Diseases associated with poisoning in farm animals

Introduction

Poison (Toxicant)…

Is any substance that cause harm effect in a living organism(Structural damage or functional disturbances)

Toxicology….

Is the science which study the poisonous substances including, source of poisons , chemical and physical properties, factors that affected toxicity, mechanism of action ,clinical sings ,PM lesions ,diagnosis, treatment ,,etc

Reasons for poisoning ….are either

a-Accidental

b-Intentional متعمد

c-Iatrogenicعلاجي المنشا

Factors affecting toxicity …

1-Route of entry

2-physical state of the toxicant (soild, liquid ,gas,etc)

3-Speed of absorption

4-Dose

5-Sepecis ,age ,sex ,individual variation, ….

6-Duration of exposure

7-presence of other substances or drugs

8-General condition of the animal (healthy ,diseased)

General sings of poisoning …

1-Gastro intestinal sings …nausea, diarrhea, vomiting ,colicky pain

2-Unusual behavior or nervous sings

3-Salivation,Sweeting ,recumbency

5- Respiratory disturbances

6- Sudden death

Classification of poisons …

Simple classification can be made …included

1-According to toxic effect ….poisons either corrosives, irritant, narcotic and etc.

2-According to chemical or physical properties….poisons either organic ,inorganic ,gaseous ,nitrogenous and etc…

3-Accoriding to origin or source …poisons either chemical materials ,physical, plants(phytotoxins),fungus(mycotoxins),zootoxin(venom)..etc

4-According to chemical structures …poison either alkaloids, glycosides ,polypeptides, amines…etc

In general Suspicion of poisoning can be felt when illness occurs in a number of previously healthy animals, all affected at the same time and showing the same signs and necropsy findings,

Principles of treatment …

There are certain principles which apply to all cases of poisoning

1-Removal of the source of poisoning

2- Removal of the residual poison from the alimentary tract or skin

3-Provide the specific antidote

4-Effective supportive care, nursing, and convalescent care.

Sodium chloride poisoning

Sources of poisoning…

1-Ingested of excessive quantities of salt in water especially after change from fresh water and when the animals are thirsty.

2-Water accumulating in salt troughs منخفضات during drought periods

3- Animals previously deprived of salt may eat excessive amounts if suddenly allowed.

4-when prepared feed contain too much salt

Toxic doses…

-In horses,and cattle 2.2 g/kg BW

- In sheep 6 g/kg.BW

Pathogenesis…

1-Increase consumption of salt lead to gastro-intestinal irritation followed by dehydration and increase osmotic pressure.

2- Accumulation of sodium ions in tissues, including the brain,result in brain edema ,increase intracranial pressure and encephalomalacia may follow

Clinical findings…

1- Vomiting, diarrhea, abdominal pain, and anorexia, polydipsia polyuria accompanied by opisthotonos, nystagmus, tremor, blindness, paresis, and knuckling at the fetlocks.

2- A period of recumbency with convulsions follows and affected animals die within 24 hours

Necropsy findings…

1- marked congestion of the mucosa of the omasum and abomasum.

2- The feces are fluid and dark.

3- Animals that have survived for several days show hydropericardium and edema of the skeletal muscles

Treatment….

1- immediate removal of the toxic feed or water

2- Initially access to fresh water should be restricted to small amounts at frequent intervals
3- Supportive treatment includes alimentary tract sedatives when gastroenteritis is present and administration of isotonic fluids when dehydration has occurred
4- When there is evidence of cerebral edema it may be necessary to administer a sedative,and cerebral decompression may be attempted by the use of diuretics or hypertonic solutions injected parenterally

Cyanide poisoning…..

Etiology…

-Ingestion of plants that contain cyanogenic glucosides.(The glycosides are non-toxic but HCN may be liberated due to microbial digestion).
-The minimum lethal dose of HCN is about 2-4 mg/kg BW for cattle and sheep

Characteristics of plant with high cyanide content…

1- Plants grow rapidly
2-Plants after sprayed with herbicides especially 2,4-D
3- Wilted الذابلةand frost-bitten plants المتجمدة
4-Plants are growing in soil with a high nitrogen content and low phosphorus.

Characteristics of animals susptable to toxicity

1- Hungry animals access to dense plant growths
2-Sudden change from dry to green feeding
3- Increase rate of conversion of the glycoside to HCN in the rumen. which predisposed by

- Increase ruminal alkalinity
- Less grain content of the rumen

Pathogenesis …

1-Cyanide poisoning cause tissue anoxia (histotoxic anoxia)thus preventing cellular aerobic respiration and oxygen is retained back in the blood, and cerebral anoxia will follow .
2- Cyanides ingested in small amounts cause goiter because it prevent iodine intake by the thyroid tissues
3-Chronic cyanide in take cause Leucomyelomalacia (cystitis-ataxia syndrome)

Clinical findings…

1-in acute cases animal may die suddenly with dyspnea, anxiety, restlessness, hyperesthesia stumbling gait, tremor, recumbency, and terminal clonic convulsions with opisthotonos
2- The mucosa are bright red in color and become cyanotic in latter stages
3-in chronic cases visible enlargement of thyroid gland were seen

4- Leucomyelomalacia manifested by Urinary incontinence, سلس البول loss of hair, incoordination of the hind limbs with weakness, head shaking, fetlock knuckling, recumbency, and opisthotonos

Necropsy findings….

1-The blood is dark red with slow clotting time

2- Hemorrhage in the trachea and lungs with Patchy congestion and petechiation may be evident in the abomasum and small intestines

3- Subepicardial and subendocardial hemorrhages

4- A smell of' bitter almonds' رائحة اللوزالمرin the rumen is described as typical of HCN poisoning.

Clinical pathology…

Suspected plants or ruminal contents can be tested by picric acid test paper(rapid change in the color of the reagent paper from yellow to red indicates the presence of free HCN).

Treatment…

1- IV injection of a mixture of sodium nitrite and sodium thiosulfate (5 g sodium nitrite, 15 g sodium thiosulfate in 200 mL water

-for cattle 100 ml and for sheep 50 ml