

Disease of cardiovascular system

Physical examination of CVS

1- Heart sounds and check variable sounds and murmurs.

2- Inspection of mucous membrane.

3- Jugular vein pulsation.

J.V is a good place for detection of venous dilatation

4- Palpation on the heart region.

5- Percussion on region of the heart between 5 - 6 intercostal space in the left side. If many changes in the area of dullness either increase or decrease.

6- Auscultation at the same area of percussion.

7- Capillary refill in gum (normal during 3 second)

Primary function of CVS

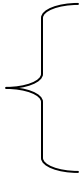
To maintain circulation of blood so that normal exchange of fluid , electrolytes , O_2 , CO_2 and nutrients and excretory substances can be made between vascular system and tissues .

Failure of circulation at any degree interfere with these exchange and basic of circulation failure.

The function system of CVS include:

1- Heart

2- Blood vessel

Circulatory failure  Heart failure
Peripheral failure

Congestive heart failure

The disease on which the heart is not able to maintain the circulation equilibrium at rest and characterized by congestion of the venous circuit and accompanied by dilatation of veins, lung edema, cardiac hypertrophy and tachycardia.

Etiology

- 1- Myocardial disease (myocarditis , myocardial dystrophy, myocardial degeneration).
- 2- Endocardial disease such as endocarditis.
- 3- Pericardial disease (pericarditis , hydropericardium)
- 4- Diseases accompanied by increase of blood flow such as congenital anomalies of heart and valvular disease.
- 5- Other causes such as pneumonia , pneumothorax and pulmonary emphysema.

Pathogenesis

- 1- In the early stage of cardiac disease , the cardiac reserve and compensatory mechanisms of heart may maintain circulatory equilibrium.

2- However cardiac reserve is reduced and animals are not able to cope with circulatory emergencies as well as a normal animals is comparatively normal at rest but is incapable if performing exercise (phase of poor exercise tolerance).

3- When these compensatory mechanisms reach their physiological limit and the heart is unable to cope with circulatory requirement at rest , CHF develops.

Right Sided CHF

Venous congestion is manifest in the capillary bed in the greater circulation. The increase in mean right arterial pressure increases the mean capillary pressure the net forces for filtration of fluid across the capillary bed is therefore greatly increased resulting in the production of edema (Anasarca, hydrothorax, ascitis). Increased hydrostatic pressure of kidney reduce the flow blood and urine output is reduced . Venous congestion of the portal system is due to hepatic congestion and accompanied by impaired digestion and absorption lead to diarrhea.

Left sided CHF

Increased pulmonary venous pressure result on venous congestion, decrease compliance of the lungs and increase in the respiratory rate. Bronchial capillary congestion and edema result in encroachment on air ways and decrease in ventilatory efficiency. Where venous hydrostatic pressure is high the net force for filtration of fluids across the pulmonary capillary bed is greatly increased . This can result in pulmonary edema with

the presence of fluids around the septal vessels and in the alveolar space accompanied by marked impairment of gas exchange .

Clinical finding

Left sided CHF

- 1- Increase of rate and depth of respiration
- 2- Presence of moist rales
- 3- Severe dyspnea and cyanosis
- 4- Increase of heart rate.

Right Sided CHF

1- Increase of heart rate, edema (Anasarca, ascites , hydrothorax and hydropericardium). **Anasarca** is limited to ventral surface of the body (neck and Jew).

2- If the congestion is sufficiently severe liver palpably enlarged protruding pyond the right costal arch.

3- The respiration is deeper than normal and the rate may be slightly increased.

4- Urine flow is usually reduced, urine is concentrate and contain a small amount of albumin.

5- Faeces is usually normal at first but in the late stage diarrhea may be profuse.

6- Body weight may increased because of edema but the appetite is poor and condition is lost rapidly.

7- Dilatation of superficial veins especially Jugular vein with true Jugular pulsation (positive Jugular pulsation).

8- Epistaxis may occur in horses but is rare in other species.

9- The attitude and behavior of the animals is one of listlessness, and depressions.

Clinical pathology

1- Aspiration of fluid from accumulation in any of cavities may be bought necessary in the origin of fluid is in doubt.

2- The fluid is transudate in most cases and protein is present in large amount due to leakage of plasma from damaged capillary walls.

3- Proteinurea is usually present for the same reason.

4- Increase of venous pressure.

Necropsy findings

1- Pulmonary congestion and edema (Left sided).

2- Anasarca , ascites, hydrothorax, hydropericardium, enlargement and engorgement of liver (right sided).

* Sometimes the CHF occurs in both sides (General H.F).

Prognosis

Is varies in certain extent with the causes but in most cases in large animal it is unfavorable

Differential diagnosis

1- Accumulation of fluid in abdomen occurs in peritonitis, bladder rapture and liver fibrosis.

Peritonitis → exudates contain bacteria and protein.

Bladder rapture → no urine, abdominal pain, BUN,
Aspiration of fluid is urine.

Liver fibrosis → other sings of hepatic involvement.

2- Other causes of dyspnea such as disease of respiratory system.

Treatment

A - The primary aim of therapy to eliminate edema by

- 1- Decrease the work of the heart by rest.
- 2- Reduce sodium intake.
- 3- increase sodium elimination.

* **Furasimide** in dogs and cats orally, i/m or i/v 2-5 mg/kg B.W once or twice daily for 2-3 days in horses i/m , i/v 250-500 mg once or twice daily for 2-3 days.

B- Digoxin (Digitalis glycosides) .

- 1 - Oral administration in ruminant have little value.
- 2 - I/V injection must be given carefully because danger of acute toxicity.