

FMD in Wild Herbivorous

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Synonym- Aphthous fever, Aftosa, Enzootic apthiae and Hoof-and-mouth disease

INTRODUCTION

The disease is characterized by high fever that declines rapidly after two to three days, blisters inside the mouth that lead to excessive secretion of stringy or foamy saliva and to drooling, and blisters on the feet that may rupture and cause lameness. Foot-and-mouth disease (FMD) is an infectious and sometimes fatal viral disease that affects **cloven-hoofed animals**, including domestic and wild bovids.

- The **incubation period** for FMD virus has a range between one and **12 days**.
- Susceptible host are **cervid and bovids**.

Aetiology

- Picorna virus group
- Genus-aphthous virus
- Serotypes – O, A, C, and South African type SAT-1, SAT-2, SAT -3 and Asia 1 of which O, A, C and Asia 1 - prevalent in India

Transmission of the Virus

Aerosol (respiratory) route unlikely to occur beyond 100 meters species by direct contact with infected animals. Infection can also occur through abrasions on skin or mucous membranes in contact with contaminated food.

Morbidity and Mortality

- ▶ The mortality rate is generally less than 1% in adult animals, but it can be much higher in young animals.
- ▶ Among wildlife, impala seem to be highly susceptible to the disease.
- ▶ A case fatality rate of at least 50% was reported in mountain gazelles

Epidemiology

- ▶ Free living gaur (*Bos gaurus*) at manikgarh in Hyderabad state 15 to 20 cause death. Infection spread from cattle penned in forest owing to lack of grazing down below.
- ▶ Zoological Park, Hyderabad 1971-72 type C virus cause death of 3 out of 8 bison's, American bison's (*Bison bison*) affected more severely than Indian bison and infected feed are source of infection.
- ▶ Nilgai (Paikne *et al.*,1976), Hog-deer (Singh,1988) and Sambar and chital deer (kar *et al.*,1983).

PATHOGENESIS

- ▶ It is normally present in oral cavity, usually occurs by inhalation and the initial site of virus replication is thought to be the respiratory bronchioles of the lung. however, an earlier study showed initial replication of the virus occurred in the mucosa and possibly the lymphoid tissues



of the pharynx, particularly in the tonsillar region of the soft palate. The virus then spreads via the bloodstream to **langerhans cells** in epithelia, and all epithelial cells in contact with an infected langerhans cell become infected. In infected animals FMD v is disseminated to many epidermal sites, but lesions only develop in areas subjected to mechanical trauma or physical stress.

CLINICAL SIGNS

- ▶ Affected animals develop fever, show reluctance to walk and may separate itself from the rest of the flock.
- ▶ Vesicles may develop in the interdigital cleft, on the heel bulbs and on the coronary band, but they usually rupture rapidly and their appearance may be hidden by the co-existing presence of foot rot.
- ▶ High body temperature
- ▶ Vesicles on tongue, feet, teat, rumen pillars and sudden death of calves
- ▶ Vesicles appear on mouth
- ▶ Rupture leaving ulcer - refuses feed and water
- ▶ Also seen in lightly haired parts (Udder and teat)
- ▶ Produces smacking noise or smacking of tongue
- ▶ Drooling of saliva
- ▶ Adult animals may suffer weight loss from which they do not recover for several months, as well as swelling in the testicles of mature males, and cows' milk production can decline significantly.
- ▶ Though most animals eventually recover from FMD, the disease can lead to myocarditis (inflammation of the heart muscle) and death, especially in newborn animals.
- ▶ Vesicles may also be observed on the teats and rarely on the vulva and prepuce.
- ▶ Compromised epithelium can predispose to other secondary infection and complicate the situation.
- ▶ Young animals may die due to heart failure.
- ▶ Lesions also seen – Rumen, reticulum and omasum
- ▶ Hemorrhage and diffuse oedema in mucosa of abomasum and small intestine
- ▶ Death may be due to gastroenteritis and myocardial lesions in young calves - "**Tigroidheart**".

Microscopic lesions

- ▶ Vacuoles appear in the cells of **epithelium with eosinophilic cytoplasm and pyknotic nuclei**. These small vesicles coalesce to form larger ones and the epithelium gets detached. Hyaline degeneration and necrosis of myocardial fibres and also in skeletal muscles - "**Tigroid heart appearance**".Secondary bacterial infections produces osteomyelitis and suppurative arthritis

DIAGNOSIS

- ▶ Material and method collected for diagnosis
- ▶ Tongue epithelium and vesicular fluid and paired sera
- ▶ Clinical signs and lesions
- ▶ Complement fixation test
- ▶ Virus isolation and polymerase chain reaction

Prevention and control

- ▶ FMD polyvalent vaccine @4ml S/c or I/M per deer and bovid species has been used.
- ▶ Hygiene measures needs spray of 4% sodium carbonate in 1% KMNO₄ solution daily till the disease subsides.
- ▶ Palliative and supportive therapy (such vitamin C, long-acting antibiotic) to the affected animal will facilities early recovery and reduced the mortality
- ▶ Susceptible livestock and wild ruminets e.g. movement restrictions, disinfection and vaccination.
- ▶ In countries Endemic to FMD, ruminants may be included in regular vaccination campaigns.
- ▶ Disinfection of affected premises, equipment and vehicles. Effective disinfectants include sodium hydroxide (2%), sodium carbonate (4%), citric acid (0.2%).
- ▶ Good biosecurity measures should be practiced on uninfected Zoo to prevent entry of the virus.

Transmission of FMDV from wildlife can be controlled by separating wildlife from domesticated livestock with fences, and by vaccination of livestock. Cattle in localities adjacent to wildlife areas should be vaccinated bi-annually against FMD. This approach is required in preventing transmission of FMD from livestock to wildlife.

