41.66 percent. This present findings agreed with Rajput *et al.*, (2005)<sup>[10]</sup> and Bhatnagar *et al.*, (2015)<sup>[3]</sup> who reported 41.00 percent and 42.07 percent, respectively.

In this investigation for blood parasitic examination and haematological examination, 30 cattle were found positive out of 72 for anaplasmosis. In Giemsa Staining blood smear, found *Anaplasma marginale* during blood parasitic examination. On microscopic examination, *Anaplasma* species were seen as compact spherical masses, inside the red blood cells near the periphery of RBCs wall. These observation are in accordance with Kumar *et al.*, (2015)<sup>[8]</sup>.

In this investigation, anemia and mild neutrophilia were found in thirty cattle which affected with anaplasmosis. Similar findings were earlier reported by Mahadappa *et al.*, (2017)<sup>[9]</sup>.



Fig 1: Emaciated cattle due to *Anaplasma marginale*



Fig 2: Pale mucous membrane



Fig 3: Presence of dot shaped *Anaplasma marginale* on margin of erythrocyte (in arrow) in Giemsa stained blood smear

## Therapeutic Management

The cattle are treated with 3 dose of Oxytetracycline (50 mg/ml) and 2 dose of Imidocarb dipropionate used in the affected cattle with anaplasmosis. To combact anaemic changes haematinics drugs with also advised of beet for haemoglobin boost as a supportive therapy were also prescribed to affected cattle with anaplasmosis.

This is in agreement with the findings of Ananda *et al.*, (2009)<sup>[2]</sup>; Doyle *et al.*, (2016)<sup>[5]</sup>. Ananda *et al.*, (2009)<sup>[2]</sup> who stated that oxytetracycline is more effective at higher doses in anaplasmosis. Afifi *et al.*, (2014)<sup>[1]</sup> and Doyle *et al.*, (2016)<sup>[5]</sup> concluded that Imidocarb dipropionate is more effective in anaplasmosis.

All cattle affected with anaplasmosis were recovered within 7 days but hematinics drugs continued for 1 month.

## Conclusion

In present investigation, overall incidence of anaplasmosis in cattle by blood smear examination was 41.66 percent. The blood smear examination can be used for diagnosis of anaplasmosis in filed condition. In anaplasmosis, imidocarb dipropionate gives better results with higher doses of oxytetracycline. Anaplasmosis is more found in cross breed cattle which cause by various *Anaplasma* species.

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