CHAPTER – V
SUMMARY AND CONCLUSIONS

In a multifaceted approach, the present study on the “Clinical studies and therapeutic management of babesiosis in Gir animals” was undertaken for the period of eight months (November 2016 to June 2017) where in 100 Gir animals selected for the screening in relation to clinical and sub clinical infection of babesiosis prevalent around Junagadh district of Gujarat state with a view to study the diagnosis of babesiosis with haemato-biochemical changes and therapeutic management of clinical cases of babesiosis. The information was collected by brief inquiries at clinical cases coming at Teaching Veterinary Clinical Complex, College of Veterinary Science and Animal Husbandry, Junagadh Agricultural University, Junagadh and gaushalas of Junagadh district of Saurashtra region using standard proforma. The diseased Gir animals included in the study were evaluated for general clinical examination which was further substantiated by special diagnostic techniques viz., stained blood smear examination, PCR test, so as to arrive at an appropriate diagnosis. Among them, 20 clinical cases of Babesia infected Gir animals were subjected to study of haemato-biochemical changes and its therapeutic management, using antibabesiacidal drug with an apparently favorable prognosis.

The diagnosis of Babesia infection remains a challenge, particularly since the parasitaemia was often very low and fluctuating in a majority of infections. It was diagnosed on the basis of the clinical signs and symptoms, by demonstration of the causative organism or by reactions to diagnostic tests.

Total 100 Gir animals was screened for diagnosis of babesiosis in which 20 Gir animals clinically infected with Babesia were subjected to clinical examination for presence of ticks on the body. There was moderate to heavy tick infestation observed in Gir animals. Out of 20 clinically infected Gir animals, 17 were infested with the ticks which were identified as Rhipicephalus (Boophilus) microplus.

Twenty Gir animals clinically affected with babesiosis showed clinical signs of anorexia, emaciation, pale mucous membrane of eye and dullness and depression. The other signs were high fever, serous nasal discharge, congested mucous membrane of eye in initial stage, reluctance to move, decreased milk yield, salivation,
lacrimation from eye and haemoglobinurea. The rectal temperature, heart rates and respiration rates per minute were increased in affected Gir animals.

Out of 100 thin blood smears were examined by Giemsa stain, 40 (40 %) were found positive on stained thin blood smear examination for *Babesia* spp.

The molecular detection of babesiosis in Gir animals was done by conventional polymerized chain reaction (PCR). A total of 100 suspected blood samples were processed for detection of babesiosis out of which, 67 (67 %) were found positive in PCR.

Comparative study of diagnosis based on clinical signs, blood smear examination and PCR was conducted. Clinical signs diagnosed low proportion (20 %) of *Babesia* infection and blood smear examination picked up 40 % of infection, whereas PCR detected 67 % of infection.

In the present study, haemato-biochemical analysis of infected Gir animals was also performed to rule out the severity of disease condition and probable outcome of disease. Red blood cells count, packed cell volume, haemoglobin concentration, mean corpuscular haemoglobin concentration and platelet counts of infected Gir animals were significantly lower (P<0.001) than that of control group of Gir animals. However, values for the mean corpuscular volume, mean corpuscular haemoglobin, total leucocyte count and differential leucocyte counts were at par in the affected Gir animals as compared to control group.

The significant (P<0.001) increase in aspartate aminotransferase and alanine aminotransferase level was observed in *Babesia* infected Gir animals as compared to control group of animals. The non significant difference in blood urea nitrogen and serum creatinine level was observed in infected Gir animals compared to control group of Gir animals. The blood glucose level was significantly (P<0.001) increased in infected Gir animals as compared to control group of animals. The total serum protein and albumin were significantly (P<0.001) decreased in infected Gir animals as compared to control group. However, there was no significant difference in globulin level among infected Gir animals compared to control group.

In the present study, twenty cases that were diagnosed to have clinical babesiosis were treated with diminazene aceturate @ 3 mg/kg BW and imidocarb dippionate @ 1 mg/kg BW, deep IM along with supportive therapy and Ketoprofen @ 3 mg/kg BW, IM (NSAID). Supportive therapy and NSAID were used for at least
3 days or depending upon the severity of infection. While one animal from Group-I (Diminazene aceturate) was required second treatment for complete recovery.

CONCLUSIONS

Based on the observations made in the present clinical study, following conclusions could be drawn.

1. Total 80% of Gir animals were infested with ticks which were identified as *Rhipicephalus (Boophilus) microplus*. Amongst, 20% Gir animals were mixed infested with *R. (B.) microplus* and *Hyalomma anatolicum*.

2. PCR detected 67% of *Babesia* infection in Gir animals. Amongst, 40% was found positive in thin blood smear examination which includes clinically *Babesia* positive animals.

3. Predominant clinical findings exhibited by the Gir animals were anorexia, progressive emaciation, pale mucous membrane of eye, dullness and depression in *Babesia* spp. infection.

4. Haematology of *Babesia* infected Gir animals revealed significant decrease in Hb, RBC, PCV, MCHC and Platelet counts indicative of anaemia which is concurrent with babesiosis.

5. Serum biochemistry of *Babesia* infected Gir animals revealed significant decrease in level of total serum protein and albumin which is suggestive of chronic stage of disease leading to hypoproteinaemia whereas, significant increased AST and ALT level indicated to liver function impairment.

6. The *Babesia* infected Gir animals exhibited good response following administration of imidocarb dipropionate @ 1 mg/kg BW IM with supportive therapy and NSAID. While diminazene aceturate @ 3 mg/kg BW IM also gave good results in terms of recovery.