

Introduction

The naval ill or joint ill is most commonly seen in the newborn buffalo calves and typically occurs within the first few weeks of life. It is a bacterial infection that typically affects the neonatal buffaloes soon after birth. The infection commonly affects the navel (umbilical area); however, this can be extended to the joints, bones and other organs leads to sepsis. This condition results in poor growth, reduced vitality and in severe cases, death. The disease is caused by bacterial infections that enter the body through the umbilical cord or damaged skin and spread to other parts of the body. This disease is of particularly common in buffalo farming especially in tropical/sub-tropical regions where the environmental conditions and managemental practices predispose the animals to infections.

Causes

The primary cause of naval ill is bacterial infection. The bacteria are

- *E. coli* (*Escherichia coli*)
- *Streptococcus* spp.
- *Staphylococcus aureus*
- *Salmonella* spp.
- *Trueperella pyogenes* (formerly *Arcanobacterium pyogenes*)
- *Clostridium* spp.

These bacteria are commonly found in the environment especially in the unsanitary conditions or on contaminated surfaces. The infection also results from the improper handling during birth which leads to contamination of the navel or joints. Other contributing factors such as

- Poor hygiene during calving such as unclean bedding, equipment and poor sanitation practices.
- Delayed navel disinfection or improper care of the umbilical cord after birth.

- Inadequate colostrum intake by the newborn which reduces the immunity.
- Excessive humidity or rainfall in tropical/sub-tropical climates which create the moist environments that support the bacterial growth.
- Overcrowding in pens or improper housing conditions leads to poor ventilation and hygiene.

Incidence

The naval ill/joint ill is more common in regions with poor managemental practices and unsanitary conditions. In tropical areas where the high humidity and warmth provide the favourable conditions for the bacterial growth and the incidence is increased during the rainy season.

Factors that affect the naval ill/joint ill

- Hygiene: Poor hygiene around the calving and in housing areas increases the likelihood of bacterial infections.
- Navel Care: Buffalo calves born in conditions where the navel is not disinfected or treated promptly are at greater risk.
- Immunity: Calves that do not receive adequate colostrum are more susceptible to infections.
- Management: Farms with high stocking density, inadequate bedding or poor ventilation are more prone to outbreaks.

Pathophysiology

The naval ill begins when bacteria enter the umbilical cord during or shortly after birth. These pathogens then spread to surrounding tissues such as the joints, bones and blood leads to

- Bacterial invasion: The infection starts at the navel (umbilical cord); however,

the bacteria also infect the joints, bones or even the lungs.

- Sepsis development: If left untreated, the infection leads to systemic infection (sepsis) which in turn involves multiple organ systems particularly the lungs, liver and kidneys.
- Joint involvement: In cases of joint ill, bacteria invade the synovial fluid leads to inflammation and pus formation within the affected joints. This leads to joint enlargement, lameness and pain.
- Abscess formation: The infection also causes the formation of abscesses which further complicates the condition.

Clinical symptoms

The clinical signs of naval ill and joint ill vary with depends upon the severity of the infection and involvement of other body systems. Typical symptoms are

- Naval Ill (umbilical infection): Redness, swelling and discharge at the umbilical cord or navel area. Thick and purulent discharge from the umbilical area which is foul-smelled. Fever and loss of appetite in some cases. Swollen abdomen in severe cases due to severe spread of infection. Abscesses develops around the umbilicus.
- Joint Ill (infection of joints): Swelling and pain in one or more joints (elbow, knee, hock). Lameness and difficulty moving or walking. Fever and complete depression, hot, swollen, and painful joints with severe enlargement. Reduced mobility, stiffness or lameness in the affected limb. In severe cases, the pus or fluid is accumulated in the joints.
- Systemic symptoms in severe cases of sepsis: High fever, dehydration and weakness are observed. Rapid breathing with signs of respiratory distress are also observed. Tachycardia (higher heart rate) is also noted. Poor growth and weight gain. Death in severe untreated cases.

Diagnosis

The diagnosis of naval ill or joint ill is based on the clinical examination and laboratory tests.

- Clinical examination: Careful and proper inspection of the umbilical site, joints and general health of the buffalo calf. Similarly, the signs of swelling, discharge or abscesses are the suggestive symptoms of infection.
- Bacterial culture: A simple pus or discharge sample from the umbilicus swelling or joint fluid are to be taken and cultured to identify the causative bacteria. This helps to choose the appropriate treatment.
- Blood tests: A complete blood count (CBC) exhibits the elevated level of white blood cells (WBCs) suggests that there is severe infection or inflammation.
- Joint fluid analysis: The fluid from the affected joint is aspirated and analyzed for signs of infection such as pus or high white blood cell count.

Treatment

Treatment depends on the severity of the infection.

- Antibiotics: Broad-spectrum antibiotics such as penicillin or cephalosporins are commonly used to treat the bacterial infections. The treatment needs to be adjusted according to the results of bacterial culture and sensitivity tests. The systemic antibiotics through oral or injection are used for the generalized infection. The topical antibiotics or intramammary agents are used for the localized infection in the navel area.
- Anti-inflammatory drugs: NSAIDs such as flunixin meglumine or ketoprofen are used to reduce the pain and inflammatory condition.
- Drainage of abscesses: In severe cases of joint or umbilical abscess, the surgical drainage or aspiration is required to remove the pus and promote for healing.

- Supportive Care: The calf should be proper nutrition, hydration and comfortable housing management to support the recovery.
- Fluid Therapy: In severely dehydrated animals, the intravenous fluid therapy is recommended.

Control and prevention

Prevention of the naval ill and joint ill is done with good animal husbandry practices, hygiene and proper neonatal care.

- Navel disinfection: The umbilical cord needs to be disinfected immediately with use of a strong antiseptic solution such as iodine solution after birth to prevent the bacterial entry.
- Clean the calving areas: The calving area should be clean, dry and free from contaminants. Proper bedding and sanitation help to minimize the exposure to the bacteria.
- Proper calf care: Adequate colostrum should be provided to the calf to ensure it has got sufficient colostrum and immunity. The colostrum is essential to the neonates for their strong immune system.
- Culling: The severe or chronic joint ill affected animals need to be culled to prevent the spread of infection.
- Vaccination: Although there are no specific vaccines for the naval or joint ill; however, good general health and proper management reduce the risk of infection.
- Minimize stress: Reduce the overcrowding, improve ventilation and ensure the adequate housing conditions to minimize stress which are the conditions lower the immune response.
- Prompt veterinary care: Early detection and treatment of symptoms reduce the severity of the disease and prevent complications.

Conclusion

The naval ill and joint ill are significant health concerns in the newborn buffaloes in tropical/sub-tropical regions where the environmental conditions and managerial practices predispose the

calves to infection. Early diagnosis and effective treatment with antibiotics along with preventive measures such as proper hygiene and navel disinfection significantly reduce the incidence of this condition. The good managerial practices and proper care reduce the risk of naval and joint ill which in turn promote the health and productivity in the buffalo herds.

