Diseases o f the liver

Hepatitis

Definition It is the inflammation of hepatic cells. The cause of liver fibrosis & cirrhosis is the same as hepatitis, but the onset is slower & less acute than hepatitis

Diffuse diseases of the liver (Hepatitis)

- This term includes all diffuse degenerative and inflammatory diseases, which affect the liver.
- Clinically the syndrome caused by fibrosis of the liver which is slower and less acute than hepatitis.
- It may be infectious hepatitis or toxic (non-infectious).
- The toxic types are classified into acute (acute yellow atrophy) or chronic (cirrhosis).

Causes o f hepatitis:

(1) Toxic hepatitis:

1) Inorganic poisons including phosphorus /arsenic; gossypol; etc.

2) Bacterial toxins may play a part in producing hepatitis.

3) Extensive tissue damage occurs after bums, injury and infection.

(2) Infectious hepatitis: e.g. Salmonella, leptospira.

(3) **Parasitic hepatitis:** in massive liver fluke infestation and migration of larvae of ascaris.

(4) Nutritional hepatitis: e.g. cystine and methionine deficiency-

(5) Congestive hepatitis: by CHF which increases pressure in the sinusoids of the liver causing anoxia and compression of the surrounding hepatic parenchyma resulting in centrilobular degeneration.

- **Pathogenesis**
- The usual **lesion in toxic hepatitis** is centrilobular and varies from cloudy swelling to acute necrosis with a terminal veno-occlusive lesion in some plant poisonings.
- In **infectious hepatitis**, **the lesions vary from necrosis** of isolated cells to diffuse necrosis.
- In parasitic hepatitis the changes depend upon the number and type of migrating parasites. In massive fluke infestation sufficient damage may occur to cause acute hepatic insufficiency.
- **Fibrosis is the terminal stage of hepatitis**.

· Clinical findings

(1) Anorexia, indigestion, weight loss, bleeding tendency, ascites.

(2) Jaundice is present in icteric hepatitis.

(3) Vomiting, dark urine, in some animals.

(4) Constipation punctuated by attacks of diarrhoea and the feces are light in color than normal.

(5) Edema and emaciation.

(6) Nervous signs, dull, depression, hepatic coma due to hyperexcitability and convulsions.

(7) Dummy syndrome in which affected animals push with the head, do not respond to stimuli and may be blind.

(8) Photosensitization in animal fed on green fodders and exposed to sunlight.

(9) Subacute abdominal pain (arched back and pain on palpation of the liver).

(I 0) In chronic hepatitis the signs developed slowly and persist take a longer periods.

(11) Ascites and dummy syndrome are more common in chronic than acute form.

Diagnosis:

It is based on symptoms, radiography, liver function tests and biopsy.

Differential diagnosis

(1) Encephalopathy as jaundice or photosensitization are present.

(2) Acidosis by history and clinical examination.

Treatment

(1) Oral or IV injection of glucose (25 or 40%), vitamins B, C, K, A.

(2) Keep the bowel open with easily digestible food & mild laxative.

(3) Diet high in carbohydrate, calcium and low in protein, fat as much protein may lead to ammonia intoxication.

(4) Oral antibiotics.

(5) Amino acid mixture specially those containing **methionine and choline**.

(6) Digestive aids for dogs as enzymes, liver extract, egg yolk.

(7) Hepatic preparation: sachet (sorbit, sorbitol, sorbosan). Ampules as Cholephytol (Hepaton, Dioron, etc).

(8) Digestive preparation as Digestion (Syrup), or tablets as Zymogen Forte, polyzyme , panzymogen.

(9) Inject 10% immunoglobin 0.02ml / Kg BW, IM, in viral

- hepatitis

Focal diseases of the liver

(1) **Hepatic abscess:**

- Local suppurative infections of the liver do not cause clinical signs o f hepatic dysfunction unless they are metastatic and massive .
- They cause local pain on palpation or percussion over the liver.

(2) Hepatic tumours:

- Metastatic lesions of lymphomatosis in calves are the commonest neoplasms known in the liver of animals.
- They produce some abdominal pain by stretching the capsule of the liver but they produce no signs of hepatic dysfunction.

Affections of the gall bladder Cholecystitis and cholangitis

Definition: It is the inflammation of the gall bladder and bile ducts:

- These arise from infections ascending from the duodenum and are possible as the result of blood-borne metastasis, but all these things are rare in animals.
- **Cholecystitis** also results from the chemically irritant action o f the retained and concentrated bile when the escape of bile is prevented by pressure upon or swelling of the bile duct.
- If the passage of bile to the gall bladder is prevented by swelling of the cystic duct or other obstruction, the epithelium o f the gall bladder secretes a clear watery fluid, filling the cavity with what has been called (white bile)

Diseases o f peritoneum

Peritonitis

Definition: It is an inflammation of peritoneum, accompanied by abdominal pain, tenderness & rigidity of abdominal wall, faecal stasis, fever & toxemia.

Acute diffuse peritonitis is more common in dog, horse while chronic type occurs in cattle.

Physical causes:

(1) Injury or rupture of any part of GIT e.g.

1) Stomach & intestine (Penetration by foreign body, traumatic reticulo-peritonitis or rupture due to acute dilatation or obstruction).

2) Rumen, cecum (Trocarisation, faulty passage of puncturing needle in horse).

3) Abomasum (Rupture or puncture of ulcer).

4) Ulcerative colitis.

5) Rectum (Penetration or mpture during calving, rectal examination, enema).

(2) Injury or rupture of some parts of urogenital system e.g.

- Urinary bladder ,uterus, vagina (During dystocia or coitus or faulty catheter) and or pyelonephritis.

(3) During injury, wounds or accident of abdomen.

(4) During traumatic peritonitis or intraperitoneal injection using contaminated needle.

(5) Surgical (During laparotomy, casteration, herniotomy, etc).

Chemical causes:

(1) Irritant & foreign substance (Antiseptic, gloves, etc) during laparotomy.

(2) Bile & urine after injury o f biliary or urinary tract.

(3) Hypertonic or non-sterile solution injected in peritoneum.

(4) Semen enters peritoneum through accident during artificial insemination.

Infectious causes

(1) Suppurative lesions of liver, spleen, pancreas, prostate, testicle, spermatic cord, mesenteric lymph nodes, kidney, lung, pleura.

(2) Bacteria: (TB, Actinobacillus, Corynebacterium pyogenes, bacteremia, septicemia, pyemia, etc).

(3) Virus: Haemophilus suis in pig.

(4) Mycoplasma.

(5) Parasites as strongylus vulgaris, esophagostomum. Habronema & Gastrophilus sp causes gastric rupture or erosion.

Factors operate in the pathogenesis of peritonitis:

(1) **Toxemia** due to microbes & tissue damage, lead to death within one or two days. Rupture of GIT lead to endotoxic shock, death within 2 to 3 hours.

(2) **Hypovolemic shock** due to enter of GIT or urogenital content in peritoneum or due to hemorrhage.

(3) **Dehydration**, decrease serum Na & K levels resulting in muscular weakness.

(4) **Irritant o f peritoneum** lead to hyper followed by hypomotility o f gut, paralytic ileus, & constipation.

(5) Microbes cause peritonitis, exudate formation which coagulate causing adhesion o f abdominal organs.

(6) Inflammation of peritoneum, irritating nerve ending causing continues pain & reflexly cause rigidity o f abdominal wall & arched back.

Symptoms:

[1] Peracute difuse peritonitis

(1) Toxemia occurs in cows after calving or GIT rupture.

(2) Severe weakness, depression, circulatory failure, recumbent, coma & subnormal temperature.

(3) Death occurs within 1-7 days in severe toxemia.

[2] Acute diffuse peritonitis:

(1) Animal grunts when move ,eat, urinate, defecate, lie down.

(2) Animal walks with caution, when forced to do.

(3) Elevated temperature (39.5-41.5°C), pulse (double) & respiration (with dyspnoea & absence of abdominal movement).

(4) Enlarged abdomen, tenderness o f abdominal wall, muscle rigidity & abdominal pain which is more severe by palpation & percussion in horse, dog, less in cattle.

(5) Pain is clearer in horse, It includes bellowing, grunting & grinding of teeth.

(6) Horse tries to lie down while cattle remains standing with great care to move or lie down & walks with short **steps.**

(7) Animal stands with arched back, muscular rigidity and closed feet under the body with lowering of head & neck downward.

(8) GIT motility (rumen or cecum) is reduced or absent. It is observed by palpation or auscultation.

(9) Feces are hard, dark with mucous & foul odor causing rectal tensemus & constipation, later on tympany may occur. Rectal examination may be negative or only mucous is present.

(**10)** Bilateral lacrimation, tearing, purulent discharge **may** be occur.

(11) In toxemia, severe weakness, depression, circulatory failure & death may be occur, within 24-48 hours in acute, 4-7 days in less acute, 2-15 hours in peracute.

[3] Acute local peritonitis:

(1) Similar, but less severe, to acute diffuse peritonitis.

(2) Pain is localized in small area.

(3) Arching back, disincline to move.

(4) Temperature & pulse are slightly affected.

[4] Chronic peritonitis:

(1) It takes a long course (some months).

(2) Loss o f appetite, slight rise of temperature & mild colic.

(3) Emaciation & tenderness of abdomen.

(4) Rectal examination reveals signs o f visceral adhesion.

(5) Distended abdomen, accumulation of fluid in abdominal cavity.

Clinical pathology:

(1) Leucopenia (2000 to 3000 leucocytes per c /mm) in peracute cases.

(2) Neutrophilia in acute diffuse cases.

(3) Normal WBC in acute local & chronic cases.

(4) Peritoneal fluid exudates has high specific gravity (more than 1.017), high protein content (more than 3.05 g/dl), high total nucleated cell count (5000 to 100000 ml), macrophages, non degenerative neutrophils, offensive odor

& turbid color.

• Prognosis:

Local peritonitis is more favorable than peracute or acute diffuse peritonitis.

Treatment

(1) Complete rest, treat the real cause.

(2) Stop oral feeding for two days but 5% glucose IV is used.

(3) Broad spectrum antibiotics.

(4) Tranquilizer or sedative to relief pain.

(5) Injection o f calcium, vitamins B complex, A & C.

(6) Surgical drainage of peritoneal fluid.

(7) Slowly IV glucose 5% after addition o f atropine sulphate, (Sedative), novalgin (Analgesic) & terramycin Antibiotic).

Ascites

Definition:

- **It is the accumulation of transudate fluid in the sac of peritoneum.**

- **Causes:**

(1) **Passive congestion due to disturbances in blood circulation in cases of:**

1) Congestive heart failure, chronic alveolar diseases.

2) Obstruction in portal circulation in cases of liver cirrhosis.

3) Portal congestion resulting from pressure by tumor, enlarged lymph nodes, fasculitasis. It increases hydrostatic pressure & decreases plasma colloid osmotic pressure.

4) Renal insufficiency which lead to excessive loss of protein & retention of sodium.

(2) Hypoproteinemia & Hypoalbuminemia in wasting diseases such as TB, chronic nephritis, malnutrition, liver diseases or heavy infestation with parasites.

Symptoms

(1) Appear slowly & gradually with gradual loss of appetite & body weight.

(2) Gradual & symmetrical distension & swollen of abdomen. Finally becomes barrel shape & pear like appearance as the abdomen distended downward with hollow flank.

(3) The accumulated fluid varies in position by gravity with moving of animal.

(4) Swelling of abdomen is not hot or pain.

(5) Palpation & gentle percussion on one side of abdomen, fluctuation occurs & a wave or thrill can be felt by the other side. It may be felt per rectum in large animal.

(6) Tachycardia & engorgement of abdominal blood vessel.

(7) Difficult & wholey costal respiration.

(8) Later on, poor condition, dehydration and anemia may be occur. If Mucous membrane becomes yellow, prognosis will be unfavorable with short course & ended by death.

(9) Puncture o f abdomen, transudate is obtained.

Clinical pathology

Collect fluid from peritoneal cavity (Transudate): It is a clean, watery fluid, have low specific gravity (1.010), low protein content (1.0 g/dl), no neutrophil, no mesothelial cells, total nucleated cell count less than 1000/ml.

Diagnosis & Differential diagnosis:

(1) Ascites: Gradual enlargement of abdomen, contain noninflammatory fluid (transudate). Dyspnea occurs on raising the hindquarter, fluid thrill on tactile percussion.

(2) Peritonitis: Rise of temperature, abdominal pain (increased by percussion), tender abdomen with hot & painful swelling (contains inflammatory fluid, exudate), paralytic ileus (constipation), Cow disinclines to move or lying down so cows stand during the course of the disease.

(3) Enlarged abdomen may be:

- *FI- Fetus:* Rectal examination & pregnancy test.
- *F2- False fetus:* Extrauterine pregnancy
- *F3- Fibroma:* Tumor
- *F4- Fat:* Excessive area of dullness, no other signs.
- *F5- Food:* Impacted rumen with dehydration.
- *F6-Foreign body:* History of ingestion with abdominal pain.

- *P7- Flatus:* Tympanic rumen.
- *F8- Feces:* Constipation, hard feces & colic.
- *F9- Fluid.* Ascities
- (4) Dilated bladder: oliguria, later on uremia
- (5) Ruptured bladder: Empty bladder after severe colic,
- urinferous odor,history of severe colic then sudden
- disappear, abdomen puncture gives urine.
- (6) Ruptured of rumen, abomasum, stomach, intestine:
- ingesta in peritoneum.
- (7) Rupture of uterus: History of dystokia, lochia in peritoneum.

Treatment

(1) Treat the real cause.

(2) Diet rich in protein, poor in water & sodium chloride.

(3) Diuretic as: IM lasix (1 ampule/ 70 kg BW) or Oral 15 gm potassium acetate & 15 gm potassium citrate for cows daily till recovery.

(4) Gradual drainage of transudate (leave about 0.33 of ascetic fluid to avoid shock) every 3-5 days.

(5) Iodides & general tonics.