

AN EPIDEMIOLOGICAL STUDY ON FOOT AND MOUTH DISEASE OUTBREAK IN CATTLE OF ERODE DISTRICT OF TAMILNADU

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ABSTRACT

Foot and Mouth Disease (FMD) is one of the most important viral diseases of livestock especially cattle causing heavy economic losses to farmers. FMD outbreak in cattle during the period from 2002 to 2008 in Erode District of Tamil Nadu is reported. The incidence of FMD in cattle and buffaloes, season, morbidity and mortality were investigated. The results revealed that the disease generally occurred from August to February of the calendar year with very high prevalence from November to February. The disease caused an average mortality of 16.1 per cent in cattle, with highest mortality rate of 32.6 per cent during 2003-04, followed by 16 per cent mortality in 2007-08, 4.2 per cent in 2002-03 and a lowest mortality rate of 2.5 per cent during 2004-05. In 2007-08, a total of 2352 cattle and buffalo were affected with a mortality of 16 per cent among morbid animals. The disease affected 1578 cows, 349 calves, 349 buffaloes and 76 buffalo calves with a mortality percentage of 14.3, 29.8, 10.6 and 13.2 respectively. The disease caused 17.1 per cent mortality in white cattle and 11.1 per cent mortality in buffaloes. Among morbid animals, the mortality in adults (cow and buffalo) and young ones (calves and buffalo calves) were 13.7 per cent and 26.8 per cent, respectively. Higher morbidity and mortality were observed in areas irrigated with Lower Bhavani Project (LBP) Channel and Cauvery river water irrigation than dry land area of the district.

Key words: Foot and Mouth Disease, cattle, epidemiology

INTRODUCTION

Foot and Mouth Disease (FMD) is the most contagious viral disease with the potential of causing great economic losses in cloven-footed animals (O.I.E., 2000). The disease is

characterized by vesicular lesions in the buccal cavity and feet. Erode district of Tamil Nadu, well known for milk production is highly populated with crossbred, native cattle and buffaloes. Erode district ranks first in total livestock population in the State (17th

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Quienquennial livestock census, 2004 issued by Director of Animal Husbandry and Veterinary Services, Tamil Nadu) and outbreak of any disease causes severe economic loss to the farmers of the district. Information on the season of the disease occurrence, area most affected by the disease, species (white cattle or buffalo) and age of animals affected by FMD based on previous outbreaks are highly essential for disease forecasting to enable effective prevention programmes for FMD in the district and areas similar to the district. Hence, an investigation was carried out to study the epidemiological pattern of FMD occurrence in Erode district of Tamil Nadu.

MATERIALS AND METHODS

A study was undertaken on FMD occurrence in cattle and buffalo for the period from April 2002 to March 2008 of Erode district of TamilNadu. FMD occurrence among cattle and buffalo was investigated. The morbid animals were examined and the clinical manifestations were recorded. Tongue epithelium from ailing animals and the heart tissue were collected on post mortem examination of dead animals. The samples in virus transport medium were sent to Indian Veterinary Research Institute, U.P for serotyping of the virus.

RESULTS AND DISCUSSION

The number of animals affected and percentage of mortality among morbid animals due to FMD during April 2002 to March 2008 in Erode district of Tamil Nadu is given in Table 1. The results revealed that a total of 2462 cattle and buffaloes were affected between 2002 and 2008 with mortality in 394 animals. The disease

caused an average mortality of 16.0 per cent in cattle, with highest mortality rate of 32.6 per cent in 2003-04, followed by 16 per cent in 2007-08, 4.2 per cent in 2002-03 and a lowest mortality rate of 2.5 per cent during 2004-05.

During the period under report, the disease caused severe morbidity and mortality in 2007-08 (Table 2). In this period, a total of 2352 cattle and buffaloes were affected with mortality of 16 per cent. The disease affected 1578 cows, 349 calves, 349 buffaloes and 76 buffalo calves with a mortality percentage of 14.3, 29.8, 10.6 and 13.2 respectively. The disease caused 17.1 per cent mortality in white cattle and 11.1 per cent mortality in buffaloes and it was observed that the crossbred cattle were highly prone to FMD compared to buffaloes. Similar findings were reported by Gopala Krishna Murthy and Ramaswami (1999), Chandranaik *et al.* (2007) and Jai Sunder *et al.* (2008). The disease caused 13.7 per cent mortality in adults (cow and buffalo) and 26.8 per cent mortality in young ones (calves and buffalo calves) and it was observed that the mortality was found to be high in crossbred calves than buffalo calves. Higher mortality in calves due to FMD was also reported by Jai Sunder *et al.* (2008) in Andaman and Nicobar island during an FMD outbreak in the year 2004-05. Severe FMD outbreak like the 2007-08 outbreak was reported during the year 1999 in Erode district by Gopala Krishna Murthy and Ramaswami (1999). The biological samples examined for serotyping revealed that the virus as Type 'O' during 2007-08 outbreak. It was noticed that the serotype 'O' contributes for almost 80% of the outbreaks followed by Asia 1 serotype, which contributes 18% in our country (Chandranaik *et al.*, 2007). JaiSunder *et al.* (2008) confirmed type 'O' FMD virus in

Andaman and Nicobar Island during the FMD outbreak in the year 2004-05. However, Chandranaik *et al.* (2007) could isolate Asia 1 type virus during FMD outbreak in Karnataka.

The month-wise occurrence of the disease is given in Table 3. The results revealed that the disease occurred generally from August to February of the calendar year with highest number of animals affected during October followed by November, January, December, August and February in descending order. In other months including September, no animals were found affected by FMD in Erode district. The percentage of mortality was highest during December followed by February, October, November, August, January and was 41.4, 25, 19.2, 10.1, 4.4 and 4 percent respectively with an average mortality of 16 per cent.

The area-wise occurrence of morbidity and mortality in the district due to FMD is given in Table 4. The result revealed that the mortality was higher in areas of the district where Lower Bhavani Project (LBP) channel and Cauvery river water is irrigating followed by dry land area than wet land area without channel or river irrigation. The higher morbidity and mortality in area with channel and/ or river irrigation was

also reported by Gopala Krishna Murthy and Ramaswami (1999).

In Erode district, public has been conducting a large cattle market every year during August in Anthiyur during a temple festival, in which large number of crossbred cattle as well as native cattle such as Burgur are traded. The crossbred cattle had been coming from plain land area and the native cattle from hill region of Sathyamangalam and Thimbam and were mostly unvaccinated. The mixing of crossbred cattle with unvaccinated native cattle in the market might have caused initial spread of the virus to unvaccinated crossbred cattle. Further spread of the disease might be possibly due to the movement of animals from the market to all parts of the district. The spread might be further favoured by the channel and river water irrigation as evidenced by the highest morbidity and mortality in these area and also by less environmental temperature with more humidity during November, December, January as evidenced by highest morbidity during the months of October, November, December and January. Humidity of the environment was reported to be the important factor for the spread of the virus (Blood *et al.*, 1979).

Table 1:
Year-wise occurrence of morbidity and mortality due to FMD in Erode district of Tamil Nadu during 2002-08

| Year | No of animals affected | No of animals died | Mortality percentage (among morbid) |
|-------------|-------------------------------|---------------------------|--|
| 2002-03 | 24 | 01 | 4.2 |
| 2003-04 | 46 | 15 | 32.6 |
| 2004-05 | 40 | 01 | 2.5 |
| 2005-06 | - | - | - |
| 2006-07 | - | - | - |
| 2007-08 | 2352 | 377 | 16.0 |
| Total | 2462 | 394 | 16.0 |

Table 2:
Morbidity and mortality due to FMD in Erode district of Tamil Nadu during 2007-08

| Animals | No of animals affected | No of animals died | Mortality percentage (among morbid) |
|----------------|-------------------------------|---------------------------|--|
| Cow | 1578 | 226 | 14.3 |
| Calves | 349 | 104 | 29.8 |
| Buffalo | 349 | 37 | 10.6 |
| Buffalo calves | 76 | 10 | 13.2 |
| Total | 2352 | 377 | 16.0 |

Table 3:
Month-wise occurrence of morbidity and mortality due to FMD in Erode district of Tamil Nadu during 2002-08

| Month | No of animals affected | No of animals died | Mortality percentage (among morbid) |
|-----------|------------------------|--------------------|-------------------------------------|
| August | 23 | 01 | 4.4 |
| September | - | - | - |
| October | 1531 | 294 | 19.2 |
| November | 821 | 83 | 10.1 |
| December | 29 | 12 | 41.4 |
| January | 50 | 02 | 4.0 |
| February | 08 | 02 | 25 |
| Total | 2462 | 394 | 16.0 |

Table 4: Area - wise occurrence of Morbidity and mortality due to FMD in Erode district of Tamil Nadu during 2007-08

| Geographical Area | No of animals affected | No of animals died | Mortality percentage (among morbid) |
|---|------------------------|--------------------|-------------------------------------|
| Wet land area with Channel and river irrigation | 1553 | 308 | 19.8 |
| Dry land area | 302 | 45 | 14.9 |
| Wet land without channel water irrigation | 607 | 41 | 6.8 |
| Total | 2462 | 394 | 16.0 |

REFERENCES

- Blood, D. C., Henderson, J. A., Radostits, O. M. (1979). *Veterinary Medicine* 5th edn, pp.614 – 620. The English Language Book Society and Bailliere Tindall, London.
- Chandranaik, B. M., Girish, V. R., Harish, B. R., Ravindra Hegde, Mamatha, G. S., Renukaprasad, C. and Krishnappa, G. (2007). Isolation of Asia – 1 FMD virus from an outbreak in Karnataka. *Indian Veterinary Journal*, **84**: 434 – 435.
- Gopala Krishna Murthy, T. R. and Ramaswami, A. M. (1999). Studies on outbreak of Foot and Mouth Disease in Erode district. In proceedings of fourth annual convention and national symposium on current concepts on Diseases of animals and bird – An approach for the new millennium held on 17- 19 December, 1999 at Bangalore, Karnataka.
- Jai Sunder, Rai, R. B., Jeyakumar, S. and Kundu, A. (2008). Outbreak of FMD in cattle of Andaman and Nicobar islands. *Indian Veterinary Journal*, **85**: 329–330.
- O.I.E., 2000. *Manual for diagnostic procedures for terrestrial animal disease*. Chapter 2.1.1., pp. 77-91.