Diseases of the musculoskeletal system 632

Diseases of the organs of support,including muscles, bones, and joints, have much importance and the major clinical manifestations of those diseases are lameness, failure of support, insufficiency of movement and deformity.

The major classification of diseases of musculoskeletal system included The degenerative diseases of muscles,bones and joints such as myopathy, osteodystrophy and arthropathy, however, The inflammatory diseases included myositis, osteomyelitis and arthritis.

Principal manifestations of musculoskeletal disease…It include

1-Lameness…

Lameness is an abnormal gait or locomotion characterized by limpingعرج (claudication) or not bearing full weight on a leg, usually associated with pain in the musculoskeletal system.

- Lameness must be differentiated from ataxia, which is an abnormal gait characterized by lack of coordination of muscular action, usually occur because of a lesion of the central or peripheral nervous system.
- and also lameness must be differentiated from weakness which is the inability to maintain a normal posture and gait, usually because of gneralized weakness due to an abnormal systemic state such as shock, hypocalcemia, or starvation.

Factors contribute to lameness include:

a-Injuries due to floor surfaces

b-Persist wet, unhygienic ground conditions

c-Overcrowding and trampling during transportation and handling

d-Nutritional inadequacies

e-Undesirable skeletal conformation

f-Failure to provide regular foot trimming.

2- Abnormal posture and movement…

Abnormal movements include limpness, sagging تدلي or stiffness تصلبand lack of flexion whereas abnormal postures include reduced activity in standing up and persistent recumbency.

3- Deformities العاهات

Atypical disposition الترتيب, shape or size of a part of the musculoskeletal system form a deformity. This may occur in a number of ways, and be caused by the following.

- A-Muscle and tendon defects…such as

1- Congenital hypermobility of joints, inherited and sporadic

2-Congenital flexection or stretched tendons of limbs

3-Muscle hypertrophy

4-asymmetric hindquarters

- B-Joint defects…such as

1- ankylosis

2- Joint enlargement of rickets and chronic arthritis.

- C-Defects of the skeleton…such as

1- Dwarfism and calves with short legs

2- Giant stature القوام

3- Asymmetry such as high withers or low pelvis

4- complete or partial absence of Limbs, curved limbs

5-Bnormality of such as Head such as bulldog calves

4- Spontaneous fractures…

Spontaneous fractures occur uncommonly in farm animals but might occur due to nutritional deficiencies as in case osteodystrophia in horses rickets and/or steomalacia
5- Musculoskeletal pain…..which caused by
caused by
a-lacerations and hematomas of muscle and myositis
b-Osteomyelitis and fractures,
c-arthritis and joint dislocations,
d- sprains of ligaments and tendons
e-Inflammatory lesions of the limbs caused by deep penetrating injury
f- laminitis and septic arthritis
g- Ischemia of muscles and generalized muscle tetany

The economical impact of musculoskeletal diseases…
1-Loss of production occurs because animals that are in pain have difficulty moving around and do not eat and milk normally.
2- Reproductive performance may be reduced because of failure to come into heat normally.
3-Increase culling rate
4-Increase cost of treatment ,time consuming and clinical management becomes very difficult.

Examination of the musculoskeletal system…it include

1- Analysis of gait and conformation which done by Inspection of the gait of the animal to localize the site of lameness or any abnormality .
2- Close physical examination, it applied to indicated the lesion. Which includes passive movements of limbs to identify fractures or dislocations and Muscles can be palpated for evidence of enlargement, pain, or atrophy.
3- Radiography, is useful for the diagnosis of diseases of bones, joints and soft tissue swelling of limbs.
4- Ultrasonography, is used commonly in dogs and horses for the view soft tissue structures of the joints.
5- Muscle biopsy, it useful for microscopic and histochemical evaluations.
6- Arthrocentesis, Joint fluid is collected by needle puncture of the joint cavity and examined for the presence of cells, biochemical changes in the joint fluid and the presence of infectious agents.
7- Arthroscopy, Special endoscopes are available for inspection of the joint cavity and articular surfaces .
8- Serum biochemistry and enzymology
9- Nutritional history,which include analysis of the feed and determination of the total amount of intake
10- Environment and housing, when outreaks of lameness occur in housed animals the quality of the floor must be examined to evaluate the possibility of floor injuries.

Diseases of muscles….

Myasthenia (skeletal muscle asthenia)

It occur due to
1-Ischemia as occur in iliac thrombosis in the horse and after recumbency in cows with parturient paresis.
2- Metabolic effect on muscle fibers as in hypokalemia,hypocalcemia and possibly hypophosphatemia ,hypomagnesemia and hypoglycemia

3- Toxins as in general toxemia

Myopathy

The term myopathy describes the non inflammatory degeneration of skeletal muscle that is characterized clinically by muscle weakness and pathologically by hyaline degeneration of the muscle fibers, The serum levels of some muscle enzymes are elevated and myoglobinuria is a common sing.

Etiology….

1- Nutritional deficiencies of vitamin E and selenium

2- The effects of un usual exercise(exercise-associated muscle disorder)

As in horses affected with tying-up syndrome, azoturia,or sheep chased المطارده by dogs, or ruining cattle during capture.

3- Degenerative myopathy, This occurs in newborn calves, sheep and goats affected by Akabane virus infected in utero.

3- Inherited and congenital myopathies.

4- Toxic agents caused by toxic plants

5- Ischemia as Ischemic myonecrosis occurs in the thigh muscles of cattle recumbent for about 48 hours or more .

6- Neurogenic as Neurogenic muscular atrophy occurs sporadically due to traumatic injury and degeneration of the nerve supply to skeletal muscle.

7- Neoplasms

Pathogenesis…

1- The characteristic change in most cases of primary myopathy varies from hyaline degeneration to coagulative necrosis

2- Because of the necrosis of muscle,myoglobin is excreted in the urine and myoglobinuric nephrosis is an important complication resulting in dark brown urine

3-Elevation of muscle enzymes

4-In tying up syndrome and azoturia there is increase glycolysis with depletion of muscle glycogen.

Clinical findings…

1-In general there is a sudden onset of weakness and pseudoparalysis of the affected muscles, causing paresis and recumbency and, in many cases, accompanying respiratory and circulatory insufficiency.The affected animals will usually remain bright and alert but may appear to be in pain.

2- The temperature is usually normal but may be elevated in severe cases.

3- Cardiac irregularity and tachycardia may be evident.

4- myoglobinuria occurs in adult horses and yearling cattle.

5- The affected skeletal muscles in acute cases may feel swollen,hard and rubbery مطاطي

Treatment…

1-Removal and treatment of the primary cause

2- Supportive therapy as in cases or prolong recumbency which include

- Provide thick bedding
- Removal from solid floors to softer ground
- Frequent turning from side to side
- Fluid therapy to prevent myoglobinuric nephrosis
- provide palatable diet.

Myositis

Myositis may arise from direct or indirect trauma to muscle and occurs as part of asyndrome in a number of specific diseases including blackleg, foot-and –mouth disease, bluetongue, ephemeral fever,swine influenza, and others such as ingection .it mostly characterized by severe lameness, swelling, heat and pain on palpation. Accompanied by toxemia and fever.

Diseases of bones…

Osteodystrophy…

Osteodystrophy is are those diseases of bones in which there is a failure of normal bone development, or abnormal metabolism of bone that is already mature. The major clinical manifestations include distortion and enlargement of the bones, susceptibility to fractures and interference with gait and posture.

Etiology**…**

1-Nutritional causes….which include

a-Absolute deficiencies of Calcium, phosphorus and vitamin D as in cases of

- Rickets in young animals
- Osteodystrophia fibrosa in the horse

b-Copper deficiency…as in cases of

- Osteoporosis in lambs

c-Hypovitaminosis A

2--Chronic parasitism

3-chemical agents such as lead poisoning

4- Congenital anomalies

Clinical findings….

1-there is weakening of the bones due to defective mineralization and osteoporosis, which results in the bending انحناء of bones, which probably causes pain and shifting lameness .

2-The normal weight and tension stresses cause distortion of the normal axial relationships of the bones, which results in the bowing of long bones.

3-The distortions occur most commonly in young, growing animals. The distal ends of the long bones are commonly enlarged at the level of the epiphyseal plate and circumscribed swellings of the soft tissue around the epiphyses may be prominent, and painful on palpation.

4- Spontaneous fractures occur commonly and usually in mature animals.Common sites for fractures include the long bones of the limbs, pelvic girdle الزنار الحوضي, femoral head, vertebrae, ribs, and transverse processes of the vertebrae.

Clinical pathology…

The laboratory analyses that are indicated include:

1- serum calcium and phosphorus Serum alkaline phosphatase ,

2-Feed analysis for calcium,phosphorus, vitamin D and other minerals when indicated such as copper,

3-Histopathology of bone biopsy

4- Radiographic examination of the skeleton

Treatment…

Oral and parentral administration of Ca.phsphprus and Vit.D

Osteomyelitis

Inflammation of bone can occur when when infection is introduced by traumatic injury or by the hematogenous route. Bacteria can reach bone by any of three routes:

- Hematogenousl route
- By extension from an adjacent focus of infection
- By direct inoculation through trauma or surgery

The disease can be associated with actinomycosis of cattle ,brucellosis, atrophic rhinitis ,necrotic rhinitis. Nonspecific, hematogenous infection with other bacteria occurs sporadically and is often associated with omphalitis, abscesses or infection of castration or docking wounds .

Clinical findings…

- The common clinical findings of osteomyelitis include:
- Lameness
- Generalized soft tissue swelling and inflammation
- Pain on palpation of the affected area
- Chronic persistent drainage
- Secondary muscle atrophy of the affected limb
- Osteomyelitis affecting the cervical vertebrae, usually the fourth to sixth vertebra, causing a typical syndrome of abnormal posture

Treatment…

- Remove the primary cause
- In cases of long-term infection or those with extensive bone necrosis, surgery is generally recommended to remove sequestra,devitalized tissue and sinus tracts
- Antimicrobial therapy