

**Malignant catarrhal fever ( MCF )**  
**( Bovine malignant catarrh , malignant head catarrh )**

**Definition :**

Malignant catarrhal fever (MCF) is a generalized viral disease of domestic cattle and buffaloes and many species of wild ruminants characterized by high fever, profuse nasal discharge, corneal opacity, ophthalmia, generalized lymphadenopathy, leukopenia, and severe inflammation of the conjunctival, oral, and nasal mucosa with necrosis in the oral and nasal cavities sometimes extending into the esophagus and trachea. Occasionally central nervous system (CNS) signs, diarrhea, skin lesions, and nonsuppurative arthritis are observed.

**Etiology :**

The etiologic agent is a herpes virus with a capsid about 100 nm and envelop about 140 – 220 nm in size . MCF is really two diseases clinically and pathologically indistinguishable caused by two different infectious agents :

- Alcelaphine herpesvirus – 1 ( AVH 1 ) in the genus Rhadinovirus , subfamily Gamaherpsvirinae . This is a wildebeest associated MCF virus transmitted from blue wildebeest.
- A virus designated Ovine herpesvirus 2 . This is the sheep associated MCF virus transmitted from sheep .

## **Epidemiology :**

- ◆ Wildebeest associated MCF occurs in most African countries in cattle which is commingle with clinically normal wildebeest and hartebeest .
- ◆ Sheep associated MCF occurs in low incidence of cattle and occurs in outbreak form or sporadically in cattle running as sole cattle herds.
- ◆ Goats can also act as source of infection for cattle .
- ◆ The disease with both agents is almost fatal .
- ◆ The mortality rates is varies . In most instances there is isolated cases but up to 50 % of herd may be affected in rare outbreaks which may be short lived or last for several months .
- ◆ Wildebeest associated MCF is probably spread by inhalation of aerosols or ingestion of pasture contaminated by virus excreted by young wildebeest in the nasal and ocular discharges , spread by direct contact between the cattle does not seem to occur.
- ◆ Sheep associated MCF is spread by unknown means .

## **Pathogenesis :**

MCF is fatal multisystemic disease characterized by lymphoid hyperplasia and widespread vascular epithelial and mesothelial lesions which are morphologically associated with lymphoid cells .Involvement of the vascular adventitia account for the development of gross lesions include the epithelial erosions and keratoconjunctivitis . The lymph nodes enlargement is due to atypical proliferation of sinusoidal cells and cerebromeningeal changes usually referred to as encephalitis are in fact a form of vasculitis .

### **Clinical findings :**

The incubation period in natural infection varies from 3 – 8 weeks and after artificial infection average 22 days ( 14 – 37 days ) . MCF occur in several forms .

- **Peracute form** . There is severe inflammation of the oral and nasal mucosa and haemorrhagic gastroenteritis are observed . The course of this form is 1 – 3 days . There is usually high fever , dyspnea and severe diarrhea .
- **Intestinal form** : This form is characterized by pyrexia , diarrhea and severe hyperemia of the oral and nasal mucosa . Nasal and ocular discharge as well as enlargement of lymph nodes are common feature. The course of this form is 4 – 9 days .
- **Head and eye form** : This is the typical clinical syndrome of MCF . The first evidence of infection is pyrexia which is often heralded 2 – 7 days later by nasal and ocular discharges . Bilateral nasal discharge begins as serous and soon become mucoid , mucopurulent and later purulent . Encrustation is common in late stage and cause partial or complete blockage of nostrils resulting in dyspnea . At this stage , the sick animal breath through the mouth and usually show drooling saliva .

The oral mucosa exhibits intense hyperemia and diffuse superficial necrosis . Because the basal layer of the epithelium is rarely involved the necrotic lesions are designated as erosions rather than ulcers . In the live animals , these lesions have a pink or red color due to exposure to the underlying capillary beds . They are found in the lips , gums , hard and soft palate and the mucosa of the cheeks . The sharp pointed buccal papillae are often involved and the lips slough leaving characteristic reddened blunted papillae . Petechia are

occasionally present . These changes cause severe pain . Increased thirst in early stage of the disease and continues until shortly before death . Anorexia is observed in the late stage of MCF . Constipation is common feature in this form but terminal diarrhea is occasionally observed .

Changes in the eyes include lacrimation that become purulent in the late stage . Ophthalmia , prominent scleral veins and swollen eyelids are common feature .

Corneal opacity Start at periphery and progress toward the centre resulting in either partial or complete blindness . Corneal opacity is usually bilateral but occasionally one eye is effected more severely than other .

Photophobia is usually associated with corneal opacity . An animal exhibiting this sign closes its eyes most of the time and point its head away from the source of light .

Nervous signs are rare although shivering , incoordination and terminal nystagmus may be observed . Skin lesions are rare .

Pyrexia is a common signs of the disease and often biphasic . The temperature is usually high ( 104 – 107 F° ) and remain high until shortly before death at which time it is subnormal . The course of this form is usually 7 – 14 days .

- **Mild form** : This is syndrome caused by experimental infection of cattle using modified virus . They are followed by recovery .

**Necropsy findings :**

Lesions in the mouth , nasal cavities and pharynx vary from minor degrees of haemorrhage and erythema through extensive severe inflammation to discrete erosions . These may be shallow or deep and covered by cheesy diphtheritic deposits . The mucosa of forestomachs may exhibit erythema or haemorrhages or erosions and the same lesions may be found in abomasum . Catarrhal enteritis of moderate degree and swelling and ulceration of the Payers patches are constant . Similar lesions to those in the mouth and nasal cavities are present in the trachea and sometime bronchi but the lungs are not usually involved . Longitudinal shallow erosions are present in the esophagus . The liver is swollen and severe haemorrhage may be visible in the urinary bladder . All lymph nodes are swollen , edematous and often haemorrhage . Characteristic lesions may appear in the kidney . They are not always seen but are typical when present . They are usually small ( 2 – 4 mm ) foci of non suppurative interstitial nephritis . These foci form slight rounded projections from the capsular surface . They are whitish and represent infiltration of mononuclear cells .

**Diagnosis :**

- ◆ A history of disease indicating close contact with wildebeest or sheep .
- ◆ Typical clinical features help in diagnosis .
- ◆ Viral isolation from buffy coat or cell suspension from infected tissues and inoculated into bovine thyroid culture which are check for typical CPE .

**Differential diagnosis :**

- ◆ Bluetongue : Laminae common in bluetongue is absent in MCF ; ophthalmia and corneal opacity associated with MCF are rare in bluetongue .
- ◆ BVD – MD : This disease occurs sporadically , severe hyperemia and ophthalmia are not observed in BVD – MD ; diarrhea is rare in MCF , also there is differences in the type of oral lesions between two diseases .
- ◆ Rinderpest : High morbidity and mortality rates .
- ◆ vesicular diseases ( FMD and vesicular stomatitis ) .

**Treatment :**

- ◆ No specific treatment .
- ◆ Non – steroidal anti – inflammatory drugs may ease discomfort .

**Control :**

- Isolation of infected animals and separation of sheep from cattle .
- Attempts to immunize cattle with live or inactivated culture vaccines do not provide protection against experimental challenge .