**INVESTIGATION OF CLINICAL PROTOZOAL CASES IN ANIMALS AT INTERNSHIP PLACEMENTS IN BANGLADESH AND INDIA**

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**CHITTAGONG VETERINARY AND ANIMAL SCIENCES UNIVERSITY**

**KHULSHI, CHITTAGONG-4225**

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**Clinical report Submitted as per approved as to style and content**

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I

**Abstract**

The study was carried out at different placement for studying clinical cases in different livestock species along with their various parameters during February to April 2014 in Ishwarganj Upazila Veterinary Hospital, Mymensingh and during Jun to July 2014 in India. A total 26 cases were collected from above places using structured record keeping sheet. The following information was recorded: Species, breed, age, sex, body weight, clinical sign of different cases and drugs prescribed in those diseases. Cases were evaluated by taking rectal temperature, observing mucous membrane, palpating lymphnode and observing the presence of ticks, maggot and urine color. The collected data were stored and cleaned in the Microsoft Excel program 2007 and then exported to STATA-13 (College Station, Texas 77845, USA). Collected 26 clinical cases of different livestock species were examined during that period. Among all cases there were Babesiosis (4 cases), Anaplasmosis (5 cases), Theileriosis (6 cases) in India and Myiasis (11 cases) whereas cattle (n=18) were mostly infected than other species. The common sign was Coffee colored urine and swollen lymphnode (Babesiosis), swollen pre-scapular lymphnode (Anaplasmosis), nodules across the surface of the body (Theileriosis) and wound along with maggot (Myiasis). Oxytetracycline was mostly used for treating protozoal diseases and after removal of maggots, povidine iodine, naphthalene and ivermectin was used for treating myiasis.

**Key words:** hemoprotozoa, babesiosis, Anaplasmosis, theileriosis, Myiasis, Prevalence

II

**CHAPTER I**

**Background**

Hemoprotozoan diseases especially Babesiosis, Anaplasmosis, Theileriosis and Trypanosomiasis are considered some of the major impediments in the health and productive performance of cattle (Rajput *et al.*, 2005). Tick-borne diseases cause substantial losses to the livestock industry throughout the world (Ananda *et al*., 2009); Kakarsulemankhel, 2011) as these have got a 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) and limited introduction of genetically improved cattle in an area (Radostits *et al*., 2000). In case of haemoprotozoal diseases Babesiosis in cattle is caused by *Babesia bovis* (includes, *Babesia argentiana*, *Babesia berbera*), *Babesia bigemina*, *Babesia major*, *Babesia divergens*, *Babesia ovata* (1), *babesia ovata oshimensis* (n.var) (2) (Blood *et al.,* 1968). Two important species in cattle causes Babesiosis namely *Babesia bigemina* and *Babesia bovis* (Marck Veterinay Manual, 9th edition). Anaplasmosis in cattle and wild ruminant is caused by *Anaplasma marginale and Anaplasma centrale. Anaplasma centrale* is closely related to *Anaplasma marginale* and causes mild Anaplasmosis in cattle (Blood *et al,* 1968*).*the most important species are *Theileria parva* and *Theileria anulata* which cause widespread death in cattle and buffalo in tropical and sub-tropical areas of the world (Merck Veterinary Manual, 9th edition.). In case of larval infestation the casual agent of Myiasis in different species are *Lucilie sericata, Lucilie cuprina, Phomina tera-noval, Phomina regima, Calliphora vomitoria, Hypoderma Spp, Oestrous ovis, Gastrophilus Spp, Chrysomia bezziana, Crysomia chloropyga and Musca domistica.*(Patton, 1922).

In case of common hosts for different haemoprotozoal diseases such as Babesiosis is cattle, buffalo, sheep, goat and Anaplasmosis is cattle, Theileriosis is cattle, buffalo and Myiasis cases common hosts is cattle, goat, sheep,dog,rabbit etc. The most frequent host for myiasis is cattle and goat (46.4%), followed by dogs (15.3%), humans (14.7%), pigs (6%), horses (4%) and sheep (1%) (Sergio *et al.,* 2007). Among hemoprotozoan diseases, babesiosis and anaplasmosis are the more prevalent in different areas of Bangladesh where Samad *et al*., (1989) recorded the highest 14.53% babesiosis and Chowdhury *et al*., (2006) recorded 70% anaplasmosis in Sirajgong district. Talukdar and Karim (2001) also documented higher prevalence (33%) of anaplasmosis in Baghabari area,Sirajgong. Siddiki *et al*., (2010) recorded lower prevalence of hemoprotozoan diseases in crossbred cattle in some areas of Chittagong district. Prevalence of blood protozoa such as Babesia bigemina, Theileria annulata, Theileria mutans and blood rickettsia such as Anaplasma marginale, Anaplasma centralehas been reported in animals of Bangladesh (*Samad et al*., 1984).

In India, Theileriosis is a fatal parasitic disease and has been reported from various geographical regions of thecountry and recorded as 21.1 % in Tamil Nadu (Anandan *et al*., 1989). Samad (1989) reported the occurrence of sub-clinical Anaplasmosis infection in cattle was 5 % in India. Major consequences of haemoprotozoal diseases is loss of body weight, decreases production destruction of erythrocyte causes severe anemia and finally sever patient turned into death. In case of myiasis consequences is poor body weight, decrease production and also septicemia causes to death. Primary myiasis without treatment for two weeks or more can cause death of the animals in seasons when flies are numerous, due to repeated and intensive infestations. It is more dangerous in sheep, goat and horse than cattle and dog. Wounds treated within four days after infestation usually recover though it may take about a month. Secondary myiasis easily responds to treatment (Venugopalan, 2000).

Prevention and control of haemoprotozoal diseases for infected animals firstly isolated and give proper specific and supportive therapy with proper hygienic management and strictly programme to be taken to control of tick population by dipping, spraying at periodical interval with acaricide. (Blood *et al.,* 1998). To prevent myiasis there is a need for general improvement of sanitation, personal hygiene, and extermination of the flies by insecticides. Clothes should be washed thoroughly, preferably in hot water, dried away from flies, and ironed thoroughly. The heat of the iron kills the eggs of myiasis-causing flies (Charles *et al*., 2004).

Clinical diagnosis and treatment for Babesiosis can be done by clinical signs, the history, and the geographic regions are often suggestive of Babesiosis. Therefore, microscopic demonstration of the parasite is necessary to confirm the diagnosis (Howard, 1985) Anaplasmosis the diagnosis is made on the basis of clinical symptoms, hematological changes and microscopic examination of stained peripheral blood films for intraerythrocytic inclusion bodies(Ristic, 1981).In Theileriosis lymphnode are swollen and in dead animals in impression smears of lymphnode and spleen. In advanced cases, Giemsa stained blood smears show piroplasm in the red cells, up to 80% of which may be parasitized (Soulsby, 1986). In cases of treatment against haemoprotozoal diseases common drugs was oxytetracycline that was followed by (Radostits et al, 2000).In my placement time mostly used drugs was bupervacaine in anaplasmosis and theileriosis in India which support the used in treatment purposes of those diseases. (Roy *et al.*, 2004).

Diagnosis of Myiasis is made on the basis of wound history, close examination of wound, characteristic odor, and brownish exudation from the wound and demonstration of maggots (Blood and Holstein, 1983)and its treated by clipping the wool or hair, removal of larvae and local dressing of wound with oil of turpentine on alternate days and intramuscular administration of combined penicillin. Another treatment regime consisted of single subcutaneous administration of ivermectin (0.2 mg/kg body weight) and combined penicillin and streptomycin daily for 7 days which produced recovery of 94% wound depth and 90% wound area. In case of wound dressing with tincture of iodine on alternate days and parenteral administration of combined penicillin and streptomycin resulted in healing of 78% wound depth and 36% wound area (Rahman *et al.,* 2009).

Ticks comprise and larval infestations a burning veterinary problem because they transmit diseases, induce paralysis or toxicosis and cause physical damage to livestock. (Rajput, 2005). Despite good genetic potentiality, most dairy animals in Bangladesh have considerably low quantity of milk due to lack of disease control. As a veterinarian it’s too important for me to know the prevalence of those diseases in different places and effectiveness in production and contrarily to take necessary steps for prevention and control. Therefore, epidemiological study should be undertaken to investigate present status of blood parasites in cattle, buffalo and fly infestation in different species in Bangladesh and India. Considering the above mentioned facts, the present study was conducted with some objectives.

**Objectives of the study:**

* To know the distribution of haemoprotozoal diseases and Myiasis in different animals by internship placement.
* To describe clinical signs and treatment of different clinical cases.

**Chapter-II**

**Materials and Methods**

**Internship placements and Study period:**

Ishwarganj Upazila Veterinary Hospital, Mymensingh and Tamil Nadu in India were the placement for studying clinical cases in different livestock species during 3 months in 2014.Clinical cases were investigated during February to April 2014 in Ishwarganj Upazila Veterinary Hospital in Mymensingh and during Jun to July 2014 in India.

**Data Collection:**

Using structured record keeping sheet the following information were recorded: Species, breed, age, sex, body weight, clinical sign of different cases and drugs prescribed in those diseases.

**Assessment of Cases:**

Cases were evaluated by taking rectal temperature, observing mucous membrane, palpating lymphnode and observing the presence of ticks, maggot and urine color.

**Statistical Analysis:**

Data obtained were stored and cleaned in the Microsoft Excel programme 2007 and then exported to STATA-13(College Station, Texas 77845, USA) for statistical analysis. Descriptive analysis was performed on the data of clinical cases according to different variables. Descriptive analysis was also done on clinical sign and physical inspection of different clinical cases. Results were presented as frequency number and percentage.

**Chapter III**

**Result and Discussion**

**Distribution of different clinical cases:**

A total of 26 clinical cases of different livestock species was examined during the study period of which 4 cases were babesiosis(3 UVH,Bangladesh&1 India),5 cases were anaplasmosis in India,6 cases were theileriosis in India and 11 cases were myiasis(10 UVH ,Bangladesh and 1 India)(Table-1).

**Table 1:** Distribution of different clinical cases according to livestock species & internship placements in 2014

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Species (Scientific name) Species (Scientific name)  Species (Scientific name) | Clinical diagnosis and placement | | | | | | total  Total |
| Babesiosis  (*Babesia bovis)* | | Anaplasmosis  (*Anaplasma marginale*) | Theilerosis  (*Theileria anulata*) | Myiasis  (*Lucilia cuprina*)  (*Chrysomyia bezziana)* | |
| Site | UVH | INDIA | UVH | INDIA | UVH | INDIA |  |
| Buffalo |  |  |  | 2 |  |  | 2 |
| Cattle | 3 | 1 | 5 | 4 | 5 |  | 18 |
| Dog |  |  |  |  |  | 1 | 1 |
| Goat |  |  |  |  | 3 |  | 3 |
| Sheep |  |  |  |  | 2 |  | 2 |
| Total | 3 | 1 | 5 | 6 | 10 | 1 | 26 |

UVH=Upazila veterinary hospital

**Clinical signs recorded in different clinical cases**

Coffee colored urine and swollen lymphnode were commonly observed in babesiosis,Swollen pre-scapular lymphnode was observed in anaplasmosis.In case of theileriosis swollen lymphnode and appearance nodules across the surface of the body were observed, wound along with maggot infestation was observed in myiasis.(Table-2).

**Table 2**: Clinical signs recorded in different clinical cases of animals.

|  |  |  |  |
| --- | --- | --- | --- |
| Clinical diseases | N | Types of clinical signs | Frequency of  clinical signs |
| Babesiosis | 4 | Coffee colored urine, swollen lymph node, high temperature and anemic (pale mucous membrane) | 3 |
|  | Coffee colored urine, swollen lymphnode and anemic | 1 |
| Anaplasmosis | 5 | Swollen lymphnode (pre-scapular), pale mucus membrane of eyes and fluctuating body temperature (sub-normal followed by high temperature) | 4 |
|  | Swollen lymphnode ( pre-scapular) and pale mucus membrane of eyes | 1 |
| Theilerosis | 6 | Swollen lymphnode and developed nodules over the body surface | 6 |
| Myiasis | 11 | Presence of wound with maggot infestation | 11 |

**Drugs prescribed against different clinical cases of animals**

Oxytetracycline was the common treatment for all protozoal clinical cases. Recorded treatment for myiasis was povidine iodine, naphthalene and sulphanilamide powder. These drugs were applied after removal of maggots by using oil of turpentine and forceps. (Table-3)

**Table-3:** Drugs prescribed against different clinical cases of cattle, goats and other animals.

|  |  |  |  |
| --- | --- | --- | --- |
| Clinical cases | Drugs prescribed (Group) | Doses and duration | n |
| Babesiosis | Oxytetracycline (Tetracycline) | 25 mg/kg b.wt,7days | 3 |
| Diminazine aceturate ,Hematonic mixture | 3.5mg/kg bwt, single dose |
| Oxytetracycline, saline | Saline 500 ml/large animal | 1 |
| Anaplasmosis | Oxytetracycline and Saline, Bupervacaine | Oxytetracycline-25mg/kg b.wt-5days  Bupervacaine-2.5mg/kg bwt-single dose  Saline-1000ml/large animal | 5 |
| Theilerosis | Oxytetracycline and Bupervacaine ,Saline | Oxytetracycline-25mg/kg bwt-5 days  Bupervacaine-2.5mg/kg bwt-single dose  Saline-1000ml/large animal | 6 |
| Myiasis | Povidine Iodine, naphthalene |  | 8 |
| Naphthalene, sulphanilamide powder | Ivertin-0.2mg/kg bwt, single dose | 2 |
| Oil of turpentine, ivermectin |  | 1 |

Mg =Milligram; Bwt=Body Weight

**CHAPTER IV**

**Discussion**

In the present study the haemoprotozoal infections in cattle was 13% (n=15) where Babesiosis, Anaplasmosis and Theilerosis was 4%, 3% and 4% respectively. The sub-clinical Anaplasmosis infection in cattle of Bangladesh is 5.93% (Samad *et al.*, 1989) which is higher than the findings of this study. Among hemoprotozoan diseases babesiosis and anaplasmosis are more prevalent in different areas of Bangladesh whereas Samad *et al*., (1989) recorded the highest 14.53% babesiosis and Chowdhury *et al*., (2006) recorded 70% anaplasmosis in Sirajgong district. In case of cattle species major cases were cross breed cattle in India that supports the report (Chakraborti *et al.*, 2002) witnessing animals are highly affected by haemoprotozoan diseases in cross-breed animals in India. Among all protozoan cases in cattle higher (10%) percentage was in Tamil nadu of India (n=13) where 21.1 % haemoprotozoal disease has been previously reported from various geographical regions of the country in Tamil nadu (Anandan, Lalitha et al, 1989). In cattle species Myiasis infestation was 5% (n=11) which is slight higher than the earlier report of Omith *et al.,*( 2007); who reported 2.67% and less than Rahman *et al* (1972); who reported 11% incidence. In case of goat and sheep it was respectively 3% and 2% that also slight higher than the earlier findings that are 2.67% (Omith *et al.,* 2007). Overall myiasis cases in cattle, goat and sheep was 5%, 3% and 2% respectively.

Among haemoprotozoal diseases a common clinical sign was Coffee colored urine and swollen lymphnode in babesiosis, swollen pre-scapular lymphnode in anaplasmosis. In case of theileriosis swollen lymphnode and appearance nodules across the surface of animal body that supports to Urquhart (1996). Again in case of myiasis common clinical sign was wound along with maggot infestation which supports the earlier findings (Samad *et al.*, 1989). In cases of treatment against haemoprotozoal diseases common drugs was oxytetracycline (Radostits *et al.,* 2000). In my placement time mostly used drugs was bupervacaine for anaplasmosis and theileriosis in India (Roy *et al., 2*004*)*.

# Chapter V

**Conclusions**

From this study, it might be concluded that common clinical cases was haemoprotozoal diseases (Babesiosis, Anaplasmosis and Theilerosis) and Myiasis in internship placement time at UVH and India. Common clinical signs for Babesiosis were Coffee colored urine and swollen lymphnode whereas swollen pre-scapular lymphnode was found in anaplasmosis. Again swollen lymphnode and appearance of nodules across the body surface was found in Theileriosis. A myiasis case was identified by the presence of wound along with maggot infestation. According to treatment purposes common drug was oxytetracycline in all haemoprotozoal diseases (*Babesiosis, Anaplasmosis and Theileriosis*). Sometimes bupervacaine was used in both anaplasmosis and theileriosis especially in India. In case of Myiasis common treatment was removal of maggots and application of povidine iodine, naphthalene and ivermectin. This is the strategy for controlling ticks and flies of livestock in the studied areas of Bangladesh and India as well.

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