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ADDIS ABABA UNIVERSITY

COLLEGE OF VETERINARY MEDICINE AND AGRICULTURE

DEPARTMENT OF CLINICAL STUDIES

CLINICAL CASE REPORTS ON SELECTED DISEASES OF VETERINARY IMPORTANCE ON DIFFERENT DOMESTIC ANIMALS IN AND AROUND BISHOFTU TOWN, EAST SHOA ZONE, OROMIA, ETHIOPIA

MVSC THESIS

BY

GISHU BERISO TUFA

AUGUST, 2021

BISHOFTU, ETHIOPIA

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A Thesis Submitted to the College of Veterinary Medicine and Agriculture of Addis Ababa University in partial fulfillment of the requirements for the degree of Master of Veterinary Science in Veterinary Clinical Medicine

BY

GISHU BERISO TUFA

DEPARTMENT OF CLINICAL STUDIES

POST GRADUATE PROGRAM IN MASTERS OF VETERINARY CLINICAL MEDICINE

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AUGUST, 2021

BISHOFTU, ETHIOPIA

Approval Sheet

Addis Ababa University

College of Veterinary Medicine and Agriculture

Department of Clinical Studies

As MVSc research advisor, I hereby certify that I have read and evaluated this Thesis prepared under our guidance by Gishu Beriso entitled "**CLINICAL CASE REPOTS OF SELECTED DISEASES OF VETERINARY IMPORTANCE ON DIFFERENT DOMESTIC ANIMALS IN AND AROUND BISHOFTU TOWN, EAST SHOA ZONE, OROMIA, ETHIOPIA**", we approved for submittal to dissertation assessment committee.

Submitted by: Gishu Beriso Tufa _____ 12/08/2021

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As member of the examining board of the final MVSc open defense, we certify that we have read and evaluated the thesis prepared by Gishu Beriso Tufa entitled **"CLINICAL CASE REPORTS OF SELECTED DISEASES OF VETERINARY IMPORTANCE ON DIFFERENT DOMESTIC ANIMALS IN AND AROUND BISHOFTU TOWN, EAST SHOA ZONE, OROMIA, ETHIOPIA",** and recommended that it be accepted as fulfilling the thesis requirement for the degree of Masters of Veterinary science (MVSc) in Veterinary Clinical Medicine.

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DEDICATION

I dedicated this thesis manuscript to my father Beriso Tufa, who passed away during my childhood time. He was the source of my mirror images, strong arm to my spirit, exemplar guider to my life and our family at all. Tears never compensate your loss and I lost everything of mine and hence, my mind would remain in a broken heart. All his memories will remain in my heart as long as God let me live.

STATEMENT OF THE AUTHOUR

First, I declare that this thesis is my genuine work for which all sources of materials used in this thesis are punctually acknowledged. This thesis has been submitted in partial fulfillment of the requirements for the degree of Master of Veterinary Science in Veterinary Clinical Medicine at Addis Ababa University, College of Veterinary Medicine and Agriculture and is deposited at the University/College library to be made available to borrowers under rules of the Library. I solemnly declare that this thesis isn't submitted to any other institution anyplace for the award of academic degree, diploma, or certificate. Brief quotations from this thesis are allowable without special permission provided that accurate acknowledgement of source is made. Requests for permission for extended quotation from or reproduction of this manuscript in whole or in part may be granted by the head of the major department or the dean of the college when in his or her judgment the proposed use of the material is in the interests of scholarship. In all other instances, however, permission must be obtained from the author.

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LIST OF ABBREVIATIONS

AAU	Addis Abeba University
CaPV	Capri Pox Virus
CPV	Canine parvovirus
CTVT	Canine Transmissible Venereal Tumor
CVMA	College of Veterinary Medicine and Agriculture
Ecoli	Escherichia Coli
EHEC	Enteroheamorrhagic Escherichia Coli
EIEC	Entero Invasive Escherichia Coli
EL	Epizootic Lymphangitis
EMB	Eosin Methylene Blue
ETEC	Entero Toxigenic Escherichia Coli
FAD	Flea allergy Dermatitis
GPV	Goat Pox Virus
LSD	Lumpy Skin Disease
LSDV	Lumpy Skin Disease virus
MCF	Malignant Catarrhal Fever
NVI	National veterinary Institute
OIE	Office International des Epizooties
PCR	Polymerase Chain Reaction
PCV	Packed Cell Volume
PPR	Pest des petites Ruminant
PPTV	pest des Petites Ruminant
RBC	Red Blood Cell
SGP	Sheep Goat Pox
SPANA	Society for the protection of the Animal Abroad

SPV	Sheep Pox Virus
TSI	Triple Sugar Iron
VTH	Veterinary Teaching Hospital
XLD	Xylosine Lysine Deoxycalete

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ABSTRACT

Ethiopia is known for its highest livestock resource worldwide; however, the benefits obtained from the sector are disproportional due to various factors. The livestock disease is among the principal constraints that hinder productivity either through morbidity or mortality of animals. Although there are no standardized diagnoses or treatment protocols to follow, veterinary health centers in Ethiopia have been handling plenty of clinical cases daily. Thus, these case reports were compiled to provide diagnosis and treatment approaches of various diseases in different species of animals brought to Veterinary Teaching Hospital and SPANA Ethiopia of CVMA from Bishoftu and its vicinity. Young and adult animals with different physiological stages and sexes were examined from December 2020 to June 2021. The clinical case handling began with the owner's complaint followed by a physical examination; then, tentative diagnosis and treatments were prescribed after samples were collected for further laboratory confirmations to continue or change the first therapy and recommend control and prevention measures. The animals were then followed until they fully recovered either at the clinic during the subsequent therapy or at their home. A total of 21 animals were examined of these, 7(33.3%) were cattle, 5(23.8%) goats, 4(19.1%) dogs, 3(14.3%) sheep, 1(4.8%) horse, and 1(4.8%) chicken. Of these, 15 (71.4%) were fully recovered, while 5 (23.8%) died and 1(4.8%) was euthanized. Livestock diseases with various causes including viruses, bacteria, parasites, and plant poisoning were handled. Out of these, viral diseases were the most frequently encountered followed by a bacterial disease. During this work, challenges from the owner's side and unavailability of drugs, health centers, and inpatient facilities were encountered. These had directly or indirectly affected the treatment outcomes of the cases. Therefore, based on the findings, creating awareness to the livestock owners, establishing animal health centers near them, and consulting suppliers to import drugs with remarkable therapeutic effects were recommended to lessen animals and economic losses of diseases.

Keyword: *Animals, Bishoftu, Case report, Case management, Laboratory finding, Treatment*

1. INTRODUCTION

In Ethiopia, agriculture is the mainstay of the country and also the major resources of employment and income, about 80% of the population live in the rural areas and are primarily engaged in agriculture and related activities. Thus, agriculture directly or indirectly forms an important component of the livelihood of more than 60 million people in the country. In Ethiopia, livestock contribute about 30%-35% of the agricultural Gross Domestic Product (GDP) and more than 85% of farm cash income (Brown, 2003).

Ethiopia has the largest livestock inventories in Africa, including more than 70 million cattle, 42.9 million sheep, 52.5 million goats, 2.15 million horses, 10.80 million donkeys,0.38 million mules, and 57 million poultry population with livestock ownership currently contributing to the livelihoods of an estimated 80% of the rural population (CSA, 2020/21). Despite these huge livestock resources, its contribution for growth and development of national economy is limited. The sector contributes only 30%-33% of Agriculture gross domestic product. Different factors or constraints limit the full exploitation of in general and agricultural sector in particular in the country. More over such constraint pronounced in mixed crop livestock dominant highland parts where the human population gowth and natural resource degradation are critical. The major constraints are inadequate feed both in quantity and quality, wide spread disease, poor genetic potential and inappropriate livestock policy affecting the performance of subsector(Menbere, 2014; Win and Tu, 2019).

Among these constraints, diseases have numerous influences on productivity and fertility of herds. The effect of livestock disease could be expressed interms of loss of animal due to death and disease, loss of production, reduction of growth rate, poor fertility performance and decrease physical power(Kali, B and Ali, 2016). Various bacterial, viral, protozoal, endoparasites and ectoparasites are frequently encountered livestock diseases all over the country and accounts for the momentous economic losses. Despite a number of diseases affecting productivity of the livestock sector, 40% of the national economy is still tuned on livestock agriculture; however potential and productivity of the sector stays inversely related (FAO, 2019). Despite most of these diseases are curable and manageable, there is an action

taken that can goes with the standard protocol. For satisfactory action to be taken appropriate diagnostic measure to identify the disease and extent of damage happened as well as appropriate treatment and management procedures are highly recommended.

Therefore, the objective of this case study was:

- ✓ To study major veterinary importance diseases brought to animal health care facilities of Addis Ababa University, College of Veterinary Medicine and Agriculture from Bishoftu and its vicinity.
- ✓ To treat and follow each case and to investigate the treatment outcome.
- ✓ To identify cause of treatment failure
- ✓ To give appropriate recommendation based on the study finding

2. MATERIAL AND METHODS

2.1. Study area

The study was conducted from December 2020 to June 2021 on veterinary clinical cases at animal health facilities center in and around bishoftu, central Ethiopia (VTH, SPANA). Bishoftu is located 45kms south east of the capital of Ethiopia, Addis Ababa. It is situated at latitude of about 9° north and longitude of 4° east. The city lies at an altitude of 1850 meters above sea level in central high land of Ethiopia. The area has three distinct seasons, namely main rain, short rain and dry seasons. Based on weather data, the mean annual rainfall of the area is 866 ml with mean minimum and maximum temperatures of 14oC and 26 0C, respectively, with mean relatively humidity of 61.3%. Farmers in the vicinity of Bishoftu town use a mixed crop and livestock farming system (NMSA, 2006).

2.2. Study Design and Study Population

A descriptive case study was used in this study. Purposive sampling technique was used on animals cames to the clinics. Different animals with different species (bovine, equine, ovine, caprine, poultry and pets), age group and different sex group were included in this study. This case study was undertaken at animal health facilities center in and around bishoftu, central Ethiopia, to report important encountered clinical diseases and disorders in livestock during the study period from December 2020 to June 2021 with a detailed report and description of species, parameters, the symptoms, diagnosis, treatment, and follow-up of individual patient animals was done.

2.3. Case handling protocol

Clinical case recording format (Addis ababa university) and clinical case handling protocol (Jana and Ghosh, 2013) was used in this case study as indicated in Annex part (Annex 1 and Annex 2) respectively.

2.3.1. History taking/anamnesis

Disease problems in veterinary medicine are invariably presented to the clinician through the medium of the owner‟s complaint, which is a request for professional assistance. Owner is the best link between clinician and patient animals, so appropriate anamnesis are very important in disease diagnosis. For completeness and accuracy of history taking, the following points should be well considered (Patient data, Immediate/present history, past history, Management and Environment history) and history of each case was carefully taken which gave a guideline for examination of the animals (Duguma, 2016).

2.3.2. Physical and General Examination

Physical condition, behavior, posture, gait, superficial skin wound, prolapsed of the uterus and vagina, salivation, nasal discharge, distension of the abdomen and locomotive disturbance were observed by visual examination of the patient. Examination of different parts and system of the body of each of the sick animals were examined by using procedure of palpation, percussion, auscultation, needle puncture and walking of the animals. The temperature, pulse, and respiratory rate from each of sick animals were recorded. Clinical examinations of all livestock of different ages were conducted on the basis of diseases history, owner complaint, symptoms, to diagnose diseases and disorders (Kabir *et al*., 2010).

3. COMPILED AND REPORTED CLINICAL CASES OF ANIMALS

3. 1. Canine Babesiosis in a German shepherd

Abstract

Canine babesiosis is tick born protozoal disease, caused by two types of babesia species which are large babesia (*B.canis, B.vogelli, and B.rossi*) and small babesia (*B.vulpes, B.gibsoni and B.conrada*). A German shepherd dog was brought to VTH-CVMA with a history of decreased feed intake, weakness, and bloody urine. The dog was febrile (41^0C), lethargic, and had a congested mucus membrane on physical examination. Tick species were also discovered on the dog's perianal regions and scrotum. The laboratory results including peripheral blood smear, PCV value, and urine sedimentation test and other findings such as presence of tick on different body parts of the dog and clinical pictures indicated that the dog was suffered from babesiosis. Diminazine aceturate 3.5mg/kg, IM, with a repeat dosage fifteen days following the initial injection, was used to manage the case. After receiving the second therapy, the dog gradually recovered. Hence, early diagnosis and opportune treatment with appropriate drug can cure babesiosis. It is highly recommended to control tick through the use of acaricide and removing while observing the attached tick on the dog.

Keyword: *Babesiosis, Dog*

Introduction

Babesiosis is a tick born hemo-protozoal disease, which occurs in the southern USA, central and South America, Africa, Asia and Europe. Babesia species infects a wide variety of vertebrate; however the species of babesia infecting different animal species are specific for that animal species(Hordofa and Adugna, 2017).

Babesiosis is characterized by fever, lethargy, hemoglobinuria, heamolytic anemia and death when animal not treated early. Based on morphology, two types of canine babesia infect

dogs. Large babesia includes *Babesia vogeli, Babesia canis* and *Babesia rossi;* whereas small babesia includes *Babesia gibsoni, Babesia vulpes* and *Babesia conrada*. The erythrocytic stage merozoite of large and small babesia is 2-2-5 * 4-4.5 and 1*3 respectively. In the red blood cell the merozoite and trophozoite stage of large and small babesia forms ring shape and pyriform bodies respectively. The geographical distribution of babesia depends on the tick species found on the area, animals' movement and others. *Babesia vogelli* is the most prevalent species worldwide, *Babesia canis* found predominantly in Europe, *Babesia rossi* in Africa and small babesia are found in Asia(Dubova *et al.,* 2020).

Babesiosis transmitted mainly through a tick, but other methods of transmissions are in-utero and through blood transfusion(Associations, 2019)(Adaszek *et al.*, 2016). The ixodid (hard tick) vector is the major transmitter of the disease. The tick species from genera Hylomma, Rhipicephalus, Dermacentor, hemaphysalis and ixodes transmite canine babesiosis(Swamy *et al.,* 2019). During feeding on vertebrate hosts ticks transmit the sporozoites to the red blood stream where they differentiate into trophozoites. The trophozoites are then multiplied by binary fission into two or four merozoites, leave the red blood cell by destructing them. Multiplication and invasion new RBC of the merozoites continue till the death or the animal is being treated(Buczek, 2021).

In addition some of the merozoites are transforming in erythrocyte into pre gametocyte, which is ingested by tick feeding on infected host. In the tick it invades different tick organs, salivary gland where the final multiplication and differentiation occur to form sporozoite that can infect vertebrate host while tick feeds on and ovaries. In the tick the parasite has both transovarial and trans-stadial transmission(Petra *et al.,* 2018). The pathogenesis and clinical signs of babesiosis depends on the age of the host animal, immune status and species babesia infecting. The disease presentation differs from peracute to chronic or subclinical. Clinical signs include pale mucous membranes, lymph node enlargement, depression, tachycardia, tachypnoea, anorexia, weakness, splenomegaly and fever. These clinical signs are developed due tissue shortage of oxygen that occur concurrently with of destruction red blood cells and inflammatory response indicated by cytokines release (Schoeman, 2009).

Diagnosis of acute cases infected with *B. canis* is based on the classic clinical presentation and the demonstration of the parasites within red blood cells on Diff-quick stained, thin capillary blood smears. The large babesias are typically seen as paired, 2.4 x 5 µm-sized bodies, although some red blood cells can contain up to 6–8 pyriform to round bodies. However, detection of small babesia requires good staining technique and considerable practice on that they are found as single annular bodies measuring 1*3.2 µm.

Case description

A two-year's-old Germen shepherd breed dog was presented to AAU-CVMA-VTH, Bishoftu with the history of decreased feed intake and bloody urine. The owner also told that he has removed a tick (mezheger) from the neck area of the dog before two days. On clinical examination the dog was febrile with body T^0 of 40.5^0C, hyperpnea and tachycardia (140 heart beats per minute). The dog was dehydrated, lethargic and with pale mucous membrane and there were tick on the scrotum and under the belly of the dog as indicated in the figure 2 below. Based on history, presence of tick on dog and clinical findings the case was tentatively diagnosed as canine babesia.

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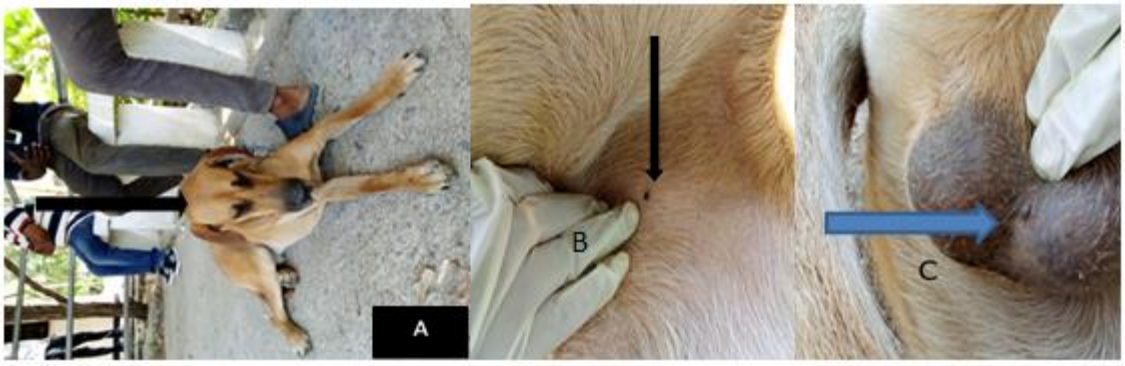


Figure 1: lethargic dog (A) and tick on scrotum and under belly (B and C)

Laboratory investigation and finding

A blood sample was obtained, and a thin blood smear stained with giemsa stain and PCV determination was done to achieve a confirmatory diagnosis. A ring-like material (Babesia canis (large babesia)) was observed in the red blood cells of the dog under X100 objective lens, with a low PCV result of 22 as shown in figure 3 below. As a result, this finding confirmed that the dog had babesiois.

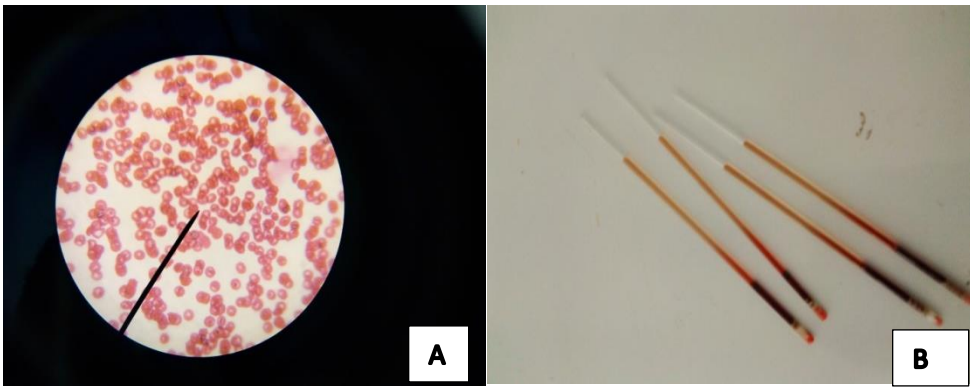


Figure 2: Blood smear result indicating *Babesia canis* in the red blood cells (A) and reduced

PCV result (B)

In addition the tick find on the scrotum and under the bully of the dog was identified as the nymphal stage of Rhipicephalus as indicated on figure below

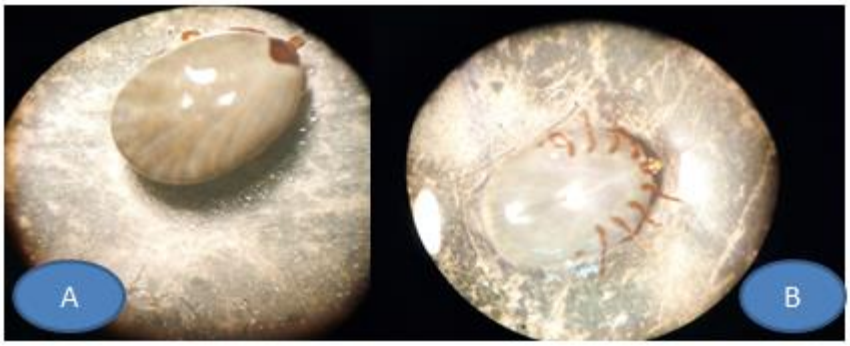


Figure 3: Dorsal view of nymphal stage of Rhipicephalus tick (A) and ventral side (B)

Case management and treatment outcome

Based on the laboratory result, the dog was treated with one shot diminazine aceturate ((Diminol, Korea) at a dose of 3.5mg/kg IM and dextrose (DNS) on the first day. A week after first treatment, the dog's appetite returned and the clinical signs were reduced but the dog was not fully recovered. Again a second shot with diminazine aceturate (Diminol, Korea) at dose of 3.5mg/kg IM was done after two weeks of the first therapy and the dog was fully recovered (figure 4).

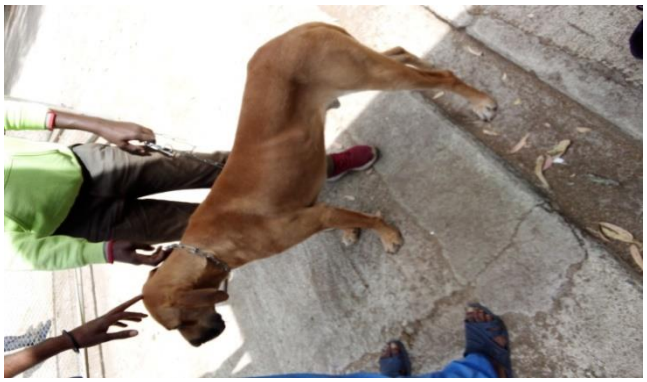


Figure 4: Recovered dog from babesiosis

Discussion

The present case of was diagnosed as canine babesiosis based on clinical findings and laboratory results. There are various diagnosis methods for babesia in infected animals. Detection of the parasite in the blood smear, immune-fluorescent antibody test and molecular test such as polymerase chain reaction (PCR). Microscopic examination of blood smear and immunofluorescent antibody test are known to have limitation in that it lacks sensitivity and enable us to differentiate morphology of different species of babesia and cross reactivity between different species of babesia (Taylor et al., 2000). In this case, the dog was treated with diminazine aceturate and produced satisfactory outcome, the treatment protocol used in this case is similar with (Sivajothi et al., 2014) who has done two cases of babesiosis in which one of the case was died whereas the other recovered. In addition, similar diagnostic procedure was applied, which means peripheral blood smear was applied and piroplasmic bodies were found in red blood cells (RBC's).

In conclusion, canine babesiosis is tick born protozoal disease affecting canine species. The parasite mainly transimitted by different species of ticks; thus, controlling the vector can minimize the occurrence of the disease, especially during autumn and spring season of the year through the use of acaricides. It is important to remove the attached ticks as soon as noticed to prevent the infection before maturation and transmission of infective parasite sporozoites via saliva.

Acknowledgement

My appreciation and great thanks goes to Addis Ababa University college of Veterinary medicine, Veterinary Teaching Hospital staff, in particular Dr. Cheru Talila.

3.2. Collibacillosis in a Calf

Abstract

Collibacillosis is the primary cause of calf diarrhea that leads to mortality due to septicemia. A 20-day-old exotic breed calf with a history of refusing to eat and feces that were runny

and bloody was brought to CVMA-VTH. The calf was carefully handled and kept apart from its dam while being fed milk. The calf was lethargic, unable to stand and dehydrated. There was also dysentery and a pale mucous membrane. The calf's body temperature was 37.5 degrees Celsius, with a heart rate of 76 beats per minute and a respiratory rate of 48 breaths per minute. Fecal samples were collected and submitted to a laboratory for parasitological and microbiological examination. The parasitological fecal flotation technique revealed no coccidian/emm egg or other protozoal cysts, but bacteriological culture and biochemical test confirmed that the calf had *E. coli*-caused colibacillosis. The calf was managed with ringer lactate, sulfonamides at dose of 1ml/16kg for five consecutive days and dexamethasone 0.2mg/kg/day for three consecutive days. After five days, the calf was completely recovered and back to normal status. Hence, collibacillosis is a management related disease that results in huge economic loss in dairy and beef cattle through mortality and morbidity of growing calf. Thus, adhering to sanitary practice and providing adequate colostrum to new-born can help to minimize the risk of colibacillosis.

Keyword: *Calf, Collibacillosis, Sulfonamides*

Introduction

Collibacillosis is the first mentioned cause of calf diarrhea that result in death due complication of septicemia. There are several pathogens those results in severe diarrhea in calf of which Escherichia coli, salmonella, clostridium perifrenges, corona virus and cryptosporidium are the most common once (Shams *et al.*, 2012)(Henderson, 2011).

Escherichia coli is the normal flora of gastrointestinal tract of animals, but there are certain strains which are pathogenic. In addition ecoli is found in the soil, water bodies and also in human feces. There are two different forms of the disease: enteric colibacillosis is characterized diarrhea/ dysentery, dehydration, acidosis, and death in a few days if not treated; coliform septicemia is characterized by severe illness and rapid death in several hours Septicemic colibacillosis occurs in newborn animals that are agammaglobulinemic because they have not ingested sufficient colostrum early enough, or have absorbed insufficient colostral immunoglobulins, thus rendering them highly susceptible (Lotfollahzadeh, 2015).

Pathogenic ecoli is divided into six pathotypes based on the virulence of each pathotypes. Enterotoxigenic ecoli (ETEC), enterohemorrhagic ecoli (EHEC), enteroaggregative ecoli (EAEC), enterinvasive ecoli (EIEC), enteropathogic ecoli(EPEC)and diffusely adherent ecoli (DAEC)(A.Islam, Rahman *et al.*, 2013).

Transmission is most often through oral-faecal route by ingestion of contaminated feed and water, however infection through umbilical vein and nasopharyngeal were believed to occur in certain serotypes of E. Coli. Diagnosis of colibacillosis is based on history and clinical findings, enzyme linked immunosorbent assay (ELISA) and DNA gene probes specific for genes encoding enterotoxin. The definitive etiological diagnosis of colibacillosis depends on the isolation and characterization of the E. Coli(Shams *et al.*, 2012).

Treatment of collibacillosis requires intensive antibiotic treatment along with intravenous fluid and anti-inflammatory drugs. Antibiotic agents such as oxytetracyccline, sulfachlorpyridazine, sulfamethoxazole, streptomycin, kanamycin and ciprofloxacin were reported to be effective for treatment of Ecoli. However for some drugs (penicillin, ampicillin, amoxycillin and bacitracin) Ecoli is resistant(Netsanet Tadesse, 2020). Prevention and control of collibacillosis in calf rely on proper management of the stock through good sanitary condition of the calf environmental and provision of enough colostrum(Bashahun and Amina, 2017). The following case report on collibacillosis in calf and management outcome.

Case description

A 20-day-old exotic breed calf was brought to AAU CVMA VTH with a history of refusing to eat and feces that were runny and bloody. The calf managed intensively and kept separated from its dam and feed milk. The calf was lethargic, unable to stand and dehydrated. In addition there was dysentery and pale mucus membrane. Physical examination revealed the body temperature of 37.5^0C, with 76beats/min, and 48 breaths/min heart and respiratory rate, respectively. The case was tentatively diagnosed as collibacillosis

Figure 5: Recumbent calf with bloody diarrhea

Laboratory examination and result

For confirmatory diagnosis of the case fecal sample was collected and brought to parasitology and microbiology laboratory in CVMA. At parasitology laboratory fecal floatation procedure was performed to diagnose coccidia egg or other protozoal cyst, however the result was negative. At microbiology laboratory, bacteriological examination was done. First the sample was cultured on XLD media to get either characteristic colony of salmonella or ecoli. On XLD yellowish colony with yellowish background was obtained, this is helpful to rule out as the pathogen was not salmonella. Then pure colony was taken from XLD and cultured on sorbitol macConkey agar, pink colony was obtained, indicating the bacteria is but not *O157 Ecoli*. From *macConkey* it then cultured on ethyl methyl blue (EMB) media and metallic shean colony was obtained. Biochemical tests citrate, indole and TSI were done and the results were negative, positive and ferment all sugar and no production of H_2S, respectively. The laboratory results strongly indicate the causative agent of dysentery for present case is *Escherichia coli.*

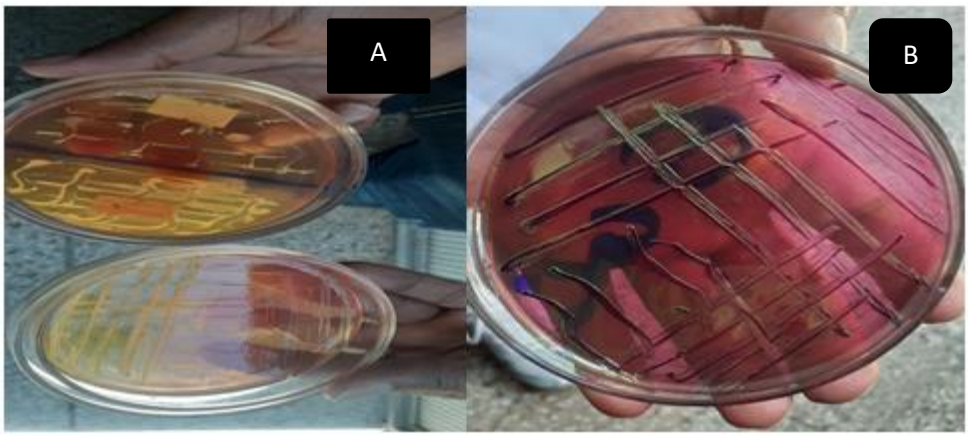


Figure 6: yellowish colony of ecoli on sorbitol macConkey (A) metallic shean colony of ecoli on EMB (B)

Case management and outcome

Since the calf was highly dehydrated, ringer lactate (Addis Pharmaceutical factory PLC) was instituted IV, daily for three consecutive days. Sulfonamide ((Hebei Yuanheng Pharmaceutical Co., Ltd, China) at dose of 1ml/16kg for five consecutive days and dexamethasone (Sokar Healthcare Pvt.Ltd. Gujarat India) 0.2mg/kg/day for three consecutive days were given IM. At the end of therapy (after five days), the calf was completely recovered and back to normal status as indicated in the figure below.

Figure 7: recovered calf from collibacillosis

Discussion

Collibacillosis is a bacterial disease that causes severe diarrhea in growing calves. The disease has significant economic loss in dairy and beef cattle through morbidity and mortality of younger calves (Lotfollahzadeh, 2015). E coli can cause either diarrhea or septicemia in very young calf. Septicemic collibacillosis occur due to lack of agammaglobinimia which result from under feeding of colostrum and causes early death in young calf(Bashahun and Amina, 2017). The present case confirmed as collibacillosis based on history, clinical sign and age of calf.

There are different types of Ecoli pathotypes causing scouring in calf. Enterotoxigenic E coli (ETEC) is the most common pathotypes known to cause either diarrhea or septicemia. ETEC causes diarrhea which watery in very young calf less than three or four day, most commonly at fourthy eight hour age(Matsumoto *et al.*, 2020). The ETEC causes severe diarrhea by attaching on receptor of small intestine through its fimbriae without any structural deformation. Following attachement on the intestine of the host they secrete an enterotoxin that affects absorption of fluid and electrolytes and results in diarrhea (Shams *et al.*, 2012). EHEC is strain of ecoli known by production of shiga toxin and harbored by calves' intestine during outbreak causes dysentery in very young calf at age of one to five week old. The strain is capable of adhering, damaging intestinal mucosa and producing a toxin that induce dysentery (A.Islam, Rahman *et al.*, 2013).

The present case of dysentery was caused by *E.coli* as confirmed by bacteriological culture, even though the strain of *E.coli* is not identified due to lack of reagent for different biochemical tests. However, several authors wrote dysentery in very young calf (1 to 5 week) age is caused by *Enterohemorrhagic escherichia coli* (EHEC).

Collibacillosis can be treated with antibiotics such oxytetracycline, chloramphenicol, neomycin, and ampicillin, along with various sulphonamides and nitrofurans are in common use. However, different authors reported that the bacterium developed resistance to some of these drugs (sulphonamides, tetracycline and ampicillin). There are various symptoms developed by the pathogen in diseased calf due various strains cause different mechanism of pathogenesis this calls for using a drug that is effective for both local and systemic infection.

In conclusion collibacillosis is the management related disease that results in huge economic loss in dairy and beef cattle through mortality and morbidity of growing calf. Prevention and control of collibacillosis depends on maintaining the hygienic and sanitary condition of calf along with feeding enough colostrum.

3. 3. Case report on canine parvovirus

Abstract

Canine parvovirus is a highly contagious viral disease that affects unvaccinated puppies. A five-month-old puppy was brought to Addis Ababa University's veterinary teaching hospital with a history of bloody diarrhea, vomiting, and reluctance to eat. On physical examination, the puppy's vital parameters were within the normal range, but had foul-smelling bloody diarrhea and was dehydrated. The case was tentatively diagnosed as canine parvovirus based on the history, clinical manifestations and age of the animal. The puppy was given supportive care that included fluid resuscitation, antiemetic, antibiotics, and analgesia. The puppy was subsequently monitored for a week, during which time gradual improvements were noted, and was fully revived a week later. Decontaminating the dogs' kennel and nearby surroundings, as well as an early hospital visit in case similar problem recur can reduce the effect of parvovirus.

Keyword: *Canine parvovirus, Puppy*

Introduction

Canine parvovirus is a highly contagious viral disease of young unvaccinated dog. The disease highly characterized gastrointestinal problems which manifested by vomiting, bloody diarrhea, and myocarditis and reduced white blood count (Polignano, 2019). Complications include fluid imbalance, electrolyte loss, metabolic acidosis, sepsis and disseminated intravascular coagulation. Myocarditis occurs in young puppies born from unvaccinated bitches either concurrently with enteric form or as separate clinical entity. The disease occurrence increases during the warmer season of the year (Polignano, 2019). Canine parvo virus transmitted via inhalation, ingestion of feed contaminated by excreta of

infected animal or indirectly through contaminated material by the feces of sick dog(Odueko, 2020).

Canine parvovirus is a single stranded non enveloped DNA virus belongs to genus *parvovirus*, family *parvov iridae.* Two genetically and antigenically distnict CPV are known; Canine Minute Virus or canine parvo virus type 1(CPV1) and canine parvo type 2(CPV2). Canine parvo type 1 is less pathogenic than type CPV2 and cause mild diarrhea, myocarditis, lymphadenitis and pneumonia. CPV1 can be prevented by maintaining environmental hygiene and avoiding overcrowding of dog in the kennel. However, CPV2 is simply known as parvo it is the most pathogenic variant and often the cause of serious fatal hemorrhagic enteritis especially in dog of less than one year age(Odueko, 2020). CPV2 found everywhere in the environment and resistant to common detergent and environmental desiccation, enabling the virus to stay longer in the environment and infect susceptible animals (dog) (Mylonakis, Kalli and Rallis, 2016). Recently CPV2 is replaced by CPV2a and CPV2b and additional most recently discovered CPV2c (Nivy *et al.*, 2011). CPV2a and CPV2b are known to have worldwide distribution and causing more severe disease(Sharma *et al.*, 2018).

The disease can be diagnosed based on clinical signs, history, laboratory tests and pathologic findings. Definitive diagnosis can be made by detection of viral antigen in the fecal sample by using immune sorbent assay (ELISA), viral genetic material detection using polymerase chain reaction, hematology which indicate leukopenia, lymphopenia, neutropenia, monocytopenia and biochemistry which indicates loss of protein (decrease albumin and globulin) and slight increase of liver enzyme(Firoozjaii *et al.*, 2011).

Canine parvovirus has no specific treatment but supportive care with fluid therapy, prevention of secondary bacterial complication with broad spectrum antibiotics, antiemetics and analgesia highly recommended for successful patient management(Judge, 2017). The overall fatality rate in untreated dog is 91% and the recovery in treated puppies is 96%. The most effective way of to prevent the disease is using commercially produced vaccine (modified life vaccine) and administration of serum from previously infected dog before the presentation of clinical signs in addition to good management (Mylonakis, Kalli and Rallis,

2016). Therefore the following case is on canine parvovirus in local breed dog and its treatment outcome.

Case description

A five month German shepherd puppy was brought to a veterinary teaching hospital of Addis Ababa University with the history of refuse to eat, drink, and bloody vomiting and diarrhea. The owner also said the condition started one day before presentation to the hospital and the puppy feed the head portion of sheep meat. Up on physical examination the puppy body temperature, respiratory rate and heart were found 39.5^{o}C per minute, 40 breathes per minute and 96 beats per minute, respectively below indicates the rear (ventral side of tail) soiled with bloody diarrhea and puppy defecating bloody diarrhea.

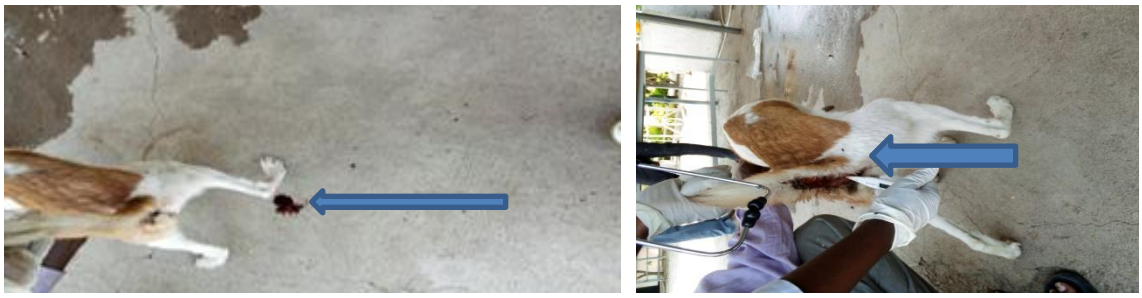


Figure 8: Dog with bloody diarrhea and increased body temperature indicated by arrow

Case management and treatment outcome

Because the puppy was dehydrated and had lost fluid and electrolytes due to vomiting and diarrhea, ringer lactate fluid (Addis manufacturer factory PLC, Ethiopia) was administered). As well as, antiemetic metoclopramide (10 mg/ml, route IM/IV, Jiangsu Pengyao Pharmaceutical Co., Ltd.) and gentamycin broad spectrum antibiotics for secondary bacterial complication (Humanwell pharmaceutical PLC, Ethiopia) were given intravenously for five days (gentamycin IV on the first day and IM on the remaining four days) and vitamin B-complex intramuscularly. The puppy was followed for the next four days with administration of the prescribed drug, however the owner was complaining signs doesn't subside and the puppy was refuse to eat during the three day follow-up. The puppy was again administered with vitamin B-complex and analgesics diclofenac sodium.

Figure 9: puppy resuscitated with fluid therapy

On the fourth day the puppy starts to consume and the symptoms were decreased and as indicated below (figure 10), week after treatment the puppy was recovered with normal appetite resumed.

Figure 10: recovered puppy from parvovirus

Discussion

The present case diagnosed based on history and clinical manifestation of the disease. The history of unvaccination of the puppy and age of the puppy are risk factors for contraction of the disease. The clinical signs observed on this case are bloody diarrhea, vomiting, and dehydration were the major findings suppose the case to call canine parvovirus. The disease clinical manifestation is similar to that of the stated by (Polignano, 2019), which stated the major clinical signs of CPV are diarrhea, vomiting, hematochezia, lethargy, anorexia and abdominal pain.

Even though definitive diagnostic method is highly recommended these method of diagnosis is supported by (Sharma *et al.*, 2018), (Odueko, 2020),(gentamycin) for secondary bacterial complication, antiemetic (metoclopramide) and analgesia (declofenac sodium) (to give relief for pain due to damaged intestine). This treatment protocol agree with different literature such as (Nivy *et al.*, 2011), (Mylonakis, Kalli and Rallis, 2016), (Kennedy, 2017), (Polignano, 2019), (Odueko, 2020).

In conclusion, canine parvovirus is a highly contagious viral disease of young unvaccinated dogs. The disease is characterized by bloody diarrhea, anorexia, and lethargy and vomiting. Vaccinating young dog at the age of three to four month is the most effective measure to control canine parvovirus. In addition, early treatment of the diseased animals by fluid therapy and broad spectrum antibiotics and control of the disease through good hygiene of feed and fomites are highly recommended.

3.4. Case on Laryngitis in local breed heifer

Abstract

Fusobacterium necrophorum is a Gram-negative, non-spore-forming, obligate anaerobic pleomorphic bacteria found in the gastrointestinal, respiratory, and reproductive systems of humans and animals. On May 21, 2021, AAU-CVMA-VTH received a two-year-old heifer with a history of irregular breathing and refusal to eat. The heifer was semi-intensively managed, according to the owner, and the problem began two days ago. Body temperature, respiratory rate, and heart rate of the heifer were all determined to be 40 degrees Celsius, 68 breaths per minute and 80 beats per minute, respectively. There were also enlarged retropharyngeal and pre-scapular lymph nodes, as well as a rough hair coat and forceful breathing (inspiratory stridor, a roaring sound heard from a distance). The heifer was given oxytetracycline at a concentration of 10% for five days and dexamethasone for three days. The first three shots of oxytetracycline were given intravenously, and the remainders were administered intramuscularly, while dexamethasone was given intramuscularly. Physical condition, parameters, and feed intake all improved gradually starting the next day after therapy. After fifteen days, the heifer was fully recovered and returns to its normal health

condition. Although avoiding sharp objects is essential in preventing the problem, animals that have already developed the disease should be treated as soon as possible.

Keywords: *Feed, Laryngitis, Treatment*

Introduction

Necrotic laryngitis is an acute or chronic bacterial infection of the laryngeal mucosa and cartilage of young cattle, characterized by fever, cough, inspiratory dyspnea, and stridor. *Fusobacterium necrophorum*, a gram negative non-spore forming anaerobe, is a normal inhabitant of the alimentary, respiratory, and genital tract of animals and human. It is an opportunistic pathogen that causes several necrotic conditions in animals including necrotic laryngitis. The predisposing factors injuries to tissue from sharp objects or feeds such dry grasses, straw and eruption of teeth in young. Concurrent diseases (persistently viraemic BVDV in calves) and nutritional deficiency may also predispose to such bacterial infection and in adult cattle, the lesions are generally located in the oro-pharynx and are often secondary to trauma from thorny feeds or faulty oral medications (Constable *et al* , 2017). Infected animal become unable to suckle, appetite loss, swelling of cheeks, salivation and open mouth breathing(Wostoupal, 1957).

Fusobacterium necrophorum contain two subtypes, fusobacterium necrophorum subspecies necrophorum and fusobacterium necrophorum subspecies fundiliforme. The bacterium contain different types of toxin which helpful in the pathogenesis; leukotoxin, hemolysin, hemaggultinin, adhesin and endotoxin(Karakurt *et al.*, 2019). This report is about calf diphtheria and treatment outcome of the case.

Case description

A two-year old heifer was presented to AAU-CVMA-VTH on May 21/2021 with history of abnormal breathing and refuses to eat. The Heifer managed semi-intensive, at home fee with dry fodder and drink water. The owner also said the condition was seen two days before visiting VTH. The body temperature, respiratory rate, and heart rate were 40 degrees Celsius, 68 breaths per minute, and 80 beats per minute, respectively. In addition there were

enlarged retropharyngeal and pre-scapular lymph nodes and there was forced breathing (inspiratory stridor, roaring sound, which was heard from far) and rough hair coat. Based on history and clinical sign the case was tentatively diagnosed as calf diphtheria or laryngeal necrobacillosis/laryngitis

Figure 11: A heifer with extended neck breathing and purulent nasal discharge

Case management and treatment outcome

The case was treated with 10% oxytetracycline ((Shanghai Thongren Pharmaceutical Co., Ltd, China) at 1ml/10kg/day for five successive days the first three day were given IV, the other doses are given IM and in addition dexamethasone (Sokar Healthcare Pvt.Ltd. Gujarat India) 0.2mg/kg/day for three days IM. In addition, the owner was recommended to nurse the heifer alone with soft food and provide enough water till it fully recovered. From day two after the start of treatment there were progressive changes on body parameters, feed intake as the owner said and general condition of the heifer. However, till the heifer finished the recommended doses the abnormal respiratory sound was not fully disappeared. Fifteen days later, it was fully recovered and there was also an improvement on body condition of the heifer as shown on figure 12 below.

Figure 12: recovered heifer from laryngitis

Discussion

The current case of calf diphtheria or laryngeal necrobacillosis was diagnosed based on history and clinical signs of the disease. A clinical signs of enlarged retropharyngeal and pre-scapular lymph nodes and forced breathing (inspiratory stridor, roaring sound, which was heard from far), swelling under the jaw and history of appetite loss. Similar clinical presentation were stated by (Wostoupal, 1957). The present case was fully responded for treatment with 10% oxytetracycline for five consecutive days which was injected IV the first three shot followed by IM the left doses and dexamethasone for three days. This treatment regime is similar with the case report of (Feyisa, 2018) done on cow and calf with successful therapy on cow but the calf was not recovered.

Necrobacillosis or laryngitis is a bacterial disease caused by fusobacterium necrophorum, a normal resident of respiratory, gastrointestinal tract and genital system of animal. The bacteria cause a disease when sharp objects or dry feed damage the intact mucus membrane of these organs, the bacterium get access to go deep and cause a disease under anaerobic condition. Early detection and treatment of the case will result in success in treatment of the case, however when diagnosis and treatment of the case may complicated and results in

death of affected animal. Avoiding giving animals dry feed and avoiding sharp material from animals was recommended as prevention measure of the present case.

Limitation

For further confirmation due to the absence of the equipment we did not use diagnostic imaging to clearly locate the affected site and to know the extent of the damage.

3.5. A Case of Listeriosis in Local Breed Goat

Abstract

Listeriosis is a sporadic bacterial disease of animals and humans caused by different species of Listeria, among which *Listeria monocytogenes* is the most pathogenic. On February 8, 2021, a local breed buck with a history of 'circling movement' and decreased feed intake presented to Addis Ababa University's CVMA-VTH. According to the owner, the case was started four days ago and treated with an unknown drug but without relief. The buck was managed intensively and fed frushika and straw. Upon physical examination, the goat was febrile with a rectal body temperature of 40.2^{o}C and frequent heart rate (tachycardia) as well as rapid respiratory rate. In addition, the mucus membrane of the buck was congested. Based on the history, clinical signs, and for laboratory confirmations, the case was diagnosed as listeriosis. Procaine penicillin G at a dose of 22,000IU/kg or 400,000IU/ml, and dexamethasone, IM were planned for therapy. Unfortunately, the buck did not return for the second treatment and dead. The owner has advised visiting the veterinary hospital should be as soon as he noted any strange signs in his animals.

Keyword: *Buck, listeriosis, Treatment*

Introduction

Listeriosis is serious and life threatening bacterial disease affecting animals including human being. Listeriosis is caused by listeria species which are gram positive facultative anaerobe intracellular bacteria ubiquitous and can grow well in too low and high PH (2-9) and temperature (40C-440C).(Dhama *et al.*, 2015), From about seventeen species of listeria

known to be found in the genus only two known to cause clinical illness. These are listeria monocytogenes, which is the most pathogenic species in the genus and listeria ivanovii, it cause listeriosis less commonly. Listeria innocua causes encephalitis in bull and sheep. Listeriosis has zoonotic importance, human acquire infection through contaminated animal product and contact with infected animal placenta, aborted fetus. Listeria monocytogene is the most pathogenic and zoonotic species followed by L.ivanovii, L.seeligerii, L.grayii and L.innocua(Elbar *et al.*, 2020).

Many factors in listeria permit invasion, survival, multiplication and bacterial mobility in intracellular environment. The bacteria enter through oral cavity and migrate to brain where it multiply and cause inflammation. Once phagocytosis is complete, the organism releases its main toxic element, listeriolysin O, and phospholipases. This allows Listeria to escape intracellular death and reach the host cytoplasm, where conditions for replication and growth are maximized(Bayata, 2020).

Listeriosis clinically manifested by two forms. One is by encephalitis form and septicemic form. The encephalitis form is characterized by encephalitis and meningioencephalitis. This form is the most fatal form of listeriosis. Clinically it is manifested by encircling in same direction, reduced appetite, depression, reduced production, neuromuscular incoordination, fascial paralysis, lack jaw, impaired swelling and death. The septicemic form is clinically manifested by diarrhea, abortion and death. The encephalitis form most commonly occurred in ruminant whereas the septicemic form occurs in monogastric animals(Braun, Stehle and Ehrensperger, 2014)

Listeriosis can be diagnosed by detecting the bacteria (listeria) from different body fluid such as blood, cerebrospinal fluid, joint fluid and other sterile sites. However isolation bacteria from the feces cannot help for the diagnosis of the disease, since the bacterium is found in feces of uninfected animals(Elbar *et al.*, 2020). The following case report is about listeriosis in goat (buck) and outcome of the case after handling.

Case description

A local breed buck was presented to Addis Ababa university college veterinary medicine and agriculture, veterinary teaching hospital on Feb, 8/2021 with the history of circling movement and reduced feed intake. The owner also said that the animal is about four day with this condition and even though the buck treated with unknown drug but it doesn't get relief. The buck managed intensively and fed frushika and straw. Upon physical examination the buck was febrile with 40.2^{o}C and frequent heart rate (tachycardiac) as well rapid respiratory rate. In addition the buck was circling on bidirectional sides (as shown in figure (13) below), had congested mucus membrane and restless. Depending on history and clinical finding the case was tentatively diagnosed to be listeriosis.

Figure 13: Buck suffered from listeriosis

Laboratory work and findings

For confirmation of the case, a blood sample was collected from the buck and submitted for bacteriological culture to CVMA microbiology laboratory. First, the sample was directly cultured on listeria enrichment broth, the media changed to turdity, which indicates bacterial growth and then on listeria selective media (Himedia, India) grey small colony was obtained. Then colony was taken from listeria selective media and latex agglutination test was made, here also positive result (aggulitination) was obtained shown of figure 14 below.

Figure 14: listeria growth on different media

Indicate growth listeria on listeria enrichment broth (A), shows listeria colony growing listeria selective media (B), indicates agglutination by listeria colony by agglutination test(C).

Case management and treatment outcome

Procaine penicillin G (North china pharmaceutical, CO, DU) at a dose of 22,000IU/kg or 400,000IU/ml, and dexamethasone, IM (Sokar Healthcare Pvt. Ltd. Gujarat, India) were planned for therapy. Unfortunately, the buck did not return for the second treatment and dead. The owner has advised visiting the veterinary hospital should be as soon as he noted any strange signs in his animals.

Discussion

Listeriosis is an infectious and fatal disease of animals, birds, fish, crustaceans and humans where septicaemia and encephalitis are predominantly observed. The disease is characterized by septicaemia, encephalitis, meningitis, meningoencephalitis, rhombencephalitis, abortion, stillbirth, perinatal infections and gastroenteritis (Dhama *et al.*, 2015). *Listeria monocytogen* is the most pathogenic, zoonotic, frequently occurring and fatal disease of the species of listeria genus. Although on the current case the species of listeria wasnot identified the characteristic clinical sign manifested on the buck was helpful to recognize the species could be *listeria monocytogen*.

Diagnosis is based on history, clinical signs, pathological lesions and detection of the pathogen. Previous exposure of disease, feeding habits, grazing pasture and observation of signs and symptom are helpful for presumptive diagnosis. Definitive diagnosis can be made only after isolation and identification of the bacterium (Fresebehat, 2012). The present case was diagnosed based on history, clinical signs and laboratory finding. On the present case the buck was died after taking the first day of treatment. One of the reasons of deaths of the buck is the damage of trigeminal nerve by the bacterium while moving to central nervous system to cause meningio encephaliti (Dhama et al., 2015) and the other reason could be due to late presentation of the buck.

In conclusion *Listeria monocytogenes*, the most pathogenic species of the genus Listeria, that the cause of serious infections in man and animals. Even though the control of the disease is difficult due to ubiquitous nature of the pathogen, the disease occurrence can be prevented through proper disposal of contaminated material, avoiding feeding silage in disease endemic area and Wear protecting cloth while handling infected animals, aborted material, or removing retained placenta, due the disease has public health importance.

Limitation

During laboratory work of this case there was scarcity reagent for species identification.

Acknowledgement

Am greatful to Dr.Bethel Befekadu and Wubshet for their contribution during laboratory work of the case.

3.6. Escherichia coli caused clinical mastitis in an exotic breed dairy cow

Abstract

Mastitis is the most frequent and costly disease, impacting the dairy industry's production and productivity worldwide. An exotic dairy cow was examined at home in Bishoftu town. The owner complained that his cow's feed intake was reduced and had swollen udder and blood in the milk. The condition began two days before parturition and lasted a week, according to the owner. Despite the fact that it had been treated with an unknown medication before four days, the owner stated that there had been no satisfactory change. The cow was kept with one pregnant heifer and one calf. The management of the animals was poor; with poor drainage system, poor ventilation and no enough space for exercise. Up on physical examination the cow was febrile with rectal body temperature of 40.6^0C and the cow's udder was swollen, hot and painful up on palpation. There was blood containing milk from right hind teat and blood as well as flakes from left hind teat. For etiologic identification a milk sample was taken from the four quarter in sterilized separate bottles and cultured on different selective medium. Therefore, based on history, clinical findings and the laboratory results, the case was confirmed as mastitis caused by *Escherichia coli*. The cow was treated with penstrep for five consecutive days along with dexamethasone for two days. Even though no immediate result was obtained, the cow gradually fully recovered after one month. The owner was advised to appropriately prevent wastes, provide adequate exercise area, and contact a well-trained veterinarian promptly if a problem arose.

Keyword: *Cow, Escherichia coli, mastitis*

Introduction

In Ethiopia mastitis is one of the most common disease hindering the production and productivity of livestock especially in dairy cattle of the country, even though the country is known to have large livestock resource. Poor management condition of livestock management in terms of animal hygiene and its environment, poor provision of feed which the back bone for production and productivity and inappropriate housing of livestock among the major constraints reduced the expected production (Abebe *et al.*, 2016).

Mastitis is a management related disease of dairy cattle, because its occurrence is highly dependent on the management condition of the animal than other factors. In addition, like in other diseases, mastitis occurrence is dependent on the host factors (breed, immune status, age and physiological condition), exposure to microbes and animals environment (Mehmood and Sabir, 2014). Mastitis is caused by major zoonotic pathogens such as *staphylococcus aureus* and *streptococcus agalactiae*. In addition opportunistic pathogens such as *coagulase negative* staphylococci and environmental pathogens such as *Escherichia coli, klabsella, proteusus* (Shaheen, Ha and Su, 2016) and environmental streptococci(Abebe *et al.*, 2016). Other than bacteria there are other less common pathogens causing mastitis which are fungal pathogens *Aspergilus fumigatus* and *Candida albicans* as well as Algal agent like *Prototheca zopfii* (Abera, 2020).

Mastitis can occur either in clinical or subclinical forms. The clinical mastitis is characterized by changes in the udder and milk that are directly observable, whereas the subclinical mastitis is characterized by an increase in somatic cell count in the milk and absence of visible clinical signs. Clinical mastitis is usually accompanied by a mild fever and the animal is depressed(Tadele K and Kebebew T, 2017). The affected quarter is sensitive to touch and painful to the animal. If acute mastitis is not attended and the inflammatory process stay for long, it gets converted into chronic mastitis which may further lead to a progressive fibrosis (hardness) of the gland thereby rendering the milk secreting tissue unable to produce any more milk. These changes are generally incurable and permanent. Often one or more quarters or even the whole udder may become permanently dysfunctional(Tadele Kabeta*, Kebebew Tasow, 2017) .

An important aspect of mastitis therapy is the alleviation of inflammation that can result swelling and subsequent pain associated with clinical mastitis that can cause considerable discomfort to the cow in the udder. Though, the purpose of mastitis therapy is to assist the affected quarter to clear infection as rapidly as possible and to enable a quick return of the cow to normal milk production(Laven, 2021). The conventional antimicrobial agents used in mastitis treatment include penicillin, cloxacillin, erythromycine, cephalosporins, gentamycin, amikacin, trimethoprim-sulfa, ticarcillin, clavulanic acid, polymyxin B, cephalotin, tetracycline, ampicillin, neomycin, kanamycin, nystatin, miconazole and other

drugs with systemic injectable and local intramammary infusion formulation are known to have successful therapeutic effect. However, in some case due resistance development for antibiotics look for using phytotherapy or herbal remedies are recommended(Shaheen, Ha and Su, 2016)

Mastitis can be prevented by maintaining the hygiene and sanitary condition of the animal and its environment. These include good sanitary condition of milking, sanitary herd management procedure (avoiding wet bedding, good housing which means it allow rain and much cold entering and good ventilation) (Shaheen, Ha and Su, 2016) and early and accurate detection and treatment of the disease. While milking the udder and materials used as well the human sanitary condition should be assured properly(Abera, 2020). Therefore this case report going indicate clinical mastitis diagnoses and treatment outcome.

Case description

An exotic breed dairy cow was examined at home in Bishoftu town. The owner complained that his cow's feed intake was reduced and had swollen udder and blood in the milk. The condition began two days before parturition and lasted a week, according to the owner. Despite the fact that it had been treated with an unknown medication before four days, the owner stated that there had been no satisfactory change. Upon physical examination the cow udder was swelled and pus like material comes through left hind teat and blood in the milk from right hind teat. In addition the physical examination reveals that the animal was febrile with a rectal body temperature of 40.6^0 c, tachycardia with 60 beats per minute and 48 respiration rates. The cow was kept with one pregnant heifer and one calf. The management of the animals was poor; with poor drainage system, poor ventilation and no enough space for exercise. Based on history and clinical findings tentative diagnosis was made to be clinical mastitis.

Laboratory finding and report

To identify the causative agent of the disease, laboratory work of culturing milk from each teat was needed. Milk sample was taken from each teats and culture on blood agar (Accumix, India) and MacConkey agar. There was growth of bacteria from sample taken from left and right hind teats; however there was no growth of bacteria from sample taken from the fore teats/quarters. On macConkey agar pink to red, flat colonies surrounded by a pink zone of precipitated bile salts were obtained. For further identification a colony was taken from macConkey agar and sub-cultured on nutrient agar to get pure colony and then from nutrient agar pure colony was taken and cultured on Eosin methylene blue (EMB) media, on which a characteristic green metallic sheen E. coli colony was observed *(Anne).*

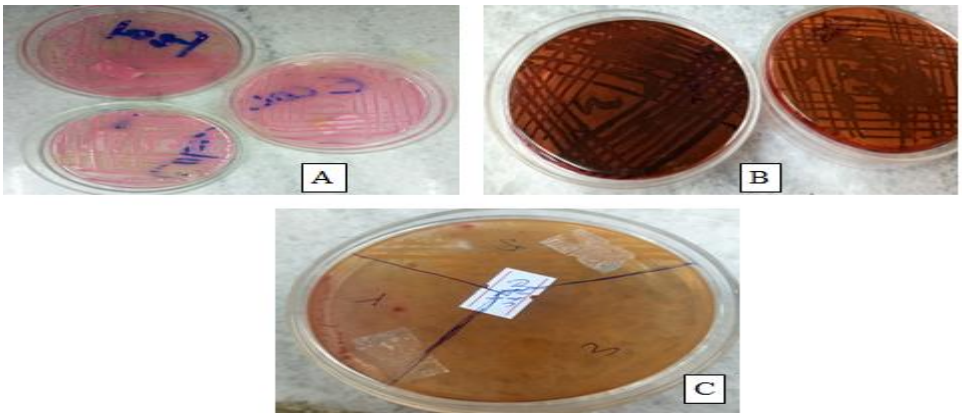


Figure 15: E.coli growth on different media

E.coli colony grown on MacConkey(A) bacterial colony on blood agar from right and left hind teat 1 and 2(C) and characteristic metallic shean colony of E.coli on EMB (B).

Case management and treatment outcome

The cow was treated with penstrep (Interchemie werken 'De Adelaar' B.V., Holland) at a dose of 1ml/20kg for five consecutive days, IM and dexamethasone (Sokar Healthcare Pvt.Ltd. Gujarat India) at a dose of 0.2mg/kg/day for three days, IM. Fever was subsided after treatment and the amount of clot was also reduced but even after finishing the treatment there was clot while seeping the teat and the cow was not comes to its normal production condition for up to a month. Beside these, the owner was advised to clean the cow's environment by properly disposing the feces and as much as possible to call for well-

trained veterinarian immediately when such health problems suspected. A month later, the cow was completely recovered and its udder starts to produce normal milk.

Discussion

Mastitis is the most economical disease of dairy cattle through reduction of production, costs for treatment of diseased animal, discarding of milk to avoid drug resistant associated with drug residue during treatment period and sometimes loss of animal when animals suffered from severe disease condition (Tadele Kabeta, Kebebew Tasow, 2017). The present case of clinical mastitis is caused by Ecoli believed to happen due to bad management condition of cow in which inappropriate waste disposal and unhygienic environment of the animal was found. As (Ndahetuye, 2019) described Ecoli is known to cause environmental mastitis in the cow exposed for pathogen when the teat canal exposed un cleaned bedding, manure and soil.

Most of the time animal infection with Escherichia coli occurs during advanced pregnancy and early lactation period. This is due to animal immunity suppressed on this stage and number of polymorphonuclear leuckocytes decreased. During this stage the cow become energetic and wastes so much energy for achieving a very quick and high peak of milk production, this results in the animal to become metabolically immunosupperesed. However after peak lactation the cow return to its normal defense mechanism in which its susceptibility to opportunistic environmental pathogens decreased(Rangel *et al.*, 2009).

On the present case clinical mastitis caused by ecoli was diagnosed through identification of the causative agent through bacteriological culture on macConkey agar then on eosin methylene blue agar. On macConkey ecoli colony obtained was pink to red, flat colonies surrounded by a pink zone of precipitated bile salts which also indicated by (Ogan and Mith, 2003).

In many condition non antimicrobial treatments such as fluid therapy and administration of steroidal anti-inflammatory drugs along with frequent milking for ecoli mastitis have been recommended unless severe form of mastitis happened because drug resistant problem associated with the pathogen and better when host immune clear (Suojala, Kaartinen and

Authority, 2013), even in severe infection case third generation cephalosporin, cefoxitin and enrofloxacin recommended on this literature, however in present case the cow was treated with penstrep (combination of pencillin and streptomycin) and dexamethasone, the treatment regime was successful.

In conclusion *E, coli* mastitis is a management-related mastitis that occurs when dairy cattle are exposed to an unsanitary environment. As a result, it is strongly advised that the animal's hygienic condition should be maintained through proper waste disposal and the avoidance of carriers who frequently shed the pathogen into the environment.

Limitation

I have not done drug sensitivity tests to choose the right drug that helps to avoid the infection and absence of biochemical test to specifically identify the pathogenic strain. Both these tasks are not done due the scarcity of the resource during the work.

Acknowledgment

Am grateful to Addis Ababa University college of Veterinary medicine, Veterinary Teaching Hospital staff, in particular Mr. Dereje Gudeta for his kind heart to help me while am doing this case.

3.7. Pasteurellosis in a ram

Abstract

Pasteurellosis is a contiguous infectious disease of farm, pet and wild animals and human. A ram with the history reduced feed intake, nasal discharge and coughing presented to VTH of CVMA-AAU. On physical examination, the ram was highly depressed, febrile and has mucoid nasal discharge. A nasal swab sample was taken and bacteriological and biochemical tests were done. From laboratory result, *Mennihemia hemolytica* a cause of pneumonic pasteurellosis *was identified*. The ram was treated with 10% oxytetracycline (10mg/kg) for five consecutive days and fully returned to its normal condition. The owner

recommended managing his flock by avoiding stressful condition such as feed shortage by providing enough feed, overcrowding through giving enough space and ventilation, using prophylactic drug while transporting animals.

Keyword: Disease, Pasteurellosis, Ram

Introduction

Pasteurellosis is a contiguous infectious disease of farm, pet and wild animals, including human being. The diseased is characterized by the signs of septicaemia, croupous inflammation and pulmonary edema, pleurisy, and if chronic – purulent necrotizing pneumonia, arthritis, mastitis, keratoconjunctivitis, endometritis and sometimes enteritis(Laishevtsev, 2020). The disease is caused by pasteurella species, pasteurella/mannheimia heamolytica, pasteurella trehallosi and pasteurella multocida. Of all species pasteurella heamolytica is the major cause of pneumonic pasteurellosis, followed by pasteurella multocida. Pasteurella multocida is also known to zoonotic importance, human get infection through animal bite or exposure of wound to animal saliva(Wilson and Ho, 2013). Pasteurella species are commensal of upper respiratory tract of animals and the occurrence of the disease most frequently associated with the exposure of animal to the predisposing factor such as adverse condition physiological stress, poor nutrition, and other stressful condition such as travel, viral and bacterial infection(Jesse *et al.,* 2020). Generally all factors those suppress the immune system of animals cause multiplication and down ward movement of the bacterium to lower respiratory tract and cause diseases (Hailu *et al.*, 2017).

Pasteurella species are found in the family pasteurellacea , which are gram negative faculatative anaerobe non-spore forming, non-motile grow at a temperature of 370C on blood agar prepared from sheep blood(Jesse *et al.*, 2020). Pasteura multocida comprises five serotypes based on lipopolysaccharide and capsular antigens, which are A, B, D, E and F(Berhe *et al.,* 2017) (Hussain Kalhoro *et al.*, 2015).

Mennihemia hemolytica contains two biotypes (A and T) based on arabinose and trehalosi sugar fermentation. These biotypes in addition divided into 13 serotypes (A1,A2,

A6,A7,A8,A9,A10,A11,A12,A13,A14,A16,A17) which causes shipping fever in cattle, goat and sheep. The principal serotype associated with disease caused by mannheimia hemolytica is serotype A1 in cattle, wheraeas serotype A2 in sheep and goat(Jesse *et al.*, 2019).

Tentative diagnosis is by clinical observation, but this should be confirmed by pathogen isolation. Clinical sampling methods include using nasal swabs (although M. haemolytica can be commensal in the nasal cavity), tracheo-bronchial lavage or broncho-alveolar lavage. There is reasonable agreement regarding isolation of M. haemolytica or other respiratory pathogens between culture results using nasal swabs, transtracheal wash, guarded nasopharyngeal swab, or bronchoalveolar lavage fluid (Capik et al., 2017; Doyle et al., 2017). At necropsy, sampling the pulmonary parenchyma, blood, spleen, liver and bronchial lymph nodes are recommended(Hailu *et al.*, 2017). The bacteriological examination of milk allows differential diagnosis of mastitis due to M. haemolytica from mastitis with another aetiological agent (Mohamed and Abdelsalam, 2008).

Antimicrobial drugs such as enrofloxacin, oxytetracycline chloramphenicol and ampicilli are useful for control and prevention of the disease. However, this measure cannot be consistent solution because of antimicrobial resistance developed by etiologic agent. The best option is vaccination to decrease the disease incidence and minimize antimicrobial use (Berhe *et al.*, 2017).

Case description

On April 12/2021 a ram was presented to AAU-CVMA VTH with a history of coughing, reduced feed intake, depression and nasal discharge. The owner also said that the sheep was bought one day before the start of this progressive signs and the sign lasted three days. The ram was managed intensively, feed frushika and home left out food. Upon physical examination the sheep was febrile with a rectal body temperature of 40.3^0c, tachypnea with 40 breath perminute, 48 beats per-minute and harsh crackles of lung upon auscultation. In addition the sheep was highly depressed, has rough hair coat, enlarged pre-scapular, parotid and retropharyngeal lymph node and congested mucus membrane. Based on history, clinical finding and the case was tentatively diagnosed as pneumonic pasteurellosis.

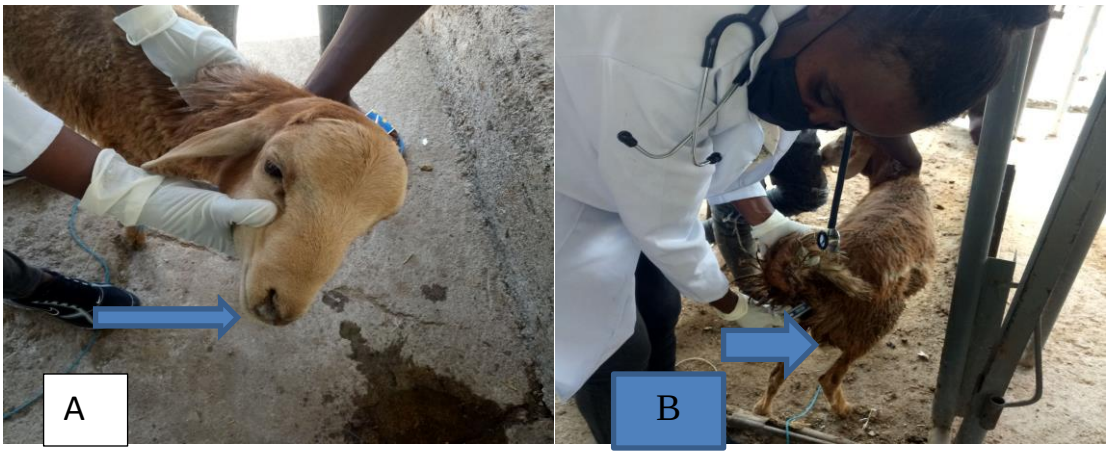


Figure 16: Indicate depressed ram with serous to mucoid nasal discharge (A), Indicates Measuring the body temperature with increased parameter (B)

Laboratory work and result

For further confirmation a laboratory work was performed on the nasal swab sample collected from the ram. The nasal swab was taken from the ram after cleaning the tip and external part of the nose with gauze using savlon and the swab was inserted into the nose and rotated against nasal wall. The swab was then put into 10ml tryptose soy broth media (Himedia laboratory pvt.Ltd, Dindhori, Nashik, India) and transported to veterinary microbiology laboratory of AAU-CVMA and incubated at 37^0C for 24 hours, and then the enriched sample was cultured on macConkey agar (Himedia laboratory pvt.Ltd, Dindhori, Nashik, India) and blood agar incubated at 37^OC for 24 hours. Pinkish colony was recovered on macConkey agar and smooth and greyish on blood agar with extensive degree of hemolysis were obtained. The obtained colony was then transferred to nutrient agar and different biochemical tests were performed. Such as Indole test and latex agglutination test. Based on the bacteriological result and biochemical results the species pasteurella that cause pneumonic pasteurellosis for present case is mannihemia hemolytica indicated on figure below.

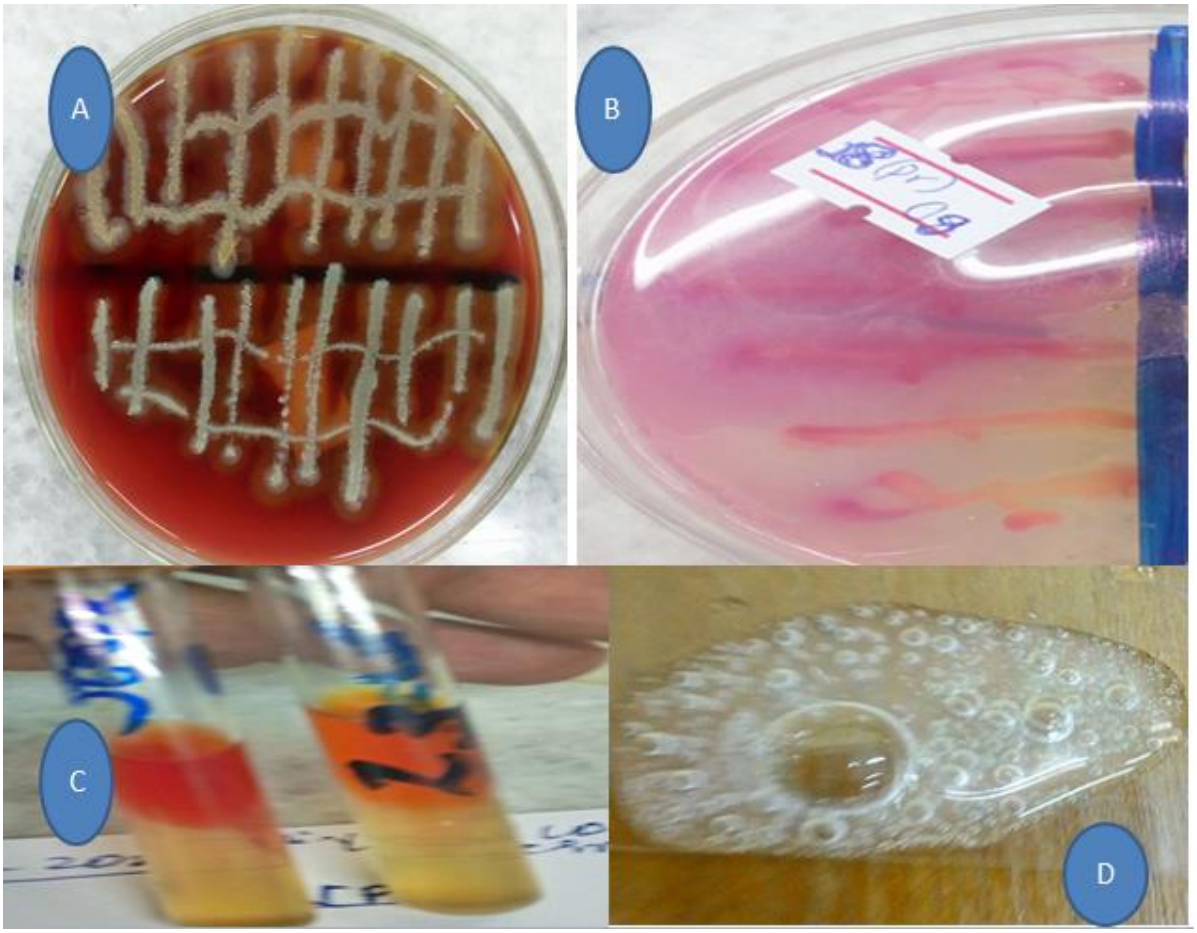


Figure 17: Pasteurella growth on different media and biochemical test result

Greyish colony on blood agar (A) pinkish colony on macConkey agar (B) indole positive result(C) latex agglutination test positive (D).

Case management and outcome

The ram was treated with broad spectrum antibiotics, (10%) oxytetracycline (Shanghai Thongren Pharmaceutical Co., Ltd, China) 10mg/kg for five consecutive days. After the start of the treatment the ram was gradually recovered and after completing the treatment it was completely recovered. The body parameters return to normal.

Figure 18: Recovered sheep from pneumonic pasteurellosis

Discussion

The present case of pneumonic pasteurellosis based on clinical findings of pyrexia, tachypnea, serous to mucoid nasal discharge, harsh crackles of lung sound upon auscultation and history obtained from the is in line with (Abdullah and Chung, 2014) done at Malaysia. As indicated on the history the ram has travel/transport history that can pose the animal for stressful condition. Many authors agreed that travel is one of the risk factor that pose the animals for stressful and immune suppressive condition(Brogden, Lehmkuhl and Cutlip, 1998).

The first and utmost purpose of treating an animal suffer from pneumonic pasteurellosis is to save the animals live and these will achieved through early detection of the pathogen and administration of the proper drug for which the pathogen is susceptible. Many authors recommended using these drugs Oxytetracycline, trimethoprim, sulfonamides, penicillin, timilcosin, streptomycin and florfenicol to treat ovine pasteurellosis(Amnesty International, 2007). On the present case also the ram was treated with oxytetracycline (10%) for consecutive five days. It was recovered.

Limitation

Drug sensitivity test was not performed due to lack drugs disks.

Acknowledgement

I am gratefully acknowledging Dr.Tesfaye Bekele for his contribution through provision materials and media needed for bacteriological culture of the sample and biochemical tests.

3.8. Peste Des Petits Ruminants (PPR) in Goat

Abstract

A Peste des petits ruminant (PPR) is highly contagious viral disease of small ruminants. A local breed goat with the history of coughing and diarrhea was presented to AAU-CVMA-VTH on April 14/2021. The buck was febrile, with a rectal body temperature of 40.5 degrees Celsius, nasal and ocular discharge, and an ulcerated oral cavity lesion. The case was confirmed as pest des petits ruminants (PPR) based on the history, clinical findings, and cELISA result. The treatment of the buck was commenced with 10% oxytetracycline and vitamin B-complex; however the buck died after the second day of therapy. The owner recommended bringing all the rest of his stock of goats to take prophylactics antibiotics. In conclusion PPR is highly contagious viral disease with high mortality and morbidity of diseased animal. Therefore proper control of PPR, there is need of strong support of diagnostic methods and proper, timely vaccinations of the susceptible population upon understanding the epidemiology of the disease are imperative.

Keyword: *Buck, Pestedes petitis ruminat, Vaccination*

Introduction

Peste des petits ruminant is an acute, highly contagious and economically important transboundary viral disease of sheep and goats associated with high morbidity and mortality up to 100 percent (Munir, 2013). PPR is clinically manifested by pyrexia, oculonasal discharge, gastroenteritis, necrotizing and erosive stomtatitis, diarrhea and bronchopneumonia. The causative agent, PPR virus (PPRV) is an enveloped sinlge stranded RNA virus belongs to the genus Morbillivirus of the family Paramyxoviridae (sub family Paramyxovirinae) under the order Mononegavirales with other members of the genus, which include rinderpest virus (RPV), measles virus (MV), canine distemper virus (CDV), phocine

distemper virus (PDV) and dolphin and porpoise morbillivirus (DMV)(PReP, 2013). PPR contain only one serotypes depending on specific region of nucleocapsid and fusion gene, but it divided into four lineages, lineage I and II found only in west Africa, whereas lineage III found in the east Africa including Ethiopia and lineage IV found in middle east (Munir *et al.*, 2011).

Animals of all ages are susceptible to the disease. However, the disease is more fatal in kids and lambs. The virus spread through close contact between infected and healthy animals. Primarily it is transmitted through respiratory route. PPR disease was first recorded in West Africa in 1940s by Prevalence was also found in other parts of Africa and Middle East(PReP, 2013).

PPR is diagnosed by clinical signs observed on diseased animal, pathological changes observed in different organs and through detection of specific antigen or antibodies in clinical samples (such as serum, formalin fixed tissue, nasal and ocular discharge) molecular and serological tests(Sharawi and Yousef, 2010). cDNA, neutralization test, MAb-based ELISA and real time reverse transcriptase PCR are best for serological and molecular detection of antibodies and antigen. Real time RT-PCR and loop mediated isothermal amplification are the most sensitive and fastest methods for detection of PPRV RNA in clinical samples.

PPR can be controlled through isolating infected animal till it fully recovered and proper disinfection of contaminated equipment. Restriction of animal movement between disease endemic and disease free area is also another measure. The other most important approach for prevention and control of the disease using vaccine before disease occurrence(Vinayagamurthy *et al.*, 2014).

Case description

A flock holding five goat was brought on April 14/2021 to Addis Ababa University College Veterinary Medicine and Agriculture, Veterinary Teaching Hospital with history of coughing, diarrhea, nasal discharge and lacrimation. The owner also said that the goats are feeding outside in market left out of vegetables, fruits and grains and the flock did not take

any vaccine or treatment before. In addition the owner also said from the flock two were died with similar symptoms. Upon physical examination the goat the goats were febrile with 40.5^0C, respiratory rate of 44 breaths/minute and 60 beats/minute. There was also mucoid nasal discharge and mucoid lacrimation, congested mucus membrane and slight crackling sound through the lung and the rear part was soiled.

Figure 19: Muciod nasal discharge and lacrimation (A), ulcerative lesion in the oral cavity (B)

Laboratory finding and result obtained

For laboratory confirmation a serum sample was collected using vacationer tube. Serum was separated after centrifugation and the serum was then transferred cryovial tube put in minus twenty refrigeration till it processed. The sample was then taken and transferred to national veterinary institute (NVI) for cELISA. The NVI confirmed that the presence of antibody against PPRV indicated on Annexe 3.

Ultrasound imaging of the lung was taken after the thoracic area of the goat shaved and the imaging gel has applied over the area. Pneumonic area was obtained on dorsal left lung as indicated on figure 18 below.

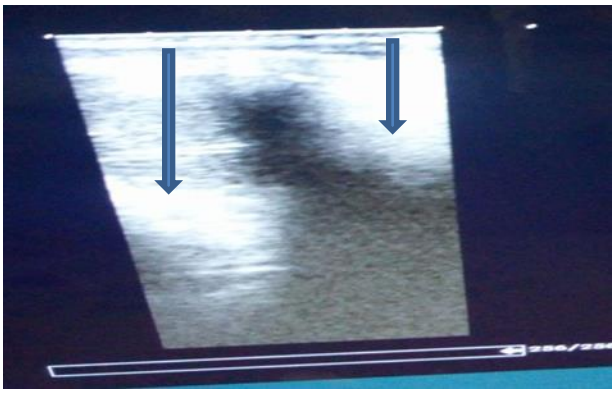


Figure 20: Ultrasound image indicating pneumonic lung (arrow hyperechoic image)

Case management and treatment outcome

The buck was treated with 10% oxytetracycline ((Shanghai Thongren Pharmaceutical Co., Ltd, China) at dose of 10mg/kg and vitamin B-complex (Reyoung Pharmaceutical Co.,Ltd, China) for two consecutive days, however on the third day the buck was died before finishing the recommended duration of treatments.

Discussion

Three methods can applied for diagnosis of PPR outbreak on the specified area. These methods are molecular method for detection of antigen or its nucleic acid (RNA), serological methods of detecting the antibody produced against the antigen and clinical sign based case recording(Sharawi and Yousef, 2010). The tentative diagnosis of PPR based on clinical finding of nasal discharge, lacrimation, diarrhea, coughing and petechial hemorrhage in the oral cavity is similar with the report of (Kinimi *et al.*, 2020). On the present case the buck was died due to acute lung congestion and edema occur following exposure of the animal to the PPRV (Zakian, 2016).

There is no specific treatment against PPRV for diseased animal, however supportive therapy with antibiotics is recommended to avoid secondary bacterial complication and other supportive therapies(B-complex, dextrose) to help the host immunity to clear out the viral infection(Zakian, 2016). Eventhough, the buck was died after second day administration of the treatment, it recommended to be treated for five consecutive days with 10% oxtetracyline and vitamin B-complex.

On the present case of PPR it is confirmed with cELISA through detection of antibody in serum and ultrasound result. (Sharawi and Yousef, 2010) also used cELISA for diagnosis of PPR in there study of isolation, serological and real time RT-PCR in naturally exposed Arabian Gazelle, however on serological diagnosis they did not detect the an antibody, they put a justification of it is due to early detection before the animal produces an antibody, but they assure that serological method is useful for diagnosis of PPR in absence of vaccination history. Similarily the present case has no vaccination history as well as the hyperechoic condition of the lung indicates the goat is suffered from the given disease.

3.9. Malignant Catarrhal Fever in Local Breed Bull

Abstract

Malignant catarrhal fever (MCF) is a fatal lymphoproliferative disease of cattle and other ungulates caused by the ruminant gamma-herpesviruses alcelaphine herpesvirus 1 (AlHV-1) and ovine herpesvirus 2 (OvHV-2). A two year old bull was presented to AAU-CVMA-VTH on May 24/2021 with the history of reduced feed intake, shivering, nasal discharge and lacrimation. The bull was managed semi-intensively and housed and feed on together with sheep (cohoused), horse and donkey. Up on physical examination bull was highly emaciated, bilateral yellowish mucopurulent nasal discharge, lacrimation frequent blinking of eye, bilateral corneal opacity, salivation and foamy mouth and prescapular and prefemoral lymph node enlargement. Body vital parameters revealed that the bull was febrile with 41.4 ^{o}C, 40 breath/minute and 48beats/minute of temperature, respiratory and heart rate respectively. Based on history and clinical sign manifested on the bull the case was tentatively diagnosed to be malignant catarrhal fever. In addition also post mortem lesion and PCR confirmed the case is malignant catarrhal fever. Even though the bull was started treatment with fluid therapy on first day, 10% oxytetracycline and diclofenac, the bull was died. In conclusion malignant catarrhal fever is viral disease of cattle and other angulate. Sheep and wildebeest are the asymptomatic carrier of the disease, separating the susceptible and carrier animals are highly recommended to control and prevent the disease occurrence till vaccine is produced against the disease.

Keyword: *Cattle, Sheep, Malignant catarrhal fever*

Introduction

Malignant catarrhal fever (MCF) is a fatal lymphoproliferative disease of cattle and other ungulates caused by the ruminant gamma-herpesviruses alcelaphine herpesvirus 1 (AlHV-1) and ovine herpesvirus 2 (OvHV-2). The other recently identified viruses known to cause MCF include caprine herpesvirus-2 (CpHV-2), which is enzootic in domestic goats. These viruses infect their reservoir hosts efficiently and without apparent-disease (Dettwiler *et al.*, 2011).

Alcelaphine herpesvirus 1 (AlHV-1) and ovine herpesvirus 2 (OvHV-2) are the major causative agents responsible for wildebeest-associated MCF (WAMCF) and sheep-associated MCF (SA-MCF) respectively in cattle and other ruminant species. WA-MCF is an economically important disease of cattle in Africa, where wildebeest are present and SA-MCF is prevalent worldwide where sheep husbandry is practiced(Gelaye *et al.*, 2013).

It is fatal lymphoproliferative disease when they infect MCF-susceptible hosts, including cattle, deer, bison, water buffalo and pigs. MCF is typically fatal; however, there are outbreaks in which several animals are affected, with evidence of recovery and mild or inapparent infections in some cases. MCF is found worldwide wherever susceptible hosts mix with reservoir species. The disease transmitted in reservior host both vertically in utero (wild beest associated) and by close contact. MCF is transmitted from resevior to susceptible host such as cattle by close contact through aerosols and contamination of pasture by the discharge of reservior animal. However cattle's are a dead end host for malignant catarrhal fever because once they are infected they did not transmit the disease to other animals(Horner, 2003).

In diseased animals the clinical signs of MCF are highly variable and many overlapping but distinct clinical patterns are recognized peracute, head and eye, alimentary, neurological and cutaneous have been described. In peracute case there may or may not be clinical signs or depression followed by diarrhea and dysentery may develop 12-24 prior to death. In general the disease is characterized by high fever, in appetence, ocular and nasal discharge, kerato-

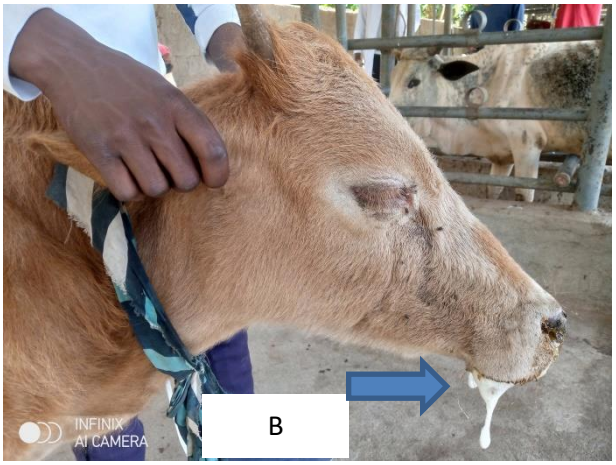
conjunctivitis with bilateral corneal opacity starting at periphery and decrease in milk yield(Li, Cunha and Taus, 2011).

Diagnosis of malignant catarrhal fever has multiple challenges which include clinical resemblance to many of the viral diseases and highly complex pathogenesis and epidemiology. The diagnostic method is different in different clinically affected animals and reservoir hosts due to biology of the MCF viruses and host responses to the viruses. Clinical signs and different assays such as serological tests, PCR, histopathology, isolation and identification of virus are used for detection of MCFVs or diagnosis of the disease caused by the viruses(Wallman and Thompson, 1982). Gross pathological changes are generally widespread and may involve most organ systems. Salivation and oral hyperaemia may be an early sign and may progress to erosions of the tongue, hard palate, gums and characteristically the tips of the buccal papillae. Sometimes skin ulceration and necrosis may develop, which may be extensive or restricted to the udder and teats. Erosions and haemorrhages in the gastrointestinal tract may be evident(Moore *et al.*, 2010).

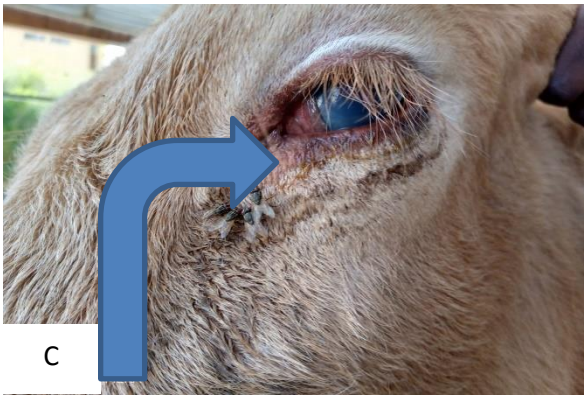
On necropsy finding urinary bladder often has characteristic ecchymotic haemorrhages of the epithelial lining, especially in bison. In kidney, extensive multiple raised white foci; each 1–5 mm in diameter may appear. The brain may also show signs characteristics of non-suppurative meningoencephalitis. The serological tests have been developed for detection of MCFV(Zamila *et al.*, 2011). These tests are useful only for WA-ALHV-1 detection because this virus can propagated invitro. These assays include virus neutralization (VN), enzyme-linked immunosorbent assay (ELISA)/competitive-inhibition ELISA (CI-ELISA). The use of PCR allows sensitive confirmation of the presence of MCF viruses in infected animals and also useful for phylogenetic and epidemiological studies in both natural and MCF-susceptible hosts. Both conventional and quantitative real-time PCR assays have been developed for the detection of OvHV-2 and AlHV-1 viral DNA(Toole, Li and Crawford, 2000). The OIE approved nested-PCR was found to be 10-fold more sensitive than quantitative PCR. However, real-time PCR assays have the potential to define viral loads in a range of tissues from both natural and MCF-susceptible hosts(Swai *et al.*, 2013).

Case description

A two year old bull was presented to AAU-CVMA-VTH on May 24/2021 with the history of reduced feed intake, shivering, nasal discharge and lacrimation. The bull was managed semi-intensively and housed and feed on together with sheep(cohoused), horse donkey. Up physical examination bull was highly emaciated, bilateral yellowish mucopurulent nasal discharge, lacrimation frequent blinking of eye, bilateral corneal opacity, salivation and foamy mouth and prescapular and prefemoral lymph node enlargement. Body vital parameters revealed that the bull was febrile with 41.4 ^{o}C, 40 breath/minute and 48beats/minute of temperature, respiratory and heart rate respectively. Based on history and clinical sign manifested on the bull the case was tentatively diagnosed to be malignant catarrhal fever.



A= yellowish muciod nasal discharge, B= foamy salivation



C= corneal opacity D= emaciation with prominent ribs and pelvic bone

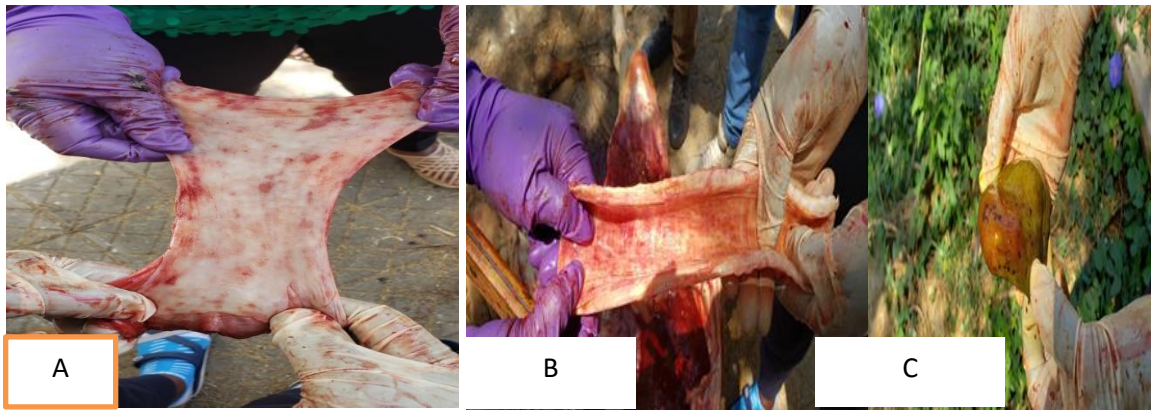
Figure 21: Different clinical findings observed on MCF affected bull

Case management and supportive therapy outcome

The treatment of the bull was aimed at avoiding secondary bacterial complication and reducing pain. 10% oxytetracycline (Shanghai Thongren Pharmaceutical Co., Ltd, China) at dose 10mg/kg IM was order for five consecutive days. In addition diclofenac sodium was administered IM for consecutive two days. However, the bull was on good condition on the first and second, it become weak and unable to move, for this reason the owner call us to go his home and give treatment. On the time we reach home the bull was lethargic and unable to move long. We administered the treatment and on the following day morning the bull was died.

Post mortem investigation and laboratory finding

Immediately after the bull was died the carcass was opened for post mortem diagnosis of organs. For post mortem finding some organs were properly examined. The trachea, esophagus, Lymph nodes, lung, liver, kidneys, gall bladder, gastrointestinal tract were examined. On post mortem investigation we petechial and echymomic hemorrhages on different organs such esophagus, trachea and on small and large intestine. White foci on kindney, ulcerated lesion on abomasum, in addition enlarged kidney and up on incision fatty degeneration and the gall bladder enlarged and vascularized, indicated on the figure below.



A= hyperemic esophagus, eroded lesion on gall bladder©, hemorrhage on trachea and dipethratic mucus membrane(b)

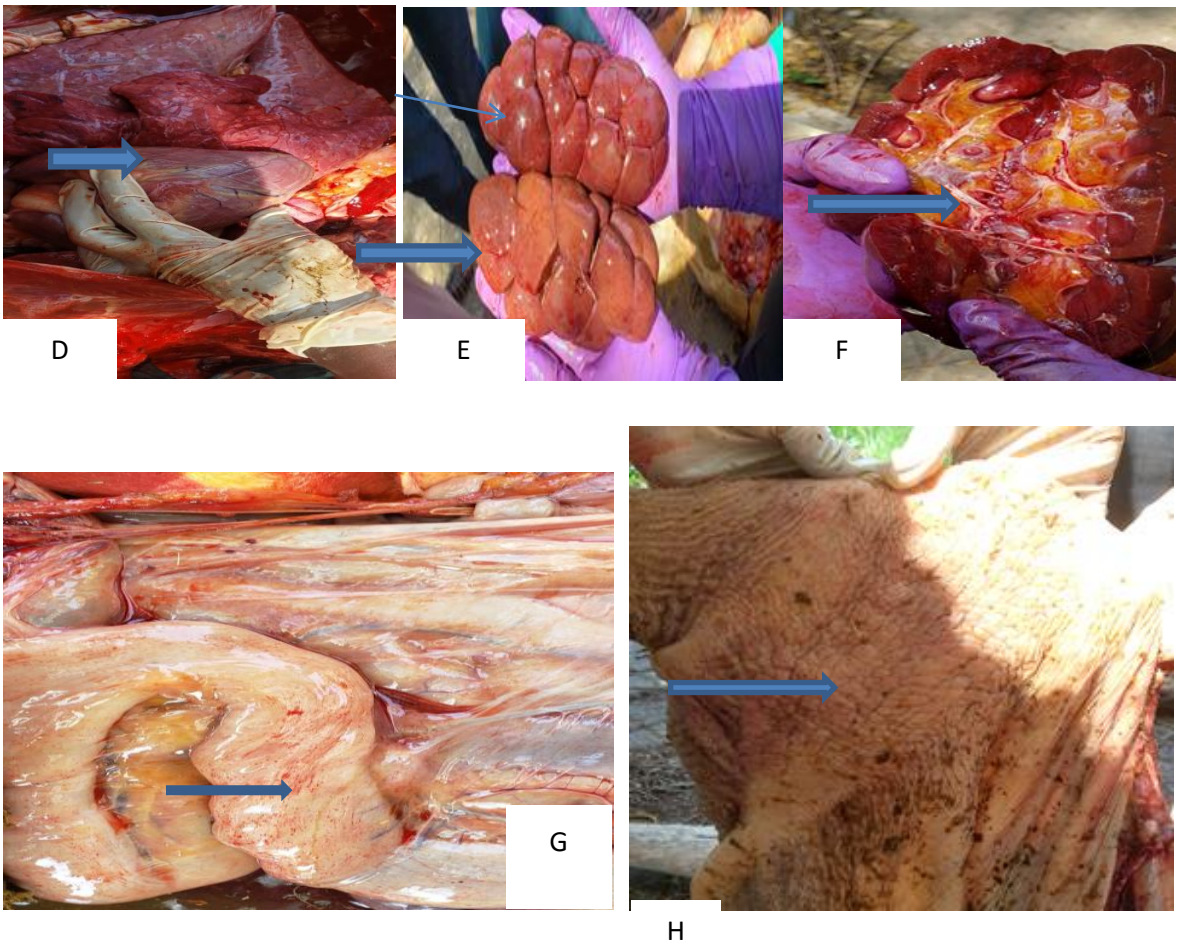


Figure 22: post mortem findings of MCF affected bull

D= engorged heart E= infarct and white foci on kindney F= fatty degeneration G= hemorrhage on intestine H= lesion on abomasum

Polymerase chain reaction

For molecular diagnosis DNA extraction was made from pathological tissue samples (kidney, liver and lymph node) and then OHV-2 detected in sample using conventional PCR diagnostic method. Ovine herpesvirus type two DNA was detected in the sample. The laboratory result indicates the bull was suffered from malignant catarrhal fever caused by ovine herpes virus type two. Figure below indicated;

M S1 D2 D3 D4 EC Pc Pc Nc Pc M

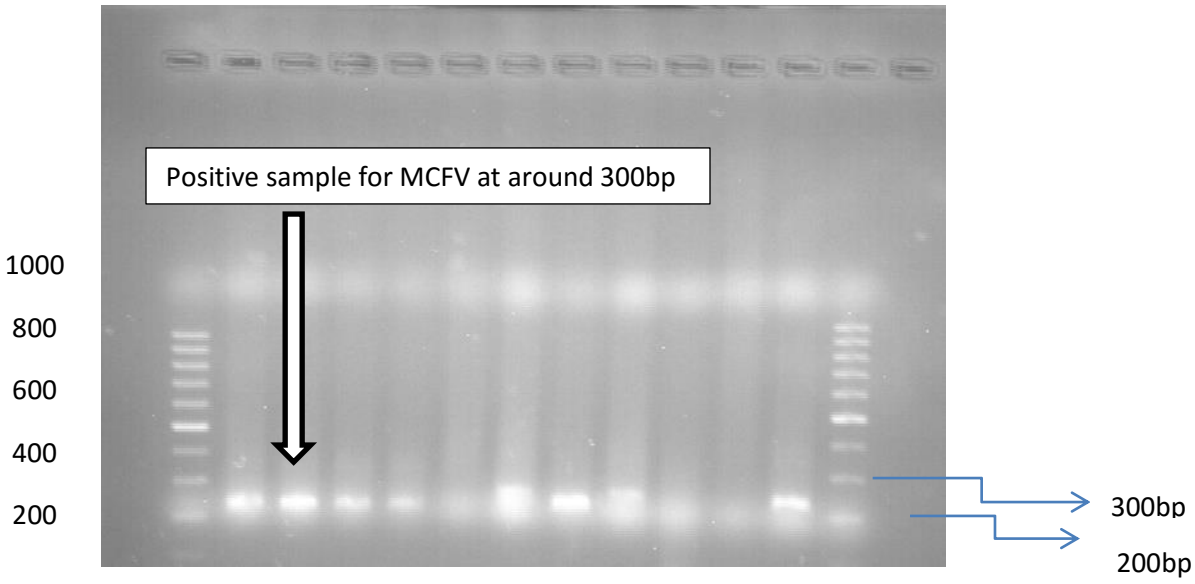


Figure 23: PCR postive MCF

KEYS: M, molecular ladder, S1 Sample one D2-D4 doubilacated samples of sample 1,200-1000, base pair, NC negative control, PC, positive control

Discussion

Malignant catarrhal fever is highly fatal viral disease of cattle, buffaloes, deer and other large ruminants. Malignant catarrhal fever is caused by virus belongs gamma herpes virus alcephine herpes virus 1 acquired from wildebeest and ovine herpes virus 2 carried by sheep. The disease is characterized by clinical sign of appetite loss, self-isolation from the stock, lethargy, emaciation, fever, lymph node enlargement, bilateral corneal opacity, nasal and ocular discharge and hyperstasia (Zamila *et al.*, 2011),(OIE, 2020). The On the present case all this clinical signs are manifested in the diseased bull.

On necropsy finding of malignant catarrhal fever affected cattle may reveal erotic lesion in mouth and nasal cavities, dipethratic mucus membrane, hemorrhage on serosal surface infarct and white foci in on the renal cortex and enlarged superficial lymph nodes. For laboratory diagnosis appropriate samples are formalin fixed lymph nodes, brain, pharynx, esophagus, rumen, small intestine, liver, kidney, urinary bladder, salivary gland, cooled spleen are helpful for viral DNA detection using polymerase chain reaction (PCR). The

gross pathological finding obtained on the present cases are similar to previous reports of (Horner, 2003), (Pesca *et al.*, 2019).

Diagnosis of MCF needs manifestation of clinical picture of the disease by the infected animal, presence histologic lesion on histopathological findings and polymerase chain reaction assay result(Horner, 2003). The present case was diagnosed based clinical findings, post mortem lesion and PCR result.

Prevention and control of transmission of sheep associated malignant catarrhal fever (OvHV-2) can be obtained through separating the carrier (sheep) and susceptible animals. Cattle acquire the disease and develop clinical signs through close contact with infected sheep (cohousing). Once an outbreak of MCF in cattle is identified, control efforts will typically not be possible because of the long incubation period in cattle. There is currently no vaccine available to prevent the development of disease in susceptible species. MCF is known by high mortality rate due to severe and diffuse interstitial pneumonia characterized by thickening of alveolar wall and interstitial accumulation of macrophage and proliferation of type two pneumocytes and accumulation of cell debris in aveolar lumen. In addition also there is severe, fibrinoid, necrotizing arteriolitis.

In conclusion MCF is a viral disease of cattle and other wild ruminants. Cattle acquire the disease from sheep and wildebeest, in which sheep associated malignant catarrhal fever caused by ovine herpes two and wildebeest associated malignant catarrhal fever virus (alcephine herpes virus one) transmitted through close contact by aerosol. The possible control measure of the disease is separation of reservoir and susceptible hosts.

Acknowledgement

I am grateful to Dr. habele worku for her collaborative work while performing post mortem finding, national veterinary institute of Ethiopia for their willingness to do PCR and animal owner for his consent for post mortem examination.

3.10. Case report on sheep and goat pox

Abstract

Goat pox is a contagious viral disease, which is common in small ruminants. It causes economic losses resulting from decreased milk production, damage to the quality of hides and wool, and other production. A lamb and buck were presented to AAU-CVMA-VTH on April 12 and 19 respectively, from same flock with history of the lamb and the buck suffer from local name “fentata” and loss of appetite. There were generalized nodular lesion, lymph node enlargement, depression and rise in body temperature. Based on history, clinical finding and laboratory finding the case was diagnosed as goat pox. The animals were treated with 10% oxytetracline for consecutive three days and dexamethasone for consecutive two days. However as the owner reported the lamb was found dead on second day after the start of treatment. The buck was shown progressive change in feed intake, body condition and body temperature was also returns to normal, fifteen days later the buck was fully recovered. Sheep pox and goat pox are contagious viral diseases of animals which affects the economy of small ruminant’s producer through damaging skin and wool as well death of diseased and production loss. Vaccination is used to control sheep pox and goat pox in endemic areas. Outbreaks in non-endemic areas can be controlled with movement controls and depopulation of infected and exposed animals, followed by gently cleaning and disinfection of farms and equipment. Proper disposal of infected carcasses is important used and the owner was advised to vaccinate their small ruminants.

Keywords: *Buck, Economy, Sheep and Goat pox*

Introduction

Sheep (ovia aries) and goat (capra hircus) pox highly contagious viral disease of sheep and goat characterized by generalized nodule subcutaneously, especially on hairless area like under tail, internal organs on the lung, fever, enlarged of lymph nodes and sometimes death. Sheep and goat virus belongs to genus capripox togother with lumpy skin disease virus,

family poxviridea, subfamily chorodopaxvirinea(Yune and Abdela, 2017). The viruses are single stranded protein enveloped DNA virus. The viruses are susceptible to various disinfectant, lipid solvent and acids. In addition the viruses are highly susceptible to sunlight, very high PH as well very low PH, however they may survive dark and cool environment as well as PH 6.6 and 8.6. The disease affects the economy through reduction of production, limit trade export, damaging skin quality and death of diseased animal(Cg *et al.*, 2017).

Once infect the susceptible host the virus is excreted through varies secretion and excretion. The virus is excreted through milk, urine, feces, skin lesion and secreted into nasal, conjunctiva and lacrimal secretion(Wol *et al.*, 2020). Healthy susceptible host get infection through contact with these secretions and excretion as well as through introduction of these secretion into respiratory tract. In addition the disease is transmitted through transovarial transmission from infected ewe or doe to its lamb or kids. The other important transmission way of the disease is through contaminated material and mechanical transmission by insects(Mirzaie and Bokaie, 2015) .

Sheep and goat pox can be diagnosed through characteristic clinical signs which generalized nodular lesion, lymph node enlargement and fever. The most effective way of diagnosing the disease is detection the virus in pox lesion by electron microscope and virus isolation and identification. In addition the disease can be diagnosed through histopathologic lesion, polymerase chain reaction (PCR), serum neutralization test, fluorescent antibody test and indirect fluorescent test, real time PCR and isothermal genome amplification. From all listed diagnostic methods real time PCR and isothermal genome amplification is the most effective diagnostic measure, because these methods are useful in detecting specific species of sheep and goat pox virus(OIE, 2017).

Even though the disease has no specific treatment, diseased animals need to get good care that is helpful to boost the immunity of the animal and avoid secondary bacterial complication. To get this the diseased animal should put in clean, well ventilated condition and feed balanced food. Prevention and control of the disease rely on using attenuated vaccine (Rao and Pharma, 2014).

Case description I

A three month lamb was presented to AAU-CVM-VTH on Aprill 13/2021with the history of coughing and lesion on the body. The owner also said that the lamb is reduced in feed intake and depressed with this condition about three days. Up on physical examination the lamb was febrile with 40.5^0C, 44 and 78 respiratory and heart respectively. In addition the mucous membrane was congested, serous to mucopurulent nasal discharge, prescapular lymph node was enlarged and depressed. Based on history and clinical finding the case was tentatively diagnosed as sheep pox.

Figure 24: Nodule on nose and nasal discharge (A) nodule on the ventral side of the tail (B)

Case description II

An adult male goat was presented to AAU-CVMA-VTH on April 19/2021 with history of the goat suffer from “fentata”, refuse to feed and depressed. Upon physical examination generalized nodular lesion throughout the body, enlarged lymph node and the goat was febrile with 41.3^0C body temperature. Congested mucus membrane and rough hair coat as shown on the figure below

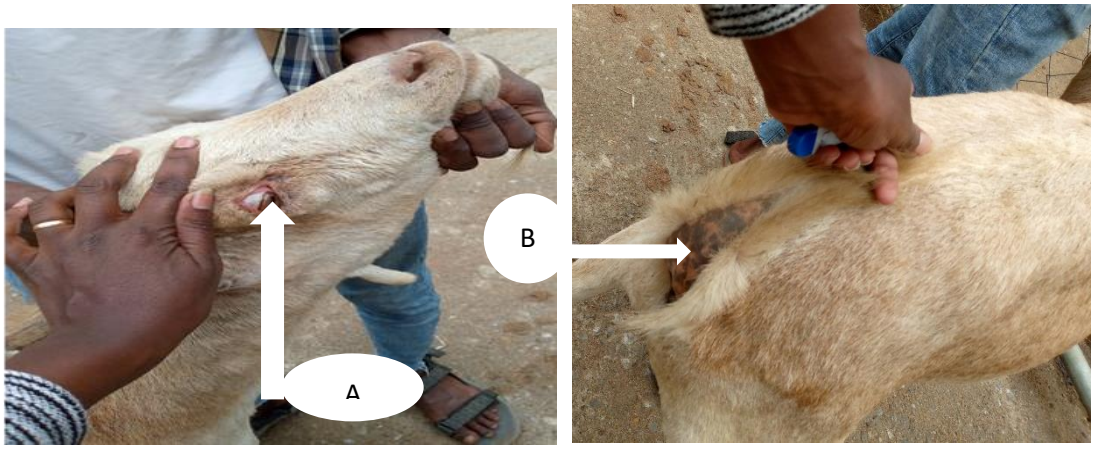
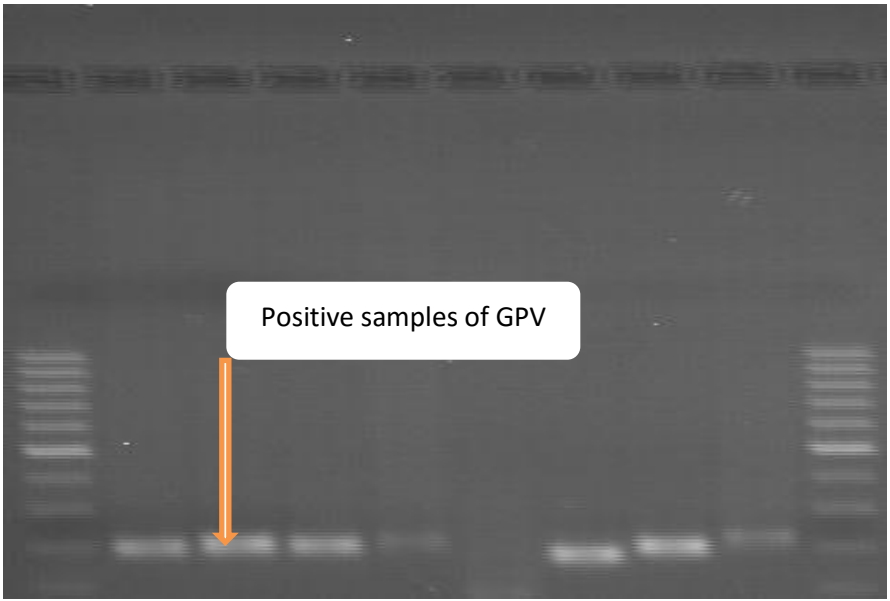


Figure 25: Clinical manifestation of goat pox

A= congested mucus membrane and nodule on face B= nodule on ventral side of the tail

Laboratory investigation and results obtained

For laboratory confirmation of the case nodular lesion was taken after 2% lidocaine was infiltrated around the selected lesion. The sample was taken from the right fore limb on the ventral sides of both animals. Scalpel blade and surgical forceps are used to take the lesion. The sample were then put in VTM and put in minus 20^0C till it taken to national veterinary institute (NVI). After taking the sample the site were cleaned with 2% iodine and warped for three days. Few days later after finishing the process need to done for laboratory analysis at NVI, the samples were taken to NVI for viral DNA detection using polymerase chain reaction (PCR). Conventional PCR result indicates both samples are positive for goat pox virus. Finally based on history, clinical finding and laboratory result the cases were diagnosed as goat pox in both lamb and buck.



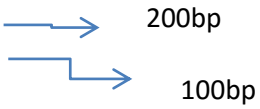


Figure 26: PCR result pox in sheep and goat

Where M= molecular ladder, S1-S4= samples, EC= extraction control, SPPC= sheep pox positive control, GPPC= goat pox positive control LSD= lumpy skin disease positive control

Case treatment and management outcome

Both the lamb and the buck were treated with supportive therapy of antibiotic and ant inflammatory drugs. 10% oxytetracline (Shanghai Thongren Pharmaceutical Co., Ltd, China) at a dose of 10mg/kg for consecutive five days and Dexamethasone (Sokar Healthcare Pvt.Ltd. Gujarat India) 0.2mg/kg/day for three consecutive days were administered I.M. The owner also recommended separating diseased and nursing at home. The owner reported the lamb was died on next day after first day treatment but the buck shows progressive change from day to day and on the fifth day it completely cured even though few nodules were left. The nodules were completely disappeared two weeks later.

Figure 27: Recovered buck from pox

Discussion

Goat pox is a contagious viral disease of small ruminant. The disease causes economic loss through reduction of milk production, treatment and control cost and reduction of skin and wool quality. The current case was diagnosed as goat pox in lamb and buck based on severity of the disease in the lamb, clinical findings, history and laboratory result. In addition also the reason for the death of the lamb could be severity of the disease in young animal and the strain of pox, which goat pox severely affects sheep than that of sheep pox. Clinical finding of generalized nodule, fever, congestion of mucus membrane, anorexia, roughness of hair coat and enlargement of lymph node similar with the finding of (Barua *et al.*, 2017; Cg *et al.*, 2017).

Serological test cannot differentiate between sheep and goat pox viruses, both viruses are strain of single virus and there is possibility cross protection. However the two viruses are genetically distinct and the viruses are nearly related to lumpy skin disease virus affecting cattle. Even though the three species of viruses are belongs to same genus of Capri pox virus all the three species are host specific except some strains of goat pox virus which infect also sheep and cause severe disease in sheep (Barua *et al.*, 2017). On the present case also goat pox virus was detected in sheep with severe clinical sign manifestation and PCR based diagnosis of the viral genome.

Management of the case should directed towards controlling secondary bacterial complication. Therefore the management of the case includes using broad spectrum antibiotics for secondary bacterial complication and nursing animal by providing proper ventilation and feeding appropriately with dietary helpful in boosting host immunity.

In conclusion sheep and goat pox is a highly contagious viral disease of small animals characterized by pyrexia, nodular lesion on the skin and in the internal organs. The disease cause high economic loss through morbidity and mortality of diseased animals. Proper prevention and control measure for sheep and goat virus is using a vaccine in disease endemic area and restricting animal movement between disease endemic and disease free area.

3.11. Case report on canine transmissible venereal tumor

Abstract

Canine transmissible venereal tumor is sexually transmitted tumor affecting canine species without preference to any breed, age or sex. A five year female dog was presented to veterinary teaching hospital of Addis Ababa University College of veterinary medicine on May 13/2021 with the history of bleeding and swelling of vulva which persists on the animal about a year. Up physical examination the dog's vulva was enlarged, red to pink in color and there was foul smelled blood was ooze through it. Vital body parameters reveal normal with 38.2 ^{0}C, 20 breathes/minute and 48 beats/minute. Cytological examination of fine needle aspirated sample was made and stained with Giemsa staining. The characteristic cells indicating canine transmissible tumor was obtained. Chemotherapeutic and radiation is no easily available for veterinary purpose and the dog was ethaunized. It recommended controlling animal movement and examination of dog when needed for breeding purpose.

Keyword: *Canine transmissible venereal tumor, Chemotherapy, Cytology, Dog*

Introduction

Canine transmissible venereal tumor is sexually transmitted tumor affecting canine species without preference to any breed, age or sex. Even though both sex dog more than one year age are affected, females are more affected because one infected male dog can transmit to many female dog while on sexual intercourse(Lapa *et al.*, 2012). CTVT also known as venereal granuloma, infectious sarcoma, and transmissible lymph sarcoma or sticker tumor of reticulo endothelial affect mainly the external genitalia of dog and sometimes internal genitalia. However, less commonly this tumor can be detected in the oral and nasal cavity, skin, rectum and conjunctivae by sniffing or licking(Hiblu, Khabuli and Gaja, 2019). The causes for CTVT is poorly understood, formerly most author agreed to be a virus and others C type virus particle, however recently they agreed that TVT arise from allogenic cellular transplants and abnormal cells of neoplasm transmitted. CTVT has no metasising characteristics except in young and immune suppressed animal(Ganguly, Das and Das, 2016).

CTVT transmitted during sexual intercourse, the transmission of the disease enhanced by extended period of sexual due to tying of the expanded male penis in the female genitalia and injuring of genital mucous after sexual intercourse. Transplantation occurs due to the intact tumor lacks ability to express MHC molecules this results in easy transfer of the tissue to healthy by contact.(Chanie, 2015)

Clinically CTVT occurs as a single mass of multiple tumors pendullar, nodular or multilobular form presented as cauliflower like appearance. In male the tumor is located on the caudal position of penis, on glans penis and in prepuce, whereas in female in the vestibule, protruding from vulva. Bloody vaginal and perpetual discharge, intermittent or persistent ulcerative skin lesion, weak penile exposure, genital enlargement and discharge on the genital area are findings in dog suffer from CTVT (Chanie, 2015).

CTVT can be diagnosed based on history and clinical finding, however based on this alone definitive diagnosis cannot be done. For definitive diagnosis cytology using aspirated fluid from the mass, histopathology and imprint biopsy specimen from vaginal discharge(Thangathurai *et al.*, 2008). On cytological diagnosis three cytomorphological type, which are lymphocytic, characterized by round cell with little granular cytoplasm with few intracytoplasmic vacuole, plasmacytic is broad cytoplasm, not centrally located nucleus and large amount of vacoulation and mixed (plasmacytic and lymphocytic) characterized by both type of cells. CTVT can be treated by surgical excision, radiotherapy and chemotherapy. Chemotherapeutic drugs known to be effective against CTVT are vincristine, cyclophosphamide, vinblastine, doxorubicin. Vincristine sulfate is the most commonly used of all (Thangathurai *et al.*, 2008).

On histopathology examination CTVT cells are round to polyhedral exist in string mixed with delicate conjuctival stroma upon staining with Hematoxylin and eosin. The tumor cells are arranged radially around blood and lymphatic vessels. These cells are found with high proportion of nucleus to cytoplasm ratio (Chanie, 2015)

The best option is preventing the disease by restricting domesticated dog to avoid contact with stray. Dog owners should examine their dog before mating for breeding. The other

most important ways are controlling the stray dog number, spaying and neutering of female and male dogs respectively (Abeka, 2019).

Case description

An adult female dog was presented to AAU-CVMA-VTH on May 18/2021 with the history of swelling of vulva and oozing of blood. The also said that the dog was give birth before one year of the start of the disease and bleeding was started about a year ago, however the dog was treated with antibiotics and it gets relief for month and bleeding continue. Up on physical examination there was a painful red to pink soft to hard movable swelling of vulva that open and blood ooze through indicated on figure 1 below. Vital body parameters were found normal 38.20C, 20, 48 temperatures, respiratory and heart rate respectively. Based on history and clinical finding the case was tentatively supposed to be Canine transmissible venereal tumor.

Figure 28: Indicates severely swelled vulva of dog

Laboratory finding and result

For confirmation of the tentative diagnoses cytology was made with fine needle aspirate sample taken from the mass of vulva and smear was made. The sample was then stained was Giemsa stain and seen under 100x microscope with oil immersion. Under microscope a cell with vocalized cytoplasm, disintegrated nucleus and which are different in sizes were

observed as indicated on the figure 25 below. The laboratory result indicates the indicative cells of TVT and the case is confirmed to be CTVT.

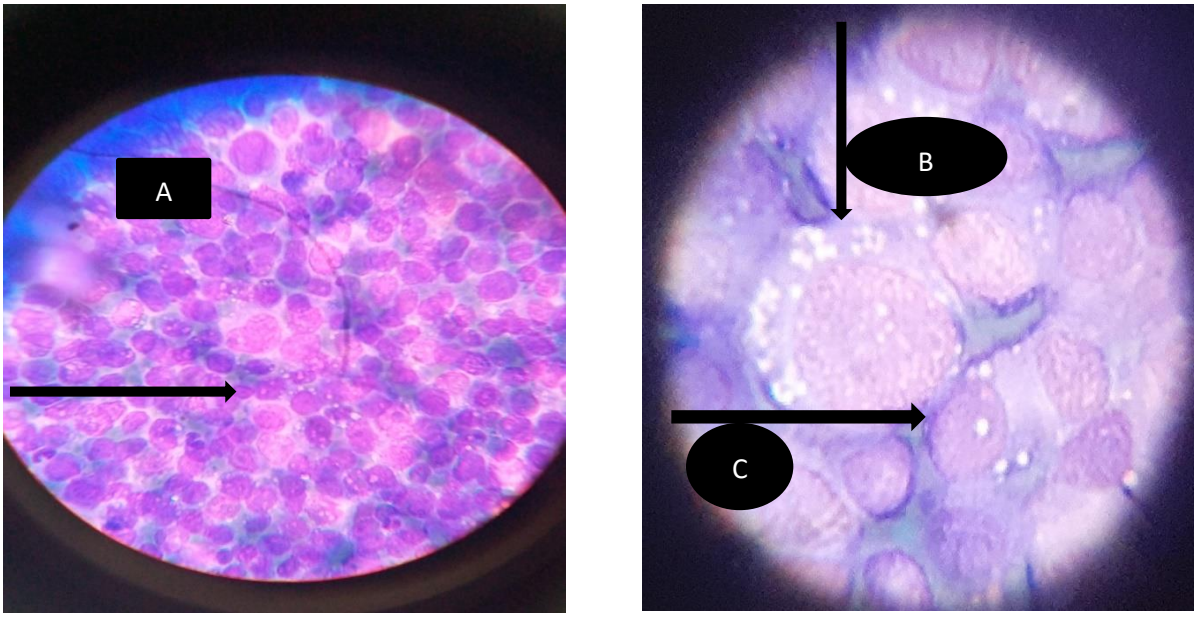


Figure 29: Indicates neoplastic cells

Unequally dividing nucleus (A), indicate intracytoplasmic and intranuclear vacuolations respectively (B and C)

Case management and treatment

Even though the case can be treated with chemotherapy and other methods due to the shortage of access for those chemicals or radiation we were not able to treat the dog rather to avoid animal suffered due pain and loss of blood we were euthanized the dog with thiopental 20mg/kg.

Discussion

CTVT is sexually transmitted through physical transplantation of contagious round cell affecting both genital and extra genital sites such as skin, lymph nodes, liver, lung and others. Other than sexual intercourse it can be transmitted by licking, scratching or sniffing of genital organs(Setthawongsin *et al.*, 2016). The present case of canine transmissible venereal tumor diagnosed based on clinical finding, red to pink colored swelling of vulva

and blood oozing through, history and cytological finding done by fine needle aspirate. Cytology plays a significant role in the diagnosis of CTVT because of the fact that it is time and cost effective. It also displays distinct nuclear and cytoplasmic features. The diagnostic approach of the present case is similar with made by (Ajayi *et al.*, 2018)(Da Silva *et al.*, 2014).

On present case based on history of unrestricted movement of dog outsider to the compound recognized as a risk factor for dog because it can have unrestricted sexual intercourse with stray dog this report is similar with the finding of (Behera *et al.*, 2012) who reported case of canine cutaneous metastatic transmissible venereal tumor at India.

In most of the cases reported by different author from different places they have successfully treated CTVT using chemotherapeutic agents such as vincristine, vinblastine, doxorubicin, L-asparaginase, and prednisone and also with surgery and chemotherapy(Behera *et al.*, 2012) (Setthawongsin *et al.*, 2019), . However in the present case the dog was not treated due to the inaccessibility of these chemotherapeutic agents and facility for radiotherapy.

Canine transmissible venereal tumor is a sexually transmitted disease of dog mainly affecting the external genitalia. This tumor can be diagnosed through clinical finding, cytological characteristic cell finding, histopathological finding as well through detection of tumor by polymerase chain reaction. This disease is treatable in most of the cases, except in case of metasising occurrence in rare case and in case when there is no access for chemotherapeutic agent as in present case.

Limitation

Inaccessibility of therapeutic agent to treat the case was major limitation.

Acknowledgement

I highly acknowledge Staffs of Addis Ababa University, in particular Dr. Tilaye Demisie for his contribution for laboratory confirmation of the case.

3.12. Flea Allergy Dermatitis in Local Breed Dog

Abstract

Flea allergy dermatitis or flea bite hypersensitivity is the most common dermatologic disease of domestic dogs. A four year old local breed dog was presented AAU-CVMA-VTH on April 13/2021 with the history of trauma on the back area of the dog. The owner also said the lesion occur on the dog weeks ago and the dog was scratching and lick itself, in addition there is flea on dog and in its house. Physical examination there was pruritic lesion on dorso-lumbar region extends to the tail head. There were also flea infestations on the skin and in the hair coat. The dog was febrile with 39.90C body temperature. Based on history taken, clinical signs observed (Dorsolumbar pruritus and lesions) and presence of fleas on the body of the dog, it is finally diagnosed as Flea Allergy Dermatitis. Penstrip1ml/20kg, Dexamethasone (Sokar Healthcare Pvt.Ltd. Gujarat India) 0.25 mg/kg/day and Ivermectin 0.2mg/k were used to manage the case. Gradually the clinical signs subsides (the lesion dry) and frequency of scratching also reduced as the owner said. Hairs also start to grow on alopetic area. In conclusion FAD is a dermatological disorder results while flea feeding on dog injects saliva containing histamine like compound that induce inflammatory reaction. The inflammatory reaction results in skin damage,, due development of pruritus and pyoderma. The effective control measure in the FAD in dog is control of flea on dog and in its environment.

Keyword: *Dog, Flea allergy dermatitis, Flea*

Introduction

Flea allergy dermatitis or hypersensitivity to flea is most common dermatological problem of domestic dog. FAD, usually caused by infestation with Ctenocephalides felis felis, is one of the more common allergic diseases in dogs(Halliwell, 1985). FAD occurs during warm and humid season when flea multiplication increases. FAD occurs when flea feeds on dog injects saliva containing histamine, proteolytic enzyme and anticoagulant, these proteins results in inflammatory reaction and immunologic responses are provoked, including immediate and delayed hypersensitivity reactions. Various late-phase IgE-mediated

responses and cutaneous basophil hypersensitivity reactions are developed. The most important effector function of eosinophils in allergic disease is the release of reactive oxygen species and toxic eosinophilic granule proteins that result in local propagation of inflammation and tissue damage (Wilkerson *et al.*, 2004).

Clinically FAD is primarily manifest on the caudal aspect of the animal, dogs. Infected dog scratch itself to inanimate objects these results in hair loss; erythema; pyotraumatic dermatitis; dull, coarse hair coat; hyperpigmentation; and/or lichenification may be observed affecting the dorsal lumbosacral region, tail base, caudomedial thighs, inguinal region, and umbilical fold. Other clinical findings are papules or encrusted papules, crusting, scaling, and, occasionally, fibropruritic nodules in association with affected areas(Chiara Brachelente, Ursula Sattler, 2006). Following the superficial lesions deep pyoderma develop most commonly. While closely examining the flea comb or adult flea can be obtained on the skin and hair coat. Some pets may even exhibit clinical anemia as a result of severe flea infestation. Pets that are aggressive groomers it may ingest adult fleas carrying the tapeworm Dipylidium caninum and may have segments of D. caninum in their feces(Diesel, 2017).

History and physical examination findings are the keys to making an appropriate diagnosis of flea allergy dermatitis. On physical examination includes clinical signs, presence of fleas or flea excrement, and intradermal test result. There is no breed or sex predilection, and flea allergy dermatitis can develop in animals of any age. Patients may exhibit seasonal or year-round pruritus, depending on their geographic location(Wilkerson *et al.*, 2004).

FAD can be treated by controlling flea on pets and on its environment. Use of insecticides and insect growth regulators with convenient dosage formulations and prolonged residual activity has dramatically improved owner compliance and helped eliminate recurrent infestations. The goals of flea control are elimination of fleas on pet(s), elimination of existing environmental infestation, and prevention of subsequent re-infestation. The first step is still the elimination of existing pet flea infestations. Elimination of those fleas currently established on the dog or cat is necessary to eliminate pet discomfort. The present

case describes the flea allergy dermatitis in local breed dog, history, clinical finding and intervention measure taken(Halliwell, 1985).

Case description

A four year old local breed dog was presented AAU-CVMA-VTH on April 13/2021 with the history of trauma on the back area of the dog. The owner also said the lesion occur on the dog weeks ago and the dog was scratching and lick itself, in addition there is flea on dog and in its house. Physical examination there was pruritic lesion on dorso-lumbar region extends to the tail head. There were also flea infestations on the skin and in the hair coat. The dog was febrile with 39.9^0C body temperature, 22 breaths per minute and 72 beats per minute, respiratory and heart rate respectively. History, clinical signs and presence flea leads the case to diagnose as flea allergy dermatitis. Figure below

Figure 30: Alopetic dog due flea allergy dermatitis

Case management and treatment outcome

The dog was treated by Penstrip (Interchemie werken “De Adelaar”B.V.,Holland) 1ml/20kg IM for consecutive three days, Dexamethasone (Sokar Healthcare Pvt.Ltd. Gujarat India) 0.25 mg/kg/day IM for consecutive two days and Ivermectin 0.2mg/kg subcutaneous stat were managed; the owner also informed to spray their house and the housing of dogs with diazonin. Gradually the clinical signs subsides (the lesion dry) and frequency of scratching

also reduced as the owner said. Hairs also starts to grow on alopetic area, lost on previous time.

Figure 31: Recovered dog from FAD

Discussion

Dermatitis induced by allergy to flea bites is a major clinical entity in dogs, particularly in warm, humid regions of the country where fleas exist in abundance. This allergic disease is a complex phenomenon that involves both, inflammatory cells and structural cells, such as fibroblasts and endothelium. Cytokines produced in response to specific antigens/allergens are important in controlling the function of the inflammatory cells and the isotype of antibodies produced by B-cells(Halliwell, 1985).

Flea allergy is a very common pruritic dermatological condition in the dog. This dermatitis occurs in young adult dogs of any sex. Clinical signs are usually more severe during the warm season. They are characterized by a pruritic erythematous papular eruption affecting the caudal aspect of the dog like dorsolumbar pruritus and lesions are characteristic diagnostic criteria. Diagnosis of canine flea allergy dermatitis relies on history of housing, physical examination and lesions and presence of flea is pathognomonic sign for flea allergy dermatitis. Clinical signs and lesion distribution are strongly suggestive of the diagnosis;

Dorsolumbar lesions and pruritus have been found, in many cases of flea allergy dermatitis which is agreed with the current clinical finding observed in the reported case (Ernest E. Ward, 2012). The current case is treated with penstrep, dexamethasone and ivermectin. Dexamethasone is to give relief for pruritic lesion as recommended by (Ernest E. Ward, 2012).

In conclusion FAD is a dermatological disorder results while flea feeding on dog injects saliva containing histamine like compound that induce inflammatory reaction. The inflammatory reaction results in skin damage, due to the development of pruritus and pyoderma. The effective control measure of FAD is control of flea on dog and in its environment.

3.13. Foot and mouth disease in heifer

Abstract

Foot and mouth disease (FMD) is a highly contagious viral disease of cloven hoofed domestic and wild animals. A local breed heifer was brought to Addis Ababa University College of veterinary medicine veterinary teaching hospital on Feb 12/ 2021 with the history of reduced in feed intake and excessive salivation. The owner also said there is a lesion between digits of the heifer and there was flies residing on it. Up on physical examination the animal was febrile with 39.7 ^{0}C body temperature and 68 beats/min and 32 breaths/ min of heart rate and respiratory rate respectively. In addition cow was emaciated, there was drooling of saliva and up on examination of oral cavity the heifers gum and tongue was sloughed and eroded. History, clinical finding and laboratory result indicates the heifer suffer from foot and mouth disease. For laboratory confirmation of the case nasal swab were collected and sent to sebeta research center and real time polymerase chain reaction were done and the test indicates it was positive for foot and mouth disease virus at cycle threshold value of 21.29 and 21.78. The heifer was treated with 10% oxytetracycline(Shanghai Thongren Pharmaceutical Co., Ltd, China) at dose of 10mg/kg was administered IM for consecutive five days and diclofenec sodium ((Sokar Healthcare Pvt.Ltd. Gujarat India) at 0.2mg/kg were administered for two consecutive days IM . gradually the heifer was comes to normal status (temperature subsides, lesion starts to heal) and two weeks later it

completely recovered. The owner was recommended to separate the heifer from rest of the herd and nurse. In addition to vaccinate their herd before the disease occur and to avoid mixing newly purchased animal immediately.

Keyword: *Foot and mouth disease, heifer,diagnosis*

Introduction

Foot and mouth disease (FMD) is a highly contagious viral disease of cloven hoofed domestic and wild animals. The disease cause greater economic loss through loss of animal, production loss and international trade ban in the country the disease is detected(Hemida, El-ghareeb and Al-hizab, 2019). Foot and mouth disease virus Aphtho virus single stranded positive sense RNA virus belongs to family picornaviridea viruses (Tesfaye, 2020). Foot and mouth disease is manifested in diseased animal by fever, vesicular eruption in the mouth (tongue and gum), teats, muzzle, nares and on feet/ coronary band or between the digits and excessive salivation. In young animals the disease causes degeneration of myocardial muscle of the heart which is known as “Tiger heart” (Sarker S, Talukder S, 2012)(OIE, 2013) .

Foot and mouth disease virus has different characteristic feature that contribute for the disease contagiousness, rapid multiplication and to affect extended range of domestic and wild animals. Of these characteristics which are ability to enter through different sites, small effective dose, short incubation period, excretion of the virus before manifestation of clinical signs, excretion of massive quantity of virus and ability of virus to travel long distance through the air and survivability(Aftosa, 2007). Foot and mouth disease comprises seven immunologically distinct serotypes; O, A, C, SAT1, SAT2, SAT3 and Asia 1. Under each serotypes there are greater than six tee five subtypes (Sarker S, Talukder S, 2012). However there is no cross protection different serotypes; vaccine for one strain does not provide protection to the other strains (Hemida, El-ghareeb and Al-hizab, 2019).

Foot and mouth disease virus can be transmitted by direct or indirect contact with infected animals. Most common route for FMDV transmission is by aerosol from infected animals. A

person in contact with infected animals can have sufficient FMDV in his or her respiratory tract for 24 hours to serve as a source of infection for susceptible animals. FMD virus has been isolated from around 40 people worldwide following a mild course of disease. Contaminated feeding staff (meat, milk, blood, glands, bones, cheese, etc.), contact with contaminated objects (hands, footwear, clothing), artificial insemination plays role in transmission of the virus (Rout and Sanyal, 2012).

FMD is diagnosed by clinical signs, FMD is suspected on the basis of clinical signs and macroscopic lesions on tongue and feet, with or without a history of contact between the herd and the infected animal, or report of FMD outbreak in the surrounding area. The presence of excessive salivation and lameness accompying lesion and erosion in the mouth and on the foot (Aftosa, 2007). The laboratory diagnosis is obtained by detection of antigen or isolation of FMD virus from clinical samples like vesicular epithelium of tongue and feet, nasal swab, serum, probang sample, milk are useful for detection of FMDV. The other interesting condition in diagnosing FMD is possibility differentiating vaccinated and naturally infected animals. This is possible because during natural infection the host species produce both structural protein and nonstructural, whereas in case of vaccination there is only production of structural protein (Verma and Kumar, 2012).

Foot and mouth is known to have zoonotic importance. The disease transmitted from infected animals to human being through improper handling of infected animals. In infected person it manifested as small vesicular eruption on skin with erosion of tissues and conjunctivitis (Verma and Kumar, 2012).

Case description

A local breed heifer was brought to Addis Ababa University College of veterinary medicine veterinary teaching hospital on Feb 12/ 2021 with the history of reduced in feed intake and excessive salivation. The owner also said there is a lesion on feet part of the animals flies were found on the feet. Up on physical examination the animal was febrile with 39.7 ^{0}C body temperature and 68 beats/min and 32 breaths breaths/ min of heart rate and respiratory rate respectively. In addition cow was emaciated, there was drooling of saliva and up on

examination of oral cavity the heifers gum and tongue was sloughed and eroded. There was also a lesion in feet. Tentative diagnosis was established as foot and mouth disease based on history and clinical findings.

Figure 32: Ruptured vesicle and ulceration of tongue and gum (A), lesion between digits (B)

Laboratory diagnosis and result obtained

For laboratory confirmation of tentative diagnosis a nasal swab was taken after external part of the nose is cleaned. Sterilized cotton tip swab inserted into the nose and rotated against the nasal wall and then put into five milliliter tube containing virus transport media (VTM) and then put in the refrigerator of minus twenty and two weeks later the sample transported to sebeta research institute and a polymerase chain reaction (PCR) was performed. At sebeta research institute it was confirmed the cases is FMD.

Case management and treatment outcome

The treatment of the heifer was aimed at reducing pain due the lesion and for secondary bacterial complication. 10% oxytetracycline(Shanghai Thongren Pharmaceutical Co., Ltd, China) at dose of 10mg/kg was administered IM for consecutive five days and to relief pain diclofenec sodium ((Sokar Healthcare Pvt.Ltd. Gujarat India) at 0.2mg/kg were administered

for two consecutive days IM . The owner was recommended to separate the heifer from the rest of the stock and nursing it with soft feed and provisioning enough water till it fully recovered. On the third days of treatment the fever subsides (from 39.7 to 38.5) and all other body parameter restores to normal. The owner reported that the heifer gradually starts to take a feed and two weeks later it completely recovered.

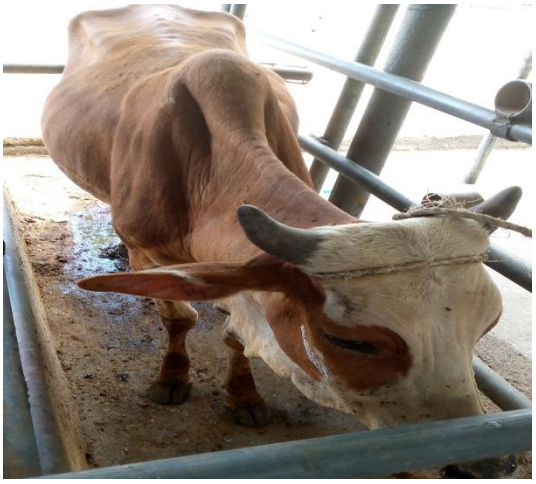


Figure 33: Recovered cow from FMD

Discussion

Foot-and-mouth disease (FMD) is a highly contagious viral epizootic disease of cloven-footed animals. The disease is mainly transmitted by aerosols; however to lesser extent it is also transmitted by ingestion of contaminated feed. Clinical findings of FMD are lesion in mouth on tongue and gum as well between digits found on the present case are similar finding with the report of (Sarker S, Talukder S, 2012), (Verma and Kumar, 2012) (Tesfaye, 2020).

Foot and mouth disease is diagnosed by clinical signs, pyrexia, anorexia, reduction of production of milk, smacking of lips, drooling, lameness, vesicular lesion on feets between digits, knicking of feet, lesion on the tongue and in oral cavity at all and death of young due to myocarditis.

As stated by OIE real time PCR is fast and sensitive diagnostic method. The three main combative programs used by governments against FMD are: 1) reduction of the risk of

introduction of the diseases into an FMD-free country by regulation of import products that may serve as vehicles of disease (prevention); 2) vaccination of susceptible livestock (control); and 3) slaughter of infected and exposed animals during an outbreak (control).

In conclusion foot and mouth disease can be prevented by reduction of the risk of introduction of the diseases into an FMD-free country by regulation of import products that may serve as vehicles of disease (prevention), vaccination of susceptible livestock); and slaughter of infected and exposed animals during an outbreak.

3.14. Case Report on Infectious Keratoconjuctitis in Goat

Abstract

Infectious keratoconjuctivitis is a contagious disease of animals. The disease characterized by excessive weeping of eye, blepharospasm, lacrimation, corneal opacity, corneal ulceration and finally temporary or permanent sight loss. It has multiple causative agents including mycoplasma conjuctivea, chlamydia species, staphylococcus aures and listeria monocytogene. A local breed adult goat presented to AAU-CVMA-VTH on April 26/2021 with the history of blindness of both eye. The owner said that the goat was delivered before two weeks before the start of this problem. He also said before losing the condition start with reddened and gradually it become cloudy and loss the sight. Physical examination revealed that the goat was slightly febrile with 39.7 ^{0}C and other parameters were found normal. There was bilateral corneal opacity, lacrimation and the goat move randomly which indicate slight loss of vision. To check if the cornea ulcerated we use fluorescein dye and it indicates the cornea of both were ulcerated, because it stained by the dye color. Based on history and clinical findings the case was diagnosed as third stage infectious keratoconjuctivitis. The goat was treated with 10% oxytetracycline for successive three days IM, diclofenac sodium stat IM and tetracycline eye ointment bid for a week. Three weeks later after treatment the goat was recovered and the eye found blue with very small scar left on cornea. In conclusion even though prevention of pinkeye is difficult due to impractical fly control activity, the disease incidence can be controlled through early management of the case and avoiding of corneal ulceration by feed or any inanimate object.

Keyword: *Corneal ulcer, Goat, Treatment*

Introduction

Infectious keratoconjunctivitis of sheep is encountered in many parts of the world. Also known as 'pink eye', it is an economically important and contagious disease of small ruminants. Emergence of clinical findings may begin unilaterally but is mostly seen bilaterally. In small ruminant the disease is bilateral and cause ocular discarge, epiphora, blepharospasm, corneal opacity, corneal ulceration and conjunctivitis (Fernández-aguilar *et al.*, 2017)The first indications of the disease are conjunctival hyperemia, serous lacrimation, increased blinking, photophobia, and blepharospasm. Keratitis and corneal ulcers develop in later stages of the disease and may lead to permanent visual loss (Akgül *et al.*, 2017).

The disease may be associated with Chlamydophila pecorum, Pseudomonas species, Staphylococcus aureus, mycoplasma conjunctivae in sheep and goat. Listeria monocytogenes has also been documented with keratitis in experimental infection of sheep (Firdaus *et al.*, 2014). There are several risk factors contributing to the occurrence of the disease. Immune statuses of the host, virulence of the pathogenic agent, environmental and secondary infection are the most important factors determine the occurrence of IKC. IKC frequently occur when goats exposed to severe stress such as introduced to the new herd, transportation or relocation, and very dry or cold weather. The infection spreads easily from one eye to the other, from animal to animal and by mechanical vectors. The most important vector is considered to be the face fly (Musca autumnalis)(Firdaus *et al.*, 2017).

There are four stages of pinkeye, with clinical signs ranging from conjunctivitis, excessive tearing, photosensitivity, ocular pain, squinting of the eyelid, corneal edema, and corneal ulceration to corneal rupture and blindness. Stage one of pinkeye is characterized by e excessive tearing and photophobia, frequent blinking, reddened sclera. Typically, a small ulcer develops in the center of the cornea that appears as a small white spot. On second stage signs progress corneal ulcer widens and cloudiness also increased. Blood vessels starts to grow outside cornea and the cornea become pink. On the third stage corneal ulcer progress and cover most cornea. The inner part of eye fills with fibrin and white blood cells. As the

disease progress on the fourth stage the ulcer extends completely through the cornea and the iris protrudes, remain adhered even after healing. All four stages are indicated on figure below.

Figure 34: Different stages of infectious keratoconjuctivitis

Source: (Strickland, 2017)

Presumptive diagnosis of pinkeye is usually sufficient based on ocular sign and systemic infection. However, microbial culture, cytologic evaluation and PCR could be done to confirm the disease(Gupta *et al.*, 2014). The treatment IKC should rely on test antibiotic susceptibility test to choose a drug effective against the causative agent. However in many condition oxytetracycline is the recommended drug for treatment of IKC with effective therapeutic effect as it has high concentration in corneal tissue(Firdaus *et al.*, 2017). Prevention of infectious keratoconjuctivitis is difficult as control flies is imperative, however the disease incidence and corneal irritation by inanimate material can reduced by avoiding such objects, clipping of grass and early management of the case(Strickland, 2017). This clinical case reports the management of infectious keratoconjuctivitis in a goat, where prompt diagnosis and treatments were able to resolve the case successfully.

Case description

An adult goat presented to AAU-CVMA-VTH on April 26/2021 with the of history of blindness of both eye. The owner said that the goat was delivered before two weeks of the start of this problem , he also said before losing the sight the eye start with reddened and gradually it become cloudy and loss the sight. Physical examination revealed that the goat was slightly febrile with 39.7 ^{0}C and other parameters were found normal. There was bilateral corneal opacity, lacrimation and the goat move randomly which indicate slight loss of vision. To check if the cornea ulcerated we use fluorescein dye and it indicates the cornea of both were ulcerated, because it stained by the dye color. Based on history and clinical findings the case was diagnosed as third stage infectious keratoconjuctivitis.

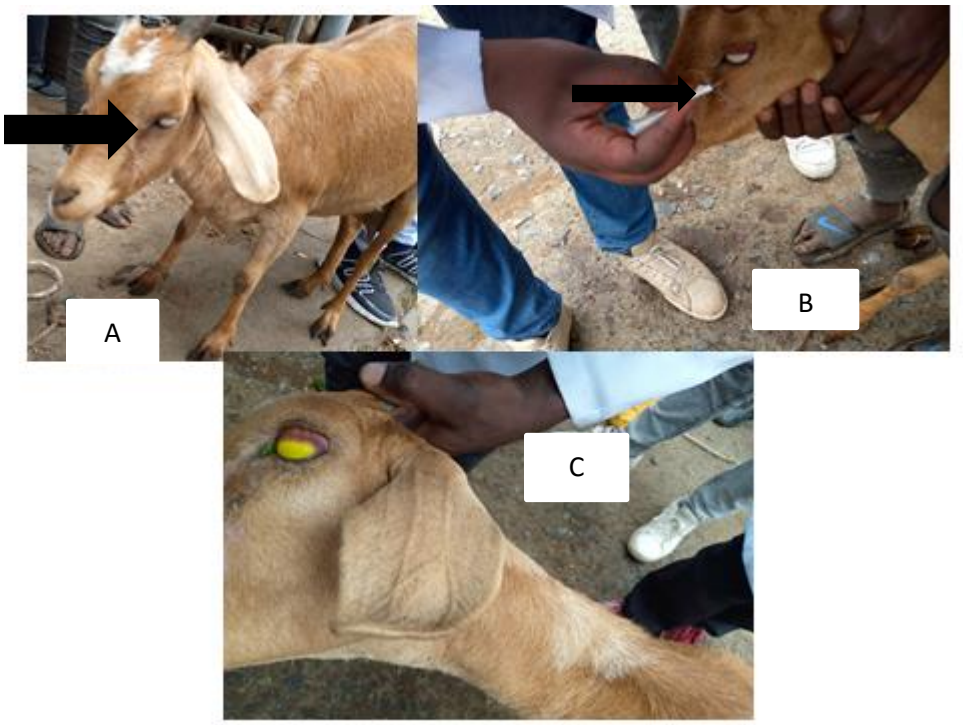


Figure 35: Corneal opacity (A), applying fluorescein dye (B) stained cornea indicating corneal ulceration (C)

Case management and treatment outcome

The goat was treated with 10% oxytetracycline for consecutive three days, diclofenac sodium stat and tetracycline ointment for bid for a week. Three weeks later after treatment

the goat was recovered and the eye found blue with very small scar left on cornea as shown on figure below.

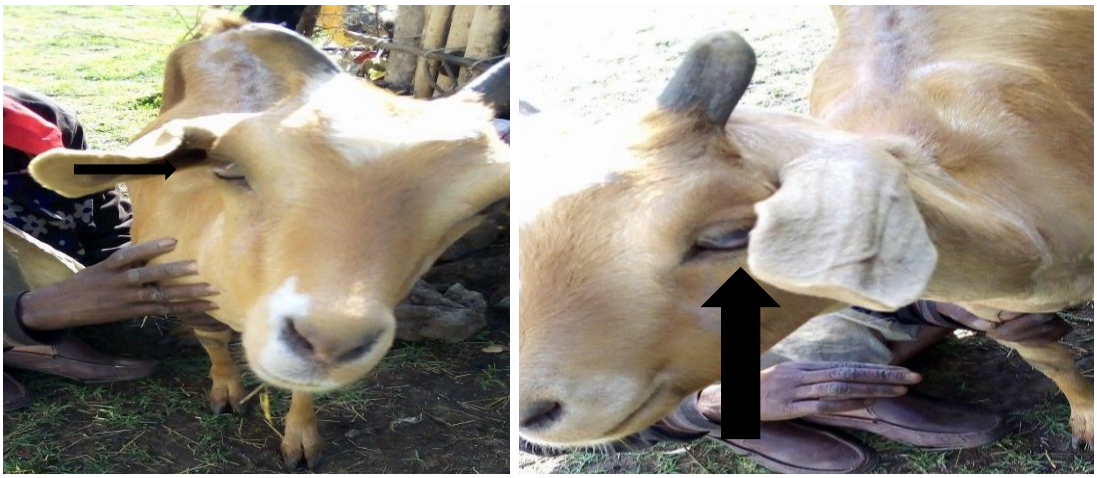


Figure 36: healed corneal with small scar

Discussion

Infectious keratoconjunctivitis or pinkeye is a highly contagious bacterial infection of the eye. Inflammation of the cornea and the conjunctiva are the two main characteristic of infectious keratoconjunctivitis.(Firdaus *et al.*, 2017). On the present case there was bilateral corneal opacity, lacrimation, corneal ulcer and the goat move randomly which indicate loss of vision. Based on history and clinical finding the case was diagnosed as infectious keratoconjuctivitis. In addition also based on the presented clinical finding it is also diagnosed as third stage infectious keratoconjuctivitis as mentioned by (Strickland, 2017) On the third stage corneal ulcer progress and cover most cornea. The inner part of eye fills with fibrin and white blood cells.

The goat was treated with 10% oxytetracycline for successive three days, diclofenac sodium stat and tetracycline eye ointment for a week bid. Three weeks later the was recovery in which the goat sight were restored with slight loss and the cornea healed with small white scar. Similar treatment procedure and outcome was used and obtained with previous case report (Firdaus *et al.*, 2014, 2017) even the stage of the disease were different.

In conclusion infectious keratoconjuctivitis is the contagious disease affecting different species of animal. The disease has an economic impact through reduction of body weight due to restlessness and cosmotic value which inturn reduces the animal cost at the market. Eventhough the disease prevention is difficult due to impractical fly control activity, the disease incidence can be controlled through early management of the case and avoiding of corneal ulceration by feed or any inanimate object.

Limitation

Due to limitation of the resource such media and antibiotic disk isolation of the causative agent and drug susceptibility test was not done.

3.15. Salmonellosis in Sheep

Abstract

Salmonella infections are an important cause of morbidity and mortality, thus remained an important problem both in developed and developing countries of the world. An adult local breed sheep was presented to veterinary teaching hospital, AAU-CVMA on Feb 13/2021 with history of reduced feed intake and mucus like feces which has bad smell. The owner also said that the sheep was given tomato and cabbage before two day start of diarrhea, the sheep about four days with this condition. The sheep was managed semi-intensively. While inspecting the rear part of the sheep was soiled and foul smelling mucoid diarrhea was comes through anus. In addition there was slight increase of temperature with 39.6 and heart rate 48bts/minute. Tentatively the case was diagnosed to be salmonellosis. For confirmation of the tentative diagnoses fecal sample was taken and after being enriched with tryptone soya broth and then cultured on XLD and other biochemical tests were done and all result indicate the causative agent was salmonella. The sheep was treated with sulfamethaxozone at dose of 1ml/16kg for consecutive five days and multivitamin 4ml for two days. From second day after the start of treatment there was change (frequency of diarrhea reduced, animal starts to come its normal condition. On the fifth day of treatment the sheep comes to its normal health condition and the diarrhea ceased and the appetite also restored. In conclusion salmonellosis a zoonotic bacterial disease in which the causative agent of the

disease found in the intestine of human and animal. Maintaining the hygiene and sanitary condition and removing asymptomatic carrier and stressful condition recommended for control and prevention of the disease.

Keyword: *Carrier, Salmonella, Sheep*

Introduction

Salmonella infections are an important cause of morbidity and mortality, thus remained an important problem both in developed and developing countries of the world. Although the incidence varies across countries, it is one of the most wide spread food borne zoonoses. Animals are the hosts and the principal vectors of zoonotic salmonellosis(Goodman et al., 2017). Salmonellosis is mostly associated with fever, anorexia, prominent diarrhea, and dehydration, which are secondary to acute necrotizing enteritis. Feces tend to be watery, with variable amounts of mucus, fragments of the intestinal mucosa or blood clots(Molla et al., 2006; Kusiluka, Kambarage and VETAID, 2016).

There are host specific and non-host specific salmonella serotypes. The host specific salmonellae include *Salmonella Paratyphi* (man), *Salmonella Gallinarum* (fowl), *Salmonella Pullorum*, *Salmonella Abortus* equi (horse), *Salmonella Abortus ovis* (sheep), *Salmonella Abortus suis* (pig) and *Salmonella Dublin* (mainly in cattle). Non-host specific salmonella is *Salmonella Typhimurium* (man, cattle, sheep, pig, horse, fowl and rodents). The major syndromes in livestock are enteritis and septicemia (Oloya et al., 2007). Acute enteritis occurs in adult animals and in young animals such as calves over a week old. It is characterized by profuse diarrhea, dehydration, depression, abdominal pain and anorexia (Prasad, Dharmshaktu and Venkatesh, 2016).

The prominent epidemiological factor is the common carrier status in animals. The absences of symptoms in the majority of infected animals and the technical difficulties in detecting such carrier before or during meat inspection make them a continuing source of contamination of the environment and hence of animal products(Kassaye, Hassen and Alemu Leja, 2015). The infection in a given host may or may not be clinically apparent in subclinical form, the animal may have a latent infection but harbor the pathogen in its lymph

node or it may be a carries and eliminate the agent in its fecal material briefly, intermittently or persistently. The primary sources of Salmonella organisms in food, including leafy green vegetables, are irrigation using surface water in rivers and dam lakes and the use of organic fertilizers made from poultry or livestock manure(Tarazi, Al Dwekat and Ismail, 2021).

Clinical salmonellosis can be diagnosed based on clinical sign and laboratory examination of the feces, tissue from affected animals, feed and water. Isolation of the causative agent by health professionals is needed for a definitive diagnosis. Faeces or blood cultures are used for isolating the bacterium in humans, and in animals and birds, faeces, rectal swabs and/or caecal contents are required. Ideally, fresh faeces should be collected, preferably without traces of urine. Samples should be prevented from drying out. A medium should be used for transporting swabs(Tarazi, Al Dwekat and Ismail, 2021).

Prevention and control of salmonellosis relay on maintaining the hygienic and sanitary condition of animal and its environment. In addition water and feed staffs should limiting from accessed by animal feces through fencing stream banks and watering holes. Feed sources should be Salmonella spp.-free. Store feed in rodent and insect-proof sealed containers. Other important measures are avoid mixing potentially infected and susceptible animals, Isolate newly acquired animals. During a herd outbreak, animals carrying bacteria should be identified and either isolated and treated, or culled. Contaminated materials should be disposed of. Vaccination can reduce the level of colonisation and shedding of the bacteria into the environment, as well as clinical disease. Vaccines are available for some serovars such as Salmonella dublin, S. typhimurium, S. abortusequi and S. choleraesuis, in some countries. Adequate colostrum intake is important in preventing disease in young animals. Antibiotics may help with overcoming an outbreak but will not eliminate carriers, and transmission of bacteria from an infected adult to the egg or foetus may result in new outbreaks and disease spread. The following is a case report on salmonellosis in sheep and its treatment and management outcome (APHA, 2018).

Case description

An adult local breed sheep was presented to veterinary teaching hospital, AAU-CVMA on Feb 13/2021 with history of reduced feed intake and mucus like feces which has bad smell. The owner also said that the sheep was given tomato and cabbage before two day start of diarrhea, the sheep about four days with this condition. The sheep was managed semi-intensively. While inspecting the rear part of the sheep was soiled and foul smelling mucoid diarrhea was comes through anus. In addition there was slight increase of temperature with 39.6 and heart rate 48 beats/minute. Based on history, clinical finding and laboratory result the case was diagnosed as salmonellosis.

Figure 37: Soiled rear part and mucoid diarrhea

Laboratory findings and its investigation

The fecal sample was taken from the sheep and sent to microbiology and parasitology laboratory of Addis Ababa University for further confirmation. Fecal floatation technique was performed for the detection of Emeria/Coccidian oocytes and the result was negative. The sample was enriched in Tryptone soya broth for 24 hours. The sample from the enriched media was transferred selenite F broth tube. At the end the sample from rappaport was sub cultured on xylose–lysine– deoxycholate (XLD) media. There was growth of the bacteria (salmonella) which was a black colony grown with red and yellow background was obtained as shown on figure below.

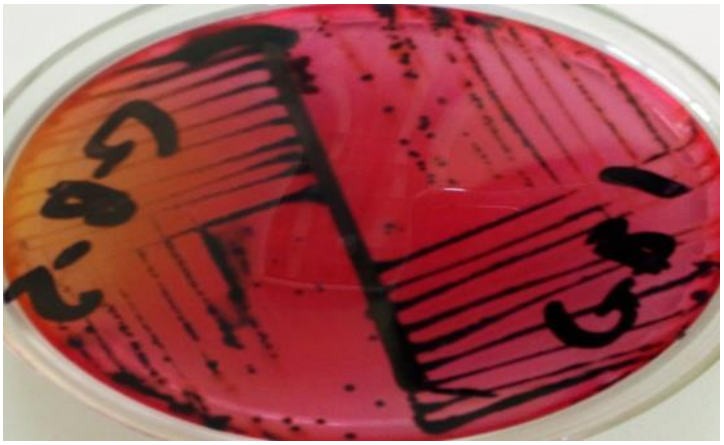


Figure 38: Indicate salmonella grown on XLD

Case treatment and management outcomes

The sheep was treated with sulfamethaxozone (manufacturer, brand) at dose of 1ml/16kg for consecutive five days and multivitamin (Aether center Beiging,biology, co ltd, china) at dose for two days. From second day after the start of treatment there was change (frequency of diarrhea reduced, animal starts to come its normal condition. On the fifth day of treatment it comes to its normal health condition and the diarrhea ceased and the appetite also restored.

Figure 39: Recovered sheep from salmonellosis

Discussion

Salmonella infections are an important cause of morbidity and mortality, thus remained an important problem both in developed and developing countries of the world. Salmonellosis is infectious zoonotic disease found in a range of animals including birds, caused by their exposure to species of Salmonella(Prasad, Dharmshaktu and Venkatesh, 2016). The bacteria are found in the intestines of humans and animals but are also widespread in the environment and are commonly found in farm effluents, human sewage and any material that is contaminated with infected faeces. The bacteria can survive for several months in the environment, particularly in warm and wet substrates such as faecal slurries(APHA, 2018). The disease can affect all species of domestic animals, and many animals, especially pigs and poultry, may be infected but show no signs of illness. The infection can spread rapidly between animals, particularly when they are gathered in dense concentrations. Carrier animals can maintain the infection within a herd and may continue to shed organisms contributing to repeat exposure of healthy and sick animals(Oloya et al., 2007).

On the present case the disease is clinically manifested by foul smelling mucoid diarrhea, appetite loss, fever and dehydration which was similar to the previous findings (Goodman et al., 2017; Chigerwe and Heller, 2018). In addition to clinical signs the case was confirmed

by culture of fecal sample for isolation the agent. The collected fecal sample first enriched on Tryptone soya broth and then sample from the enriched media was transferred selenite F broth tube. At the end the sample from rappaport was sub cultured on xylose–lysine–deoxycholate (XLD) media. There was growth of the bacteria (salmonella) which was a black colony grown with red and yellow background was obtained. In addition other biochemical tests were performed and all clearly indicate the agent was salmonella (Kassaye, Hassen and Alemu Leja, 2015; Goodman et al., 2017).

The sheep was treated sulphamethoxazone for consecutive five days and multivitamin. The treatment option used on the present case obtained successful result; the treatment option used on the current case is in agreement with (Kusiluka, Kambarage and VETAID, 2016).
In conclusion salmonellosis is a bacterial zoonotic disease of man and animals. Salmonella is normally found in the intestine of human and animals, and also in feces. The disease is asymptomatic in immune competent animal, however once infection established it become asymptomatic carrier of the pathogen and excrete the pathogen. Asymptomatic carrier animals become source of infection in the given herd or flock. Maintaining the sanitary and hygienic condition as well removing or isolation of asytomatic carrier or diseased animal is the recommended measure for disease prevention and control.

Limitation

Due to the limitation of resource and PCR does not done for detection of virulence factor. The (invA gene (responsible for cell invasion), enterotoxin gene (stn), and the pCT plasmid gene using commercially available primers.

3.16. Lumpy Skin Disease in Exotic Breed Ox

Abstract

Lumpy skin disease is a viral contagious transboundary disease of cattle affecting all age and breeds. On April 23/2021 an exotic breed ox was presented veterinary teaching hospital of Addis Abeba University to the college of veterinary teaching hospital with the history of swelling on the skin, reduction of feed intake and depression. The owner also said there

similar manifestation of the disease in neighbor herd and no history of vaccination.The ox was managed semintensively and it is used for drafting purpose. Clinical examination revealed the ox was febrile with 39.90C, increased respiratory rate 60breath/minute and 48beats/minute heart rate. There was also nodule under the on neck area and enlargement of prescapular lymph nodes. The ox was treated with 10% oxytetracyline Shanghai Thongren Pharmaceutical Co., Ltd, China) at dose of 10mg/kg for consecutive three days IM and dexamethasone (Sokar Healthcare Pvt.Ltd. Gujarat India) 0.2mg/kg/day stat IM. The owner was told to nurse the ox at home separating of the rest of the herd and vaccinated all normal animals. Two weeks later the ox backs to its normal state with disappearance of all sign except the nodule, it reduced but the scar lefts. In conclusion lumpy skin disease is one of the economical disease through affecting milk production, skin and hide quality, international trade and expenses for treatment and control and prevention. Therefore culling of affected animals, movement restrictions and compulsory and consistent vaccination have been recommended as control strategies.

Keyword: *Cattle, Lumpy skin disease, Vaccine*

Introduction

Lumpy skin disease is a viral contagious transboundary disease of cattle affecting all age and breeds. Clinically the disease is manifested by enlargement lymph node, generalized skin nodule and the nodule also occurred on the mucus membrane of gastrointestinal tract, respiratory tract and in the eye, inflammatory edematous swelling of limp and lamness (Molla, Frankena and De Jong, 2017; Krešic et al., 2020). Lumpy skin disease virus double standed belongs to poxviridea family, subfamily chordopoxvirinea, in the genus caprivirus together with sheep and goat pox virus(Molla, Frankena and De Jong, 2017). The CaPV homolog of G-protein-coupled chemokine receptor (GPCR) gene is one of the variable genes within the CaPVs and is a suitable target for genetic differentiation between members of CaPV(Krešic et al., 2020).

LSDV has an important economic impact on the cattle industry due to loss in milk production, infertility, abortion, damaged hides, and sometimes death because of secondary bacterial infections(Şevik et al., 2016). Even though the mechanism of transmission LSDV

is not clearly studied; it is thought that LSDV is transmitted among cattle by biting insects (such as mosquitoes, flies, and ticks)(Zekarias and Berhanu, 2018).

LSD is diagnosed by presence of typical skin nodule strongly indicates the disease. Other clinical signs include general malaise, ocular and nasal discharge, fever, and sudden decrease in milk production. In laboratory it can be diagnosed by detection of viral genome and antibodies(Tuppurainen, Babiuk and Klement, 2018). Prevention of LSD can achieve by quarantining of newly purchased animal, vaccination of animal, restricting animal movement and culling diseased.(OIE, 2015; Tuppurainen, Babiuk and Klement, 2018). This clinical case reports the management of lumpy skin disease in ox where supportive treatment of the case results in effective outcome.

Case description

On April 23/2021 an exotic breed ox was presented veterinary teaching hospital of Addis Abeba University to the college of veterinary teaching hospital with the history of swelling on the skin, reduction of feed intake and depression. The owner also said there similar manifestation of the disease in neighbor herd and no history of vaccination.The ox was managed semintensively and it is used for drafting purpose. Clinical examination revealed the ox was febrile with 39.90C, increased respiratory rate 60breath/minute and 48beats/minute heart rate. There was also nodule under the on neck area and enlargement of prescapular lymph nodes.

Figure 40: Nodule lesion on ox

Case management and treatment outcome

The ox was treated with 10% oxytetracyline Shanghai Thongren Pharmaceutical Co., Ltd, China) at dose of 10mg/kg for consecutive three days IM and dexamethasone (Sokar Healthcare Pvt.Ltd. Gujarat India) 0.2mg/kg/day stat IM. The owner was told to nurse the ox at home separating of the rest of the herd and vaccinated all normal animals. Two weeks later the ox backs to its normal state with disappearance of all sign except the nodule, it reduced but the scar lefts.

Figure 41: Recovered from LSD and arrow indicate the scar

Discussion

Lumpy skin disease is a contagious viral disease of cattle characterized by generalized skin nodule that may also found on mucus membrane of respiratory and gastrointestinal tract(Abera, 2019). The disease cause economic loss through reduction of milk, draft power and expenses for treatment and prevention of the disease(Morgenstern and Klement, 2020). On the present case there was skin nodule, fever, and swelled prescapular lymph node depression upon physical examination of the ox. Similar clinical sign were reported by (Morgenstern and Klement, 2020; Namazi and Khodakaram Tafti, 2021).

Even if LSD is primarily diagnosed by clinical sign manifested by the diseased animals; the confirmatory diagnosis of the disease are conventional PCR, real time PCR, virus isolation, virus neutralization and serological tests. Real time PCR is useful for differentiating sheep and goat pox viruses. In general molecular methods of diagnosis are the precise and reliable methods of diagnosis (Namazi and Khodakaram Tafti, 2021). The recent case was diagnosed based on history and clinical finding manifested by diseased animal.

The treatment of LSD are using a combination of antimicrobials, anti-inflammatory, supportive therapy and anti-septic solutions are only symptomatic and targeted at preventing secondary bacterial complications(Panel and Ahaw, 2015). 10% oxytetracycline and dexamethasone were used for as treatment of the present case.

In conclusion LSD is the one of the economical disease affecting domesticated and wild cattle. Prevention of the disease using vaccine is the recommended measure to reduce disease and death of susceptible animal.

3.17. Report on Epizootic Lymphangitis in Horse

Abstract

Epizootic lymphangitis contagious chronic fungal disease of horse, mule and donkey. The disease is clinically characterized by suppurative, ulcerative, pyogranulomatous dermatitis and lymphagitis as well lymphadenitis. An adult local breed stallion was brought to AAU-CVMA to SPANA on Jan 21/21 with major lesion start from fore limb that gradually extends to neck. The horse was used for cart. The owner also said the condition was seen about a month. There was ruptured and ulcerated lesion as well as nodule on the fore limb, chest wall that starts to extend to the neck. Physical examination of the stallion indicates normal parameters (38.3^0C, 24 breaths/min and 68 beats/ min of temperature, respiratory and heart rate respectively). The stallion was treated with 7% tincture iodine for six week by two day interval. 7% Tincture iodine was applied after the lesion was washed with savlon and the nodules were rupture to allow the drug to have an access to the pathogen for six weeks. In addition the owner recommended cleaning and avoiding repeatedly used beddings and other materials that could have been contaminated by the lesion. He also told to nurse the stallion with feed and reduce work load till it fully recovered. Six weeks later the stallion was recovered the wounds healed with scar left on the skin. The prevention and control of the disease highly recommended than treating diseased animals. Because the disease is not easily curable, especially the severe form of the disease is not treatable. Quarantining diseased and proper disposal of the contamined objects are highly recommended.

Keyword: *Equines, Epizootic lymphangitis, Iodine, Nodule*

Introduction

Epizootic lymphangitis a contagious chronic fungal disease of horse, mule and donkey. The disease is clinically characterized by suppurative, ulcerative, pyogranulomatous dermatitis and lymphagitis as well lymphadenitis (OIE, 2018). The characteristic lesion is seen mostly at chest wall, extremeties and neck, it can also found as ulcerative conjunctivitis palberal conjunctiva and multifocalpneumonia (Abdisa, 2017). The causative agent of epizootic lymphangitis is *Histoplasma capsulatum var*. *farciminosum* a dimorphic fungus found as yeast like in its parasitic phase and myliel with septate hyphae in its saprophytic phase. Even though previously *Histoplasma capsulatum var. farciminosum* was considered as equine disease, but the pathogen was detected in dogs, badgers and even humans(Enbiyale *et al.*, 2018).

The traumatised skin is either infected directly by infected pus, nasal or ocular excretions or indirectly by soil or contaminated harnesses, grooming equipment feeding and watering utensils, wound dressings or flies (OIE, 2018). After gaining entry through wounds, HCF invades subcutaneous tissue, sets up a local granuloma or ulcer and disseminates through the lymphatics to regional lymph nodes or, in severe cases, to other organs. Nodular lesions develop in the skin along the lymphatics and in the lymph nodes. These lesions eventually ulcerate and drain a thick, mucopurulent material containing yeast cells. Nodules occur wherever there is skin trauma (particularly under the harness and on the extremities). Horses that have a heavy systemic burden of fungi may succumb to pneumonia or failure of other affected organs.

The disease has generally three forms: ocular, cutaneous and pulmonary based on the route of entry. The cutaneous form of the disease, after which the disease was named, is the most common. Cutaneous form of epizootic lymphangitis affects the skin and lymphatic. Most commonly the lesions are found on extremities, chest wall, face and neck, but it can also found throughout body where wounds are found(Abdisa, 2017). Ocular form of epizootic lymphangitis occurs when the pathogen inoculated into eye mostly by biting flies. At the begging the of the disease watery ocular discharge that later progresses to unilateral or bilateral swelling of eyelid, papule or button like growth of conjunctiva and nictating

membrane. On the later stage the infection extends to periorbital tissue and there may be granulomatous reaction(Al-Ani, 1999). Respiratory cases are thought to occur through inhalation of the organism either as spores from the environment or through extension of infection from the external mucous membranes of the nares or from the nasolachrymal duct. Nodules formed from mucocutaneous junction of nose to lung parenchyma and respiratory signs are developed(Ameni, 2007).

Epizootic lymphangitis disease which caused by H.capsulatum var. farciminosum is endemic in some countries of West, North, Northeast Africa, East Africa (Ethiopia) and Asia including India, Pakistan and Japan, where it is mostly diffused in areas characterized by humid and hot climates(Seid, 2019).

Diagnosis of epizootic lymphangitis depends on the clinical sign, history of animals and laboratory confirmation. The clinical signs of Epizootic lymphangitis in horses in endemic regions are often the basis of diagnosis; however confirmatory tests should be followed. Several confirmatory tests have been described. Laboratory diagnosis of epizootic lymphangitis usually is by stained smears of the cutaneous exudate based upon demonstration of the typical yeast-like, double-contoured cells in pus collected aseptically from the lesion and confirmed by culturing the pathogen (Abdisa, 2017).

Epizootic lymphangitis is chronic disease that can heal spontaneous few weeks later after clinical signs are manifested. The use of intravenous iodide (NaI) is reported to brought satisfactory outcome and amphotericin B at 0.2mg/kg for three alternate day also mentioned to be successful for treatment. The scabs were removed and the areas cleaned daily with an iodine solution for seven days. The surgical treatment usually consists of opening the nodules and packing with gauze soaked in 7% tincture of iodine (Abdisa, 2017). The following case report is epizootic lymphangitis in local breed horse and case management outcome.

Case description

An adult local breed stallion was brought to AAU-CVMA-SPANA on Jan 21/21 with complain of lesion start from fore limb that gradually extends to neck. The horse was used for cart. The owner also said the condition was seen about a month. There was ruptured and ulcerated lesion as well as nodule on the fore limb, chest wall that starts to extend to the neck. Physical examination of the stallion indicates normal parameters (38.3^0C, 24 breaths/min and 68 beats/ min of temperature, respiratory and heart rate respectively). Based on history and clinical finding the case was tentatively diagnosed as epizootic lymphangitis.

Figure 42: Stallion suffer from epizootic lymphagitis

Case management and treatment outcome

The stallion was treated with tincture iodine for six week by two day interval. 7% Tincture iodine was applied after the lesion was washed with savlon and the nodules were rupture to allow the drug to have an access to the pathogen for two weeks. In addition the owner recommended cleaning and avoiding repeatedly used beddings and other materials that could have the fungus. He also told to nurse the stallion with feed that can restore the body condition and immunity, as well to reduce work load.

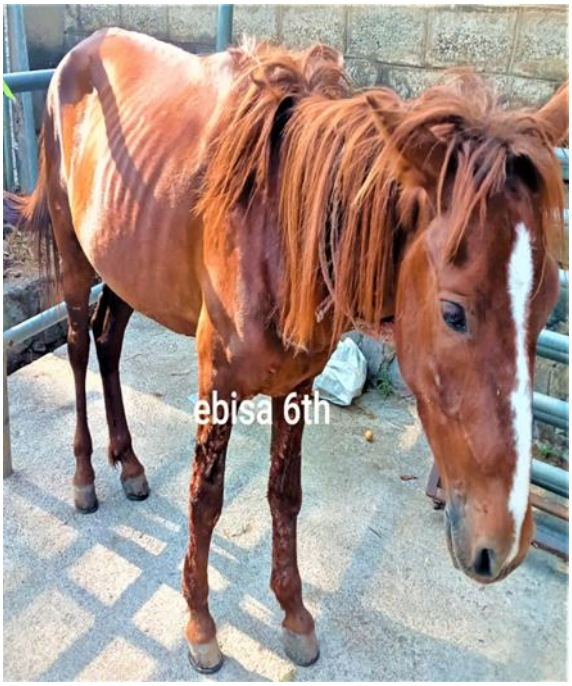


Figure 43: Recovered stallion from epizootic lymphagitis

Discussion

Epizootic lymphangitis is a debilitating fungal disease, caused by some isolates of Histoplasma capsulatum, which mainly occurs in equids. Its most common form is an ulcerative, suppurative, spreading dermatitis and lymphangitis; however, some animals can develop lesions in other organs, particularly the respiratory tract or eye (PLUNKETT, 1948). On the present case was diagnosed based on c the clinical finding, epidemiology of the disease and history. Even though the confirmation of the disease is make by microscopic

examination of yeast in the pus and serological tests, however the clinical sign of the disease is also one of the diagnostic way (Haider,2010).

The current case was treated by 7% iodine for two weeks by antiseptic wash of the lesion and applying on it directly by soaking with gauze. The stallion was recovered six weeks later with scar left over the skin. Similarly (Enbiyale *et al.*, 2018) stated 7% iodine treatment with surgical incision of the nodule could result in successful therapeutic effect.

In conclusion epizootic lymphangitis is a chronic contagious fungal disease of equines. It has greater economic loss by reducing the draft power and even death of diseased animals. Therefore prevention and control of the disease highly recommended than treating diseased animals. Quarantines and the euthanasia of infected animals recommended measure for control of the spread of the infecion. Premises and equipment must be thoroughly cleaned and disinfected. Care should be taken to prevent transmission on grooming equipment or harnesse.

3.18. Case Report On Dictyocaulosis In Cow

Abstract

Lung worm/ hoose/ husk/verminous pneumonia/parasitic bronchitis is an infection caused by parasitic worm caused by dictyocaulus species belonging to family dictycaulidae and metastrongylidae. On April 12/2021 an adult cross breed cow was presented to Addis Ababa University, veterinary teaching hospital with the history of reduced in feed intake, reduce in milk production, body condition and intermittent coughing that aggravated during cold time of the day. The owner also said that the condition is about a week. The cow graze outside on winter season and also feed at home (semiintensive management). Upon physical examination the cow was febrile with 40^0c, tachypnea with 68 respiratory rates and 48 beats/min. In addition the cow was highly emaciated with prominent ribs and pelvic bone. There was also abnormal lung sound (which rapid and shallow breathing) and the cow was also depressed. Based on history, clinical finding and laboratory result the case was diagnosed to be lung worm/ dictyocaulosis. The cow was treated with ivermectin, 20% oxytetracycline and dexamethasone stat. on phone follow up the owner said there was an

improvement in feed intake, production and even body condition. But two weeks later when I call to check the condition and give second shot of ivermectin she told me that she has sold the cow. In conclusion dicytocaulosis is parasitic infection respiratory disease particularly in that of young or naïve herd in their first exposure to grazing. Prevention of the disease rely on using vaccine when available or prophylactic antihelminth before exposure of young or naïve adults for grazing.

Keyword: *Antihelminth, Grazing, young*

Introduction

Lung worm/ hoose/ husk/verminous pneumonia/parasitic bronchitis is an infection caused by parasitic worm caused by dictyocaulus species belonging to family dictycaulidae and metastrongylidae. The dictycaulidae includes dictycaulus viviparous in cattle and buffaloes and dictycaulus filarial in sheep and goats and dictocaulus arnifield in equine(Yohannes, 2020). These worms are 5-10cm long and live in the trachea and bronchi. The metastorngylidiae are represented by at least three species in small ruminants. Protostlongylusrufisence a small worm (1.5-3.5 cm) found in bronchioles, mulleries capillaries (1.22.5 cm) which are located in the alveoli and cystocaulso creatus (2-5cm) found in the terminal bronchioles(Sargison, Dick and Studies, 1985).

Dictyocaulus viviparus is a pathogenic parasitic nematode that can cause verminous bronchitis. It typically affects young cattle during their first grazing season in temperate areas. Lung worms are widely distributed throughout the world providing nearly perfect conditions for their survival and development but are particularly common in countries with temperate climates, and in the highlands of tropical and sub-tropical countries. Disease varies in severity from sporadic coughing to acute cases with severe coughing accompanied by difficulty of breathing that a rapidly fatal outcome, depending on the number of larvae ingested and the immunity of the animal (Tolossa, 2019).

Dictyocaulus accompany direct life cycle. The adult females in the bronchi lay larvated eggs. The eggs are coughed up and swallowed with mucus and the L1 hatch out during their passage through the GIT and L1 are excreted in faeces. On pasture, the larvae molt into the

second stage (L2) and develop to the infective L3. Then it is ingested by the animal while grazing in the pasture(Yohannes, 2020). Cattle ingest the larvae, which then penetrate the gut wall, before migrating to and travelling through the lungs until they reach the airways, where they mature into adults. The period from infective larvae ingestion to egg production is three to four weeks. The passage of larvae through the lung, the presence of adults in the airway and the host's subsequent inflammatory response cause the clinical signs typical of this disease (Hayton, 2009).

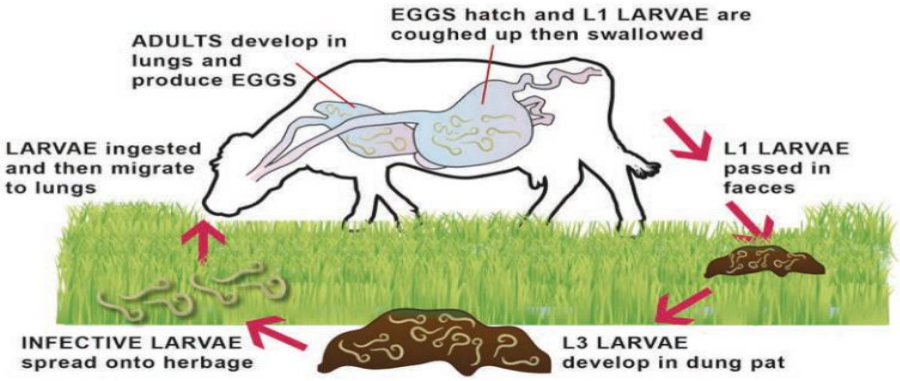


Figure 44: lung worm life cycle

Source: (Morgan, 2020).

The larvae of Dictyocaulus viviparus are the only nematode larvae found in freshly voided cattle feces uncontaminated with soil, so the demonstration of free larvae in such feces justifies a diagnosis of lungworm infection. The larvae may be found by fecal flotation, but the use of the Baermann technique is more accurate. The Baermann apparatus consists of a funnel clamped to a stand and fitted with a short piece of rubber tubing at the stem end. A pinch clamp on the rubber tubing retains the water in the funnel until aliquots are drawn off for examination(Al-qudah, Greve and Wass, 1995). Identification of lung worm L1 was first based on its movement or motility and its morphology(Lat-Lat, H.1, Sani, R.A.1*, Hassan, L.1, Sheikh-Omar, A.R.1, Jeyabalan, S.2, Hishammfariz, M.2, Rohani, K.2, Azlan, E.2 and Ramli, 2010).

However, we have to know that there may be false negative result when the infection is on prepatent period. Therefore laboratory confirmation of bronchitis can better confirmed by

detection of parasitic specific antibody by enzyme linked immune sorbent assay (ELISA)(Matthews, 2008).

All of the principle groups of anthelmintics licensed in cattle are effective against adult and larval D. viviparus; hence there is a wide choice of actives and formulations that can be used to treat clinical cases of lungworm(May *et al.*, 2018; Tolossa, 2019). The most effective way to control D. viviparus is to vaccinate animal. This should be performed in combination with strategic anthelmintic treatments to control other nematode species(Matthews, 2008). Lungworms are susceptible to the three major classes of benzimidazoles, levamisole and macrocyclic lactones (MLs). Macrocyclic lactone is the most effective of all; it is effective against wider developmental stages of the parasite, it has longer duration of protection because is not quickly absorbed and eliminated and lesser side effects than others. In addition broad spectrum antibiotics and anti-inflammatory drug are recommended for control of secondary viral, bacterial and mycoplasma infection. (Sargison, Dick and Studies, 1985; Hayton, 2009). The following is about dictyocaulosis in cow with case diagnosis and treatment finding.

Case description

On April 12/2021 an adult cross breed cow was presented to Addis Ababa University, veterinary teaching hospital with the history of reduced in feed intake and intermittent coughing that aggravated during cold time of the day. The owner also said that the condition is about a week and also reduce in milk production and body condition. In addition owner also said the cow graze outside on winter season and also feed at home(semiintensive management). Upon physical examination the cow was febrile with 40^0c, tachypnea with 68 respiratory rates and 48 beats/min. In addition the cow was highly emaciated with prominent ribs and pelvic bone. There was also abnormal lung sound (which rapid and shallow breathing) and the cow was also depressed. Based on history and clinical finding tentative diagnosis was made to be lung worm/ dictyocaulosis.

Figure 45: Cow with prominent ribs and extended neck while coughing

Laboratory investigation and findings

For laboratory confirmation nasal swab to was taken and for culture for bacteria detection and fecal sample for lung worm detection. The nasal swab was collected to tryptone soya broth and transport to microbiology laboratory of AAU-CVMA for bacteriological culture. Twenty four hour later the swab was cultured on maCconkey but there was no growth. The collected fecal sample brought to parasitology laboratory of AAU-CVMA and baerman technique was applied based on the principle of active migration of larvae from feaces suspended in worm water within twenty four hour stay. After twenty four hour stay the water sinked at the bottom was taken by the pipette and put on the slide covered with cover slip and observed under 10 x microscopes. A lung worm larvae was detected while observing under microscope.

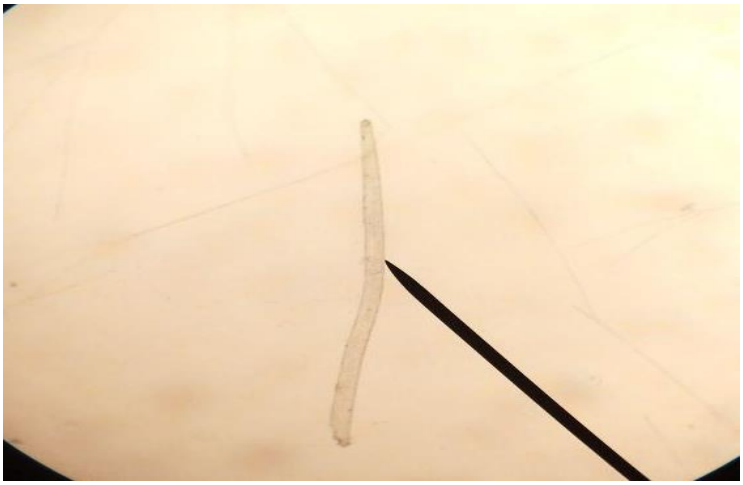


Figure 46: lung worm larva recovered by baerman technique

Case management and treatment outcome

The cow was treated with 20% oxytetracycline (manufacturer, country) at dose of 20mg/kg IM stat, dexamethasone at of 0.2mg/kg stat and ivermectin (manufacturer, country) at 0.2mg/kg stat. on phone follow up the owner said there was an improvement in feed intake, production and even body condition. But two weeks later when I call to check the condition and give second shot of ivermectin she told me that she has sold the cow.

Discussion

Lung worm or hoose is caused by a parasitic worm and although normally associated with being a problem in calves in their first grazing season it can, under certain circumstances, be a problem in subsequent grazing seasons. Outbreaks can be widespread, unpredictable and of economic significance resulting in reduced animal performance, milk yield and in severe cases animal losses(Hayton, 2009). On present case also similar history and clinical findings are obtained.

Diagnosis of parasitic bronchitis is based upon knowledge or implication of prior exposure to D viviparus in conjunction with the animals' grazing management and anthelmintic treatment histories(Anne and Carthy, 2018). The clinical manifestation of verminous pneumonia varies with the number of infecting worms. The most common sign are coughing and unthriftness which in endemic areas, is usually confined to young animals. In more severe cases dyspnoea and tenacious nasal discharge are also present. A typical sound 'husk-hoose' (hoose husk disease) is produce due to occlusion of passage of the bronchi. Increasing of Body temperature may occur when there is secondary bacterial complication(Amhara, 2019). The most important diagnostic measure of lung worm infection is through detection detection of larvae (L1) in the feces by using bearman technique, which done based on the principle of active migration of larva in which feces are wrapped in tissue or cheese cloth and suspended or placed in water contained in conical flask. The water at the bottom of the flask is examined for larvae after 24 hours(Matthews, 2008). The current case was diagnosed based on history, clinical finding and by detection of larva using baerman technique.

The cow was treated with broad spectrum antibioics, antiparasitic drug and analgesia , these treatment protocol is similar with (Matthews, 2008; Amhara, 2019; Morgan, 2020).

In conclusion parasitic bronchitis (PB) or verminous pneumonia in cattle results from infection with the lungworm Dictyocaulus viviparous. A disease occur frequently in young age calf during their first exposure to grazing. Control of dictyocaulosis is based on vigilance and prompt treatment whenever infection or clinical signs are detected. Prevention of the disease rely on using vaccine when available or prophylactic antihelminth before exposure of young or naïve adults for grazing.

3.19. Newcastle in hen

Abstract

Newcastle disease is a contagious bird disease affecting many domestic and wild avian species; it is transmissible to humans. It is a reportable disease to the World Organization for Animal Health (OIE) and is endemic in many countries in Asia and Africa. A hen from one of private farm presented to AAU-CVMA-VTH on April 13/2021 with the history of the sudden death, tortion of head and falling, reduction of feed intake and egg production. The owner also said the condition seen for about a week and from total flock about seven hens found dead and most of the hens shows similar symptoms. Up on physical examination the hen was depressed, torticollis of head, there were leg and wing paralysis and the hen drops deep greenish diarrhea. Based on history and clinical finding the case was diagnosed as Newcastle disease. For further examination of the case post mortem examination was done by the consent of the owner. Pinpoint haemorrhages on the tips of glands in the proventriculus, Haemorrhagic lesions in the intestinal wall (in the lymphoid aggregates) (as indicated in figure as follow) and congestion of trachea, with haemorrhages were also observed. The air sacs appeared inflamed cloudy and congested. Finally based on the presented clinical sign and post mortem lesion the case diagnosed as Newcastle disease. The owner recommended vaccinating the rest of the flock those not manifested clinical signs and separate diseased and avoid sharing of equipment between diseased and healthy flock as well as between other farms.

Keywords: *Newcastle disease, Vaccine, Avian*

Introduction

Newcastle disease is a contagious bird disease affecting many domestic and wild avian species; it is transmissible to humans. It is a reportable disease to the World Organization for Animal Health (OIE) and is endemic in many countries in Asia and Africa. The causative agent of this disease is the Avian Paramyxovirus-1 (APMV-1), also known as Newcastle disease virus. Newcastle disease virus (NDV), a member of the genus Rubulavirus, family Paramyxoviridae, subfamily paramyxovirinea. Nine serotypes of the genus avian paramyovirus are known, and nescastle disease virus is virus of serotype 1(Rown, Ing and Eal, 1999).

Newcastle Disease affects the respiratory, nervous and digestive systems and therefore can display a wide range of symptoms. Diarrhoea, neurological signs (Such as nervousness, depression, muscular tremors, drooping wings, twisting of head and neck, circling and complete paralysis), acute death, respiratory disease (coughing, gasping, sneezing and rales). If other coinfectious agents circulating, it can result in severe signs and egg drops often with peritonitis in laying birds can occur. All, or a combination, or just one of these may be present. Swelling of the neck and face may also be noted(Errington, 2021). Gross lesions are petechiae hemorrhages and ulcers with raised borders on the mucosa of the proventriculus, pneumonic lungs, and then hemorrhages in the trachea, air sacs, brain, and spleen (Messaï *et al.*, 2019).

The ND virus can be transmitted directly from diseased to healthy birds through oral and respiratory route. The infected birds shed ND virus is high quantities in their fecal droppings, nasal discharge, lacrimal discharge and exhaled air and can infect healthy birds(Miller and Poultry, 2011). The utensils, feeders, water drinkers, contaminated feed, feed bags, contaminated water, vaccinating and debeaking crews, human movements, eggs crates, cages, visitors, owners etc. can also transmit the virus from one place to another. Migratory birds and water fowl can also transmit ND. Transmission of ND is through horizontal means only. The newly hatched chicks in hatcheries may become infected with

contaminated shells, trays, chick boxes, etc. Due to aerosol mode of spread of disease the ND virus may affect all the poultry birds within the confined areas(Nakamura, Mase and Imai, 2013).

For a definitive diagnosis of ND, both virus isolation and laboratory characterization are necessary. Nevertheless, if the disease is known to be present in a given area, signs and lesions may be considered highly suggestive, especially for village chickens(Ratih, Handharyani and Setiyaningsih, 2017). Typical clinical signs are: a wasting and depression in the birds, with ruffled feathers; greenish white diarrhea; and, in survivors, the head turned to one side, a condition known as torticollis is very often seen, as are paralysis of the legs, wings or other neurological signs. Other typical characteristics of the disease include: rapid spread; death within 2-3 days; a mortality rate of over 50% in naive populations; and an incubation period of 3-6 days or, on rare occasions, 2-15 days (Getabalew *et al.*, 2019).

There is no specific treatment for Newcastle disease. Antibiotics can be given for three to five days to prevent secondary bacterial infections (antibiotics do not affect viruses). Increasing the brooding temperature for chicks by 5°F may help reduce losses. Prevention programs should include vaccination, good sanitation, and implementation of a comprehensive biosecurity program(Abdisa and Tagesu, 2017). The following case report is on Newcastle disease and its diagnostic approach.

Case description

A hen from one of private farm presented to AAU-CVMA-VTH on April 13/2021 with the history of the sudden death, tortion of head and falling, reduction of feed intake and egg production. The owner also said the condition seen for about a week and from total flock about seven hens found dead and most of the hens shows similar symptoms. Up on physical examination the hen was depressed, torticollis of head, leg and wing paralysis and the hen drops deep greenish diarrhea. Based on history and clinical finding the case was diagnosed as Newcastle disease.

Figure 47: A torticollis due Newcastle disease B: greenish diarrhea due to Newcastle disease

Post mortem Examination

Based on the consent of the owner the hen was taken for postmortem examination and the owner advised early vaccination of their poultry. Based on postmortem examination the case revealed out the Pinpoint haemorrhages on the tips of glands in the proventriculus, , Haemorrhagic lesions in the intestinal wall (in the lymphoid aggregates) (as indicated in figure as follow) and congestion of trachea, with haemorrhages were also observed. The air sacs appeared inflamed cloudy and congested. The postmortem finding revealed the pathological indications of Newcastle disease. Based on the history, outbreak occurrence, typical clinical signs and postmortem examination the case was finally diagnosed as new castle disease.

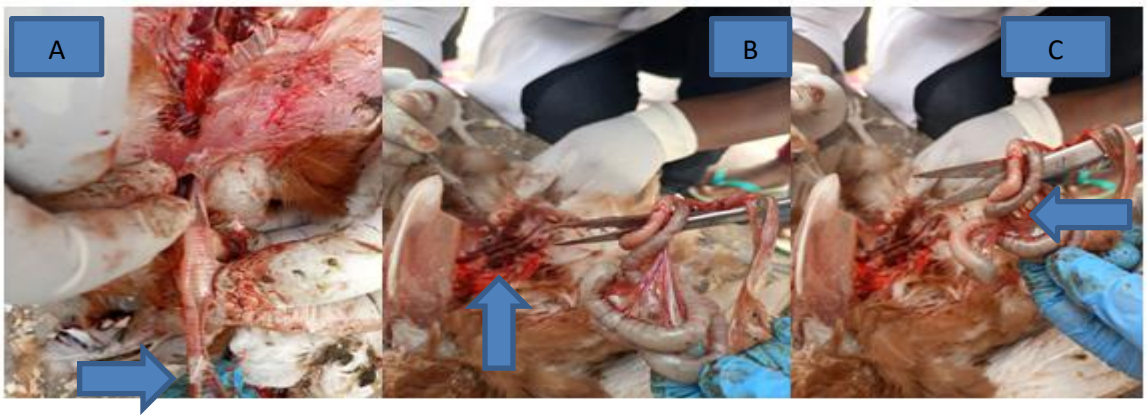


Figure 48: A: pin point heamorrhage in the treachea B: inflamed lung and air sacs C: heamorrage along the intestine

Discussion

Newcastle disease (ND) is one of the most important poultry diseases globally due to the substantial losses it cause in the poultry industry. It is a reportable disease to the World Organization for Animal Health (OIE) and is endemic in many countries in Asia and Africa (Dakouo *et al.*, 2020). On present case clinical findings such as paralysis leg and wing, greenish diarrhea, neck swelling and torticollis and post mortem finding of pin point heamorrhage in intestine, treachea and inflammation of lung are together used as diagnostic measure. Similar report has been done by (Getabalew *et al.*, 2019).

In conclusion newcastle disease virus is highly contagious and is spread via infected droppings and respiratory discharge between birds. Spread between farms is by infected equipment, trucks, personnel, wild birds or windborne - though this is less of a risk. The disease has no treatment, prevention of the disease can be obtained by vaccination.

3.20. Acacia Plant Poisoning in Goat

Abstract

Plant poisoning is due to either accidental ingestion of material eaten along with grass or willful consumption of poisonous plants when pasture is dry while most poisonous plants remain green all the year round. Local breed adult goat on May 14/2021 presented to AAU-CVMA-VTH with the history of found failed and salivate on the morning. The owner also said that one day before presentation date the goat ate too much plant which is in local name known as girar. The owner also said the goat was feed outside and at home also, but on the day exposed for that plant it was tied at home on the given plant. Upon physical examination the goat was unable to stand and failed, there were bloating, the eyelids were edematous and unable to open eye. The body parameters revealed subnormal body parameters 36^0C, very shallow heart beat and respiratory rate. The goat was treated with general antidote antropine sulphate (Reyoung pharmaceutical Co., Ltd No 6 Erlangshan road, China) at dose of 0.5mg/kg with half of dose given IV and dextrose (pharmaceutical factory P.L.C., Ethiopia). The goat starts to urinate too much greenish urine and become restless makes noisy sound. The owner was recommended to avoid that plant or prevent animals from consuming it and provide his animals with enough feed especially during dry season when green feed are not easily accessible.

Keyword: *Goat, Poison, Antidote*

Introduction

Plant poisoning is due to either accidental ingestion of material eaten along with grass or willful consumption of poisonous plants when pasture is dry while most poisonous plants remain green all the year round. It is also more likely to occur in animals which have been moved from one part of country to another(Gurmesa and Abdeta, 2019).

Noxious weeds and other plants can be toxic in a number of ways: they can contain chemical compounds that cause organ damage; they can cause physical injury to sensitive areas, such as the mouth or digestive tract; and they can contain substances that create contact dermatitis. Some toxic plants cause primary photosensitization directly related to a chemical agent, while others cause secondary photosensitization, a result of reduced liver function from a toxin. Toxin acts on any organs (liver, kidney, and lung) or system gastric, neurological or may act on different system at a time (Walelign, Mekuriaw and Sodo, 2016; Locken *et al.*, 2017).

Factors such as route of absorption, dose, physical and chemical nature of the poison, frequency of exposure, species, body size, sex, and general health status of the animal may influence the action of poisonous substances. In addition, chemical factors such as particle size, solubility, toxicity, absorption and excretion rate, affinity for body tissues or fluids, interaction with other drugs, and lacking development of metabolic pathway can have an impact on its occurrence. Liver or kidney insufficiency may enhance toxicity due to poor metabolism or slow excretion of toxicants. Alteration in gastrointestinal pH can change the ionization of drug or chemicals and influence their absorption; presence or absence of food in the stomach affects the toxicity of certain compounds (Desta, 2019).

The materials causing intoxication in animals classified as naturally-occurring or man-made. Naturally occurring intoxications includes mycotoxins, poisonous plants, snake venom, insects, minerals and these often become hazardous only when human intervention allows animals to access to them whereas the second (i.e. man-made toxic agents) includes

industrial products, like insecticides, herbicides and others. Plant poisoning of livestock can be diagnosed based on history, clinical syndrome observed, post mortem lesions, evidence of plant grazing and/or browsing, and remains of poisonous plants in the gastro intestinal tract (Desta, 2019). The chemical characteristic of plants constituent is of at most importance. Moreover, laboratory analysis of part of plant or detection of toxic substances in the animal's tissue leads to diagnosis of doubtful cases(Beyene *et al.*, 2014).

There is either direct or indirect loss due to plant poisoning. The direct losses are animal death, production loss, reduction in milk production and reproduction loss such as abortion, still birth, birth defect, reduction of libido, effect of oestrus and protracted gestation. Whereas indirect loss include control strategy (fencing, strategic grazing, supplementary feed and veterinary expense), temporary or permanent utilization of toxic plant, reduced usage of infested land (T.Kellerman, 1996).

When poisoning is suspected an action of removal of toxin from stomach (gastric lavage, laxatives and emetics), if the poison cannot be physically removed, sometimes activated charcoal can be administered by mouth to prevent further absorption from the gastrointestinal tract. These antidotes are classified into two general antidotes which is nonspecific in case where the exact cause of poisoning is not known and specific antidote used when exact cause of poisoning is known.

Case description

Local breed adult goat on May 14/2021 presented to AAU-CVMA-VTH with the history of found failed and salivate on the morning. The owner also said that one day before presentation date the goat ate too much plant which is in local name known as girar. The owner also said the goat was feed outside and at home also, but on the day exposed for that plant it was tied at home on the given plant. Upon physical examination the goat was unable to stand and failed, there were bloating , the eyelids were edematous and unable to open eye. The body parameters revealed subnormal body parameters 36^0C, very shallow heart beat and respiratory rate.

Figure 49: Failed and edematous swelling of eye lid of goat due to actia plant poisoning

Case management and treatment outcome

The goat was treated with general antidote antropine sulphate(Reyoung pharmaceutical Co., Ltd No 6 Erlangshan road, China) at dose of 0.5mg/kg with half of dose given IV and dextrose (pharmaceutical factory P.L.C., Ethiopia). The goat starts to urinate too much greenish urine and become restless makes noisy sound. In addition also it became kept silent and fant. While taking body parameter it became lower than before. However we continue to give both antropine sulphate and DNS, few hours later it comes to normal state and stands. The owner was recommended to provide much water than previous and avoid that plant or prevent animals from consuming it.

Figure 50: Recovered goat from acacia plant poisoning

Discussion

Toxic plants affecting ruminants are of major concern for both the practicing veterinarian and farmer. Various poisonous plants have known to cause bad effect on the livestock industry. Ingestion of poisonous plants by animals produces toxic effects like physical upset, loss of productivity and even death. Poisoning can occur either by accidental ingestion of plants with usual feed or by willful consumption of toxic plants when pastures are dry(Khan, Manjusha and S, 2019). The present case is diagnosed to be actia plant poisoning based on history of exposure to the plant (excessive consumption) and type of plant exposed for and clinical finding.

There are various plant species known to cause poisoning in livestock in Ethiopia. Acacia plant species are among known poisonus plant to livestock in the country (Beyene *et al.*, 2014; Desta, 2019). Similarly the clinical finding of bloat, hypersalivation, weakness and loud noisy were obtained on the present case. On the present case the goat was treated with dextrose and antropine sulphate antidote. The treatment was successful. The goat was recovered after excessive urination, through which the toxin could excreted and antagonistic action of an antidote (Dr Arpita Shrivastav Assistant and Rewa, 2005).

4. SUMMARY OF COMPLIED CASES

During the study period a total 21 animals with different age group, sex and species were examined and treated with different management outcomes. Different livestock disease were encountered.

Table 1: Animal species examined and outcome of the management

Animals species	Total (%)	Recovered	Died	Euthanized
Cattle	7(33.3%)	6(85.7%)	1(14.3%)	0
Goat	5(23.8%)	3(60%)	2(40%)	0
Sheep	3(14.3%)	2(66.7%)	1(33.3%)	0
Horse	1(4.8%)	1(100%)	0(0%)	0
Dog	4(19.0%)	3(75%)	0(0%)	1(25%)
Chicken	1(4.8%)	0(0%)	1(0%)	0
Total	21 (100%)	15(71.4)	5(23.8%)	1(25%)

Table 2: Examined and handled disease based on causative agent

Disease	No of affected animal	Percentage
Viral	9	42.9%
Bacterial	6	28.6%
Parasitic	3	14.3%
Fungal	1	4.8%
Plant poisoning	1	4.8%
Miscellaneous	1	4.8%
Total	21	100%

5. CONCLUSION AND RECOMMENDATION

In the present case reports, various livestock diseases that can cause greater economic losses to the livestock owner and country were encountered. During the study, viral, bacterial, parasitic, fungal, and plant poisoning cases were managed. Among these cases, viral diseases were the most frequently encountered followed by bacterial diseases. Proper case handling accompanied by proper diagnostic and treatment protocol could result in an effective outcome which has a great role in reducing loss of animal and production. Besides, lack of enough awareness about appropriate diagnostic, treatment and management of the disease were among the constraints faced during the study period. In addition, the absence of drugs for some cases, unavailability of inpatient case-handling unit and absence of nearby animal health center were challenges encountered during the study period.

Thus, based on the above conclusions, the following recommendations were forwarded:

- Awareness creation to animal owners about the impact of disease and the importance of early admission to the hospital,
- Provision and prescription of drugs to animals should be by the animal health professionals,
- Provision of inpatient service at institutions and public veterinary health centers for the animals with serious illness and brought from distant,
- Equipping veterinary health facilities with standard diagnostic equipment,
- Establishing livestock health centers in easily accessible areas

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ANNEXES

Annex 1: Clinical Case Recording Form

ADDIS ABABA UNIVERSITY COLLEGE OF VETERINARY MEDICINE AND AGRICULTURE Daily Clinical Activity Recording Form Date: ---------- Site/Name of the clinic:_____ Address:_____ Owner‟s name:_____ Address:_____ Phone number:_____ Patient identification:_____ Species:_____ Breed:_____ Sex_____ age:_____Color:_____ History: Past immediate:_____Immediate history:_____ environment:_____ management and feeding:_____ : Number of affected, no, at risk:_____ place of origin etc:_____ General physical examination: temperature:_____ heart rate:_____ respiratory rate:_____ , visible mucous membrane etc Systemic physical examination: detailed examination of the affected system Laboratory diagnosis methods employed_____ Tentative and definitive diagnosis_____, prognosis_____ Treatment: drug_____, dose_____, route_____,follow-up_____ Control & prevention: control methods prescribed, prevention and corrective management measures recommended_____

Annex 2: Clinical Examination Protocols, adapted from (Constable *et al*, 2018).

Recording of Rectal Temperature

Recording of body temperature of animal is most important in clinical diagnosis. Temperature should be recorded while the animal is at rest. Normally the temperature is taken per rectum. When this is impossible the thermometer should be inserted into the vagina. Clinical thermometer is placed in contact of the rectal mucosae and keeping it for one to two minutes.

Normal physiologic variations occur in body temperature and are not an indication of disease: a diurnal variation of up to 1°C (2°F) may occur, with the low point in the morning and the peak in the late afternoon. There may be a mild rise of about 0.6°C (1°F) in late pregnancy, but a precipitate, although insignificant, decline just before calving is not uncommon in cows and ewes and lower temperatures than normal occur just before estrus and at ovulation. The degree of change [about 0.3°C (0.6°F)] is unlikely to attract clinical attention.

- ✓ **Hyperthermia** is the simple elevation of the temperature past the critical point, as in heat stroke
- ✓ **Fever or pyrexia** is the state in which hyperthermia is combined with toxemia, as in most infectious diseases
- ✓ **Hypothermia**, a subnormal body temperature, occurs in shock, circulatory collapse (as in parturient paresis and acute rumen impaction of cattle), hypothyroidism, and just before death in most diseases.

The average resting temperature for the species and the critical temperature above which hyperthermia can be said to be present.

Species	Normal temperature	Critical point
Cattle	38.5	39.5
Sheep	39	40.0
Goat	39.5	40.5
Pig	39	40
Dog	39	-
Cat	38.5	-
Rabbit	39.3	-
Horse	38.0	39

Pulse rate

The pulse should be taken at the middle coccygeal or facial arteries in cattle, the facial artery in the horse, and the femoral artery in sheep and goats. With careful palpation a number of characters may be determined, including rate, rhythm, amplitude, tone, maximum and minimum pulse pressures, and the form of the arterial pulse. Some of these characters are more properly included in special examination of the circulatory system and are dealt with under that heading.

Site for Recording Pulse

Cattle: Middle coccygeal artery, ventral coccygeal artery under the tail, facial artery, maxillary and median artery; femoral arteries (in case of calf). Dog: Femoral artery on the inner side of thigh.

* Normal pulse rate in a Horse is 28-45 beats per minute.
* Normal pulse rate in a Dog is 80–120 beats per minute.
* Normal pulse rate in a Cow is 55–100 beats per minute.
* Normal pulse rate in a Sheep/Goat is 60-110 beats per minute.
* Normal pulse rate in a Rabbit is 20–150 beats per minute.
* Normal pulse rate in a Cat is 100–140 beats per minute.
* Normal pulse rate in a Swine is 60-120 beats per minute

Recording of Respiration Rate

In cattle average respiration rate per minute is 12-30. Sometimes it goes from 15-30. Variation occurs due to high ambient temperature, after exercise and it is normal. Respiratory rate is accelerated during fever and respiratory distress due to disease. Respiration rate should be noted when the animal is at rest. The type of respiration like costal, intercostal, abdominal, jerkey etc. are also to be noted. There is a ratio of 1:3 between respiration rate and pulse rate in healthy animals. Examination of respiration rate of animals is indicated for primary respiratory disease as well as secondary respiratory disease due to cardiac involvement, allergy and anaphylaxis.

* Normal respiration rate in a Dog is 15–30 per minute.

* Normal respiration rate in a Cow is 10–40 per minute.
* Normal respiration rate in a Sheep/Goat is 10–30 per minute.
* Normal respiration rate in a Rabbit is 50–60 per minute.
* Normal respiration rate in a Cat is 20–30 per minute.
* Normal respiration rate in a Swine is 8–18 per minute

Examination of Visible Mucous Membrane

This includes the examination of conjunctiva, buccal, nasal, vulval, vaginal and rectal mucosae. In normal and healthy condition of animals, the mucous membrane is moist and rosy in colouration.

Normal Colour of Conjunctiva of Various Animals

- Cattle and Buffalo – Pale pink Horse – Pale roseate
- Sheep and Goat – Pale pink
- Pig – Reddish tinged
- Dog – Roseate
- Cat – Pale.

The following changes of mucous membrane are seen in unusual conditions of animals.

- ✓ Congestion: Signs of fever and inflammation, systemic diseases and allergic sensitization. Paleness: Revealing anaemia, internal haemorrhage, hypoproteinaemia, excessive blood Loss and shock.
- ✓ Yellow discolouration: Signs of ecterus and hepatic disorder, jaundice.
- ✓ Pin point/Petecheal haemorrhages: Indicates septicaemia, surra, phosphorus and arsenic poisoning.
- ✓ Cyanotic changes: Bluish discolouration owing to dyspnoea, hypoxia, venous stasis, congestive cardiac failure, pleurisy and nitrate poisoning.
- ✓ Ulcerations: Typical ulcers on oral mucous membrane seen in FMD, PPR and RP. Pinkish: Equine infectious anaemia.

Examination of Eyes

Ophthalmic examination gives some clues in diagnosing some diseases.

- Sunken appearance: Indicates chronic wasting disease and dehydration.
- Pupillary reflex: Loss of pupillary reflex and pupillary response to light are seen in toxaemia and shock, poisoning and CNS disease.
- Dilatation of pupil: Seen in poisoning and shock. Corneal opacity,
- ulcers: Commonly occurs in mechanical injury or trauma. In canine it could also be due to canine distemper.

Palpation

Consistency of an organ or tissues or a part of the body can be felt by lying hand with gentle pressure. Tips of fingers and flat of the hand are mostly used for handling the tissues or organs. When tissue appears firm, hard, solid like muscle, that could be a neoplasm (tumour). When structure appears bone like consistency – it could be the exostosis or ossification of cartilage.

Hot and painful swelling, hard or soft could be the abscess (hard in initial stage, soft in maturity/ripened abscess).

 Doughy – Where soft tissues retain finger points, or causes pits on pressure – oedema and impaction of rumen.

 Cold and painless (fluctuating) – could be the cyst distended with gas (bloat), distended with food (impaction), distended with fluid (ascites), crepitating sound (Black Quarter or Subcutaneous emphysema). Abnormalities of abdominal and urogenital organs can be felt by rectal palpation.

Percussion

Striking of any part of the body with a short, sharp blow that enables underlying organs to vibrate and generate an audible sound is called percussion. Drum like sound audible from

rumen indicates tympanitis, dull resonance in impaction. Hyper resonant sound is observed while the lungs are filled with excessive air. Increased amount of gases will emit tympanic sound in abdomen. This method is useful in small animals than the large animals. Auscultation It means listening of various functional sounds

produced by some thoracic and abdominal organs by use of stethoscope for ascertaining the pathological condition of lungs, pleura, heart and certain parts of alimentary tract. It is useful for hearing peristaltic sounds during ruminal and intestinal contractions, listening sounds produced in course of normal functioning of trachea and lungs (dry rales in congestion and moist rales in exudation), cardiac sounds like cardiac murmurs in valvular disease, splashing sounds in pericarditis and hydro pericardium.

Annex 3: cELISA result of PPR obtained from NVI

	NATIONAL VETERINARY INSTITUTE		Document No. NVI -QMS - QF - 158
Title: Laboratory Test Result Report Form		Effective Date 15/04/2019	Issue No. 5 / Page No. 1of 1

Client Name: Dr. Bethel, Gishu & Tolosa Tel:

Client address: Bishoftu/DebreZeit

Test Report No: ***SE024/21***

Sample History	Animal species	Sample type	Number of Samples	Origin of animals	Sample. Ref. No.
	Shoats	Serum	3		***SE132/21***

Samples Collected By: Customer

Date of sample collection: 15/05/21

Date of Sample Submission to lab: 08/06/21

Date of Test Conducted: 14/06/21

Date of Test Report: 23/06/21

Test Method used

C-ELISA

Purpose: To Detect antibody specific to PPRV antigen

Criteria for positive result:

Test result:

Number of Positive Samples	Number of Negative Samples	Total Number Tested
3	**0**	**3**

ID of Positive samples: **BG, 90 & TPP**

Opinion and Interpretation: NA

**This test result is related only to sample Reference Number mention on this Laboratory test result report form*

Tested By:	**Checked By:**	**Approved By:**
Name: Wubet W/Medihin (Senior Researcher)	Abinet Legesse: (Senior Researcher)	Dr. BelaynehGetachew (TM)
Signature:		

The Federal Democratic Republic of Ethiopia

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Annex 4: Positive real time PCR result for FMD suspected cow