**Prevalence of haemoprotozoan infection in bovines of Telangana state**

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**ABSTRACT**

A retrospective observational descriptive study was conducted to record the prevalence of haemoprotozoan infections in bovines of Telangana state during September to December 2017 under mobile veterinary clinics of GVKEMRI, PAS Project- 1962. A total of 1264 blood samples (572 cattle and 692 buffaloes) were collected and examined by Giemsa staining.

The results of the present study revealed 7.43 per cent (94) of overall incidence. Out of 572 cattle samples 67(11.71 %) were found positive and in which 26(38.80 %) were positive for *Theileria spp*, 24(35.82 %) for *Babesia spp* and 17(25.37%) for *Trypanosoma spp*. Out of 692 buffalo samples, 27(3.90%) were found positive and out of that 17 (62.96 %) were for *Trypanosoma spp,* 08 (29.62 %) were*Babesia spp* and 02 (7.40 %) for *Theileria* spp. The findings of the present study revealed that among bovines the highest prevalence of *Trypanosoma spp* followed by *Theileria* spp and *Babesia spp*.

**Keywords- Haemoprotozoan infection, Bovine, Telangana state, Giemsa stain, *Trypanosoma spp, Theileria* spp, *Babesia spp***

**INTRODUCTION**

 There are a total of 9.5 million cattle population including buffalo in the 31 districts of Telangana state (Livestock Census, 2015). GVKEMRI is a non-profitable organization providing emergency response and health care services to the animals in Public private partnership (PPP) model saving numerous lives in term of its dial 1962 service introducing Mobile Veterinary Services with basic laboratory facilities like blood smear examination, milk sample and fecal examination.

Haemoprotozoan parasites which are vector borne especially Babesiosis, Theileriosis and Trypanosomiasis are considered as the major impediments in the health and productive performance of bovines which causes anemia by inducing erythrophagocytosis (Rajput *et al.,* 2005). These diseases cause substantial losses to the livestock industry throughout the world (Ananda *et al.,* 2009) in the form of serious economic impact due to obvious reason of death, decreased productivity, lowered working efficiency (Uilenberg, 1995) increased cost for control measures (Makala *et al.,* 2003).

In India, an annual loss of 800 million US dollars due to tropical theileriosis was reported (Devendra, 1995). The prevalence of haemoprotozoan infection has been reported in animals from different parts of India except Telangana state (Agarwal *et al.,* 2003; Muraleedharan *et al.,* 2005; Shahanawaz *et al.,* 2011; Vahora *et al.,* 2012; Arun Kumar *et al.,* 2013; Kohli *et al.,* 2014). However, true status of haemoprotozoan infections has not yet been explored in bovines in and around Telangana. Hence in this context, an attempt was made to investigate the prevalence of haemoprotozoan infections in cattle and buffaloes of Telangana state.

**MATERIALS AND METHODS**

The present study was conducted by 99 Mobile veterinary clinics (MVC) working under PAS project which is run by Telangana State government and GVK EMRI under PPP mode. Each MVC is having team of 4 members consist of Doctor, paravet, captain and attender connected to emergency response center (ERC) which has team of veterinarian and emergency response officers (ERO).

ERC is accessible to livestock owners and farmers by toll free helpline number 1962. As soon as complaint is received by ERC from farmer the case is assigned to concern MVCs which is having GPS availability. Mobile Veterinary Clinic will contact the animal owner and convey time of visit and update status in Call centre system.

The animals with signs of fever, anorexia, loss of weight, no response to the treatment and other signs viz. anaemia, enlargement of lymph nodes, haemo-globinuria, circling movements, respiratory distress, grinding of teeth, sudden drop in milk yield and abortion were screened for haemoprotozoan infections for a period of 4 month months during September to December 2017 from 31 districts of Telangana state. A total of 1264 bovine blood samples (572 cattle and 692 buffaloes) were collected and investigated for the present study.

A drop of blood from each animal was collected aseptically from ear vein. Thin blood smears were prepared and immediately brought to the mobile veterinary clinic van for the detection of haemoprotozoan parasites by Giemsa stain specially wet blood smear for Trypanosomes. These field records were recorded in given Lenovo laptop which is having specially designed software and these records will be directly accessed into a server which is located in service call center.

**RESULTS AND DISCUSSION**

In the present study, a total of 1264 bovine’s blood smears examined, 94 were found positive (67 cattle and 27 buffalo) (Table no.1) which indicates an overall prevalence of 7.43 percent in the Telangana State. The overall prevalence is in accordance with the findings of Bhatnagar *et al.* (2015) who reported an overall 9 per cent prevalence of haemoprotozoan infection in cattles of Southern Rajasthan. The slight low in the prevalence of infection in the present study might be due to various factors which reduce the chance of parasite detection in blood smear like very low sensitivity of microscope, time of blood collection, site of blood collection etc. (Tuli *et al.,* 2015).

Out of 67 positive cases of cattle, 26 (4.54 %) were positive for *Theileria annulata*, 24 (4.19 %) for *Babesia bigemina* and 17 (2.97 %) for *Trypanosoma evansi.* Similarly*,* among 27 positive cases of buffalo, 17 (2.45 %) showed *T. evansi,* 08 (1.15 %) found positive for *B. bigemina* and 02 (0.28 %) were found positive for *T. annulata* (Table 2). Highest prevalence of *T. annulata* infection was observed in cattle followed by *T. evansi* and *B. bigemina* infection. Results of the present study are contrary to the findings of Ananda *et al.* (2009) who reported 31 per cent prevalence of *T. annulata* followed by 12 per cent of Babesiosis in crossbred cattle from Bangalore region of Karnataka. Theileriosis is a fatal parasitic disease and its prevalence has been recorded as 21.1 per cent in Tamil Nadu (Anandan *et al.,* 1989), 16 per cent in Northern Kerala (Nair *et al.,* 2010), 17.7 per cent in Karnataka (Muraleedharan *et al.,* 1994), 45.4 per cent in Dehradun (Uttarakhand) (Kohli *et al.,* 2014) and 4.86 per cent in Punjab (Mahajan *et al.,* 2013).

In contrast to cattle, higher prevalence of *Trypanosoma* was observedin buffaloes followed by *Babesia* and *Theileria*. The findings of the present study for prevalence in buffalo population is in close agreement with the reports of BhaskaraRao and Hafeez (2005) found 7.28 per cent prevalence and Laha *et al* (1989) recorded an incidence of 2.69 per cent in buffaloes while Krishnappa *et al.* (2002) recorded the same incidence as 12.9 per cent in Karnataka. In contarary to the present findings Roy *et al.* (2004) recorded a high prevalence (22.03%) of trypanosomiasis in Chattisgarh (Punjab). Prevalence varied with the vector, availability of host and/or climatic conditions (Rajeshkumar e*t al.*, 2010).

In the present study, the age wise highest prevalence of haemoprotozoan infection (Table no. 3) among positive animals were also recorded and found that infestation were high in more than 3 years of age (73.40%) compared to 1-3 years (26.59%) of age. The findings of the present study are in accordance with Roy *et al.* (2004) and Chakrabarti (2007) reported highest prevalence in animals aged more than 3 years followed by the lowest prevalence in less than 3 year age group. Inverse age resistance and stronger passively acquired immunity might be the contributing factors behind the lower incidence of haemoprotozoan parasites in younger age groups of animals. Higher prevalence of haemoprotozoan infection in middle age animals may be attributed to different types of stress *viz.,* cycling heat, production, vaccination and reproduction (Tuli *et al*., 2015). The haemoprotozoan infestation in low in young animals might be due to close keeping to the homestead where ticks and biting fly habitat has been destroyed and higher in middle and older aged animals because they are usually driven for grazing and watering were ticks and biting flies population is higher.

The sex wise highest prevalence (Table no. 4) was observed in females (76.59%) as compared to males (23.40%).The findings are in agreement with Tuli *et al.* (2015) who reported higher incidence of theileriosis in females and noted that this may be attributed to higher hormonal stress in milch animals and high density of tick population thereby increasing the risk of exposure to infection.

General clinical signs encountered from affected animals were anorexia, high body temperature, change in mucus membrane color, anaemia, enlargement of pre-scapular lymph nodes, haemo-globinuria, circling, respiratory distress, grinding of teeth, corneal opacity, lacrimation, reduced milk yield, rough body coat and abortion.

To record the some of the clinical signs the cases were minutely observed and divided in groups to co-relate rectal temperature and color of conjunctival mucus membrane. During the study, in 41 cases the rectal temperature was more than 103оF whereas in 26 (27.65%) cases the it is in range of 101-103оF (Table no. 5). Among 94 positive cases of haemoparasite, 45 (47.87%) animals showed pale conjunctival mucus membrane (CMM) however, 26 (27.65%) were slight pale, 12 (12.76%) congested, 06 (6.38%) icteric and remaining 05 (5.31) showed normal (Table no.6).

More or less similar clinical signs were also reported by Chakrabarti (2007) and Radostits *et al.* (2010) in affected cattle and buffaloes.

**CONCLUSION**

The present study revealed the overall 7.43 per cent incidence of haemoprotozoan infection in 31 districts of Tealangana state during the course of study and is more common in cattle (11.71%) as compared to buffalo (3.90%). Among the bovine population screened, the prevalence of Trypanosomiasis was found higher as compared to babesiosis and theileriosis which are more commonly occurred in females of elder age group as compared to males. Bovines exhibiting fever, enlargement of superficial lymph nodes, pale mucous membranes and other symptoms and/or not responding to any sympotomatic and antibiotic treatment. Such animals should be suspected and screened for haemoprotozoan infection. The specificity and sensitivity of blood smear examination for diagnosis of haemoprotozoan infection can be enhanced by good smear preparation, proper staining and experienced technician for microscopic examination for further fruitful results.

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**Table 1.Species wise incidence of haemoprotozoan infection of Telangana state**

|  |  |  |  |
| --- | --- | --- | --- |
| **Species** | **No. of animals screened** | **No. of animals positive** | **Prevalence (%)** |
| Cattle | 572 | 67 | 11.71 |
| Buffalo | 692 | 27 | 3.90 |
| **Total** | **1264** | **94** | **7.43** |

**Table 2.Parasitic infestation incidence in cattle and buffalo population of Telangana state**

|  |  |  |
| --- | --- | --- |
| **Species** | **Cattle population Positive (%)** | **Buffalo population Positive (%)** |
| Babesia | 24 (4.19) | 08 (1.15) |
| Theileria | 26 (4.54) | 02 (0.28) |
| Trypanosoma | 17 (2.97) | 17 (2.45) |
| Total | **67 (11.71)** | **27 (3.90)** |

**Table 3. Age wise prevalence in cattle and buffalo population of Telangana state**

|  |  |  |  |
| --- | --- | --- | --- |
| **Sr. No.** | **Age** | **No. of Animals positive** | **Percent positive** |
| 1 | 1-3 year | 25 | 26.59 |
| 2 | >3 year | 69 | 73.40 |
| Total | 94 | 100 |

**Table 4. Sex wise prevalence of haemoprotozoan infection**

|  |  |  |  |
| --- | --- | --- | --- |
| **Sr. No.** | **Age** | **No.of animals positive** | **Percent positive** |
| 1 | Male | 22 | 23.40 |
| 2 | Female | 72 | 76.59 |
| **Total** | **94** | **100** |

**Table 5. Rectal temperature wise incidence of infection**

|  |  |  |  |
| --- | --- | --- | --- |
| **Sr. No.** | **Temp. range** | **No. of animals positive** | **Percent positive** |
| 1 | 101-103 | 26 | 27.65 |
| 2 | >103 | 41 | 43.61 |
| **Total** | **94** | **100** |

**Table 6.Conjunctival mucus membrane wise distribution of cases**

|  |  |  |  |
| --- | --- | --- | --- |
| **Sr. No.** | **Mucus membrane Colour** | **No. positive** | **Percent positive** |
| 1 | Normal | 05 | 5.31 |
| 2 | Pale | 45 | 47.87 |
| 3 | Slight pale | 26 | 27.65 |
| 4 | Congested | 12 | 12.76 |
| 5 | Icteric | 06 | 6.38 |
| **Total** | **94** | **100** |



Swollen lymph node



Babesia bigemina