Shobuj Bangladesh Publications House
International Journal of Natural and Social Sciences
ISSN: 2313-4461

Occurrence of foot and mouth disease in cattle in Magura district of Bangladesh

Md. Mostafijur Rahman[1]*, M.A. Jalil[2], K.M. Mozaffor Hossain[3], Khondoker Jahengir Alam[4], Resalatus Salam[5], Md. Ahsanur Reza[6]

[1]Faculty of Animal Science and Veterinary Medicine, Patuakhali Science and Technology University, Babugonj, Barisal-8210, Bangladesh
[2]Veterinary surgeon, District Veterinary Hospital, Dinajpur-5200, Bangladesh
[3]Department of Animal Husbandry and Veterinary Science, University of Rajshahi, Rajshahi-6205, Bangladesh
[4]Department of Pathology and Parasitology, Patuakhali Science and Technology University, Babugonj, Barisal-8210, Bangladesh
[5]DMRF Dental Laboratory, Mirpur -1, Dhaka -1216, Bangladesh
[6]Department of Physiology, Biochemistry and Pharmacology, Patuakhali Science and Technology University, Babugonj, Barisal-8210, Bangladesh

ABSTRACT

The occurrence of foot and mouth disease (FMD) in cattle of Magura district, Bangladesh was studied. The study was performed at the Upazila Veterinary Hospital, Magura sadar, Magura, Bangladesh, during the period from July 2012 to June 2013. A total of 221 suspected cases were examined among them 83 case were FMD. The prevalence of FMD was 37.56%. The adult cattle (46.98%) were more susceptible compared to young (18.07%) and old (34.94%). There was significant seasonal variation in the occurrence of FMD ($P<0.05$) in the study area. The occurrence of FMD was higher in November (27.71). The male cattle (59.04%) were more susceptible than female cattle (40.96%). The higher prevalence (63.86%) of FMD was observed in indigenous breeds than crossed breed of cattle. The study demonstrated the high prevalence (37.56%) of FMD in cattle of Magura district which is highly advisable to take appropriate measure to control FMD in animal and human.

Key words: Foot and mouth disease, prevalence, occurrence, age, sex, breed, season.

*Corresponding author.
E-mail address: rana88dvm@gmail.com (MM Rahman)

INTRODUCTION

Foot and mouth disease (FMD) caused by foot and mouth disease virus (FMDV), is one of the most important disease and biggest trade barrier for animals and animal products (Rufael et al., 2008; Perry et al., 2007). FMDV is highly transmissible virus and consider as trans-boundary disease (Grubman et al., 2004). The morbidity of FMD is high; the mortality is low in adult but high in young due to myocarditis (tiger heart disease) (Arzt et al., 2011). FMD virus have seven serotypes, O, A, C, South African Territories (SAT 1, SAT 2, SAT 3) and Asia-1. Different serotypes of FMD are immunogenically different and vaccination with one serotype does not develop immunity against other serotype or subtypes of a serotype (Paton et al., 2005; Callis et al., 1968).Various studies revealed that infected animals can excrete virus shortly before showing of any clinical signs and highest excretion occurs after showing clinical signs. Secretions from infected animal such as saliva, milk, nasal fluid and feces contains highest amount of virus which can cause disease outbreak. FMD virus also transmits through air; the airborne virus enters in respiratory track by inhalation, virus may also enter through oral ingestion and damaged epithelium. In some ruminant virus is not completely cleared from the pharynx, that animals are act as carriers for disease, which can further infect healthy animal (Alexandersen et al., 2003).

How to cite this article: MM Rahman, MA Jalil, KMM Hossain, KJ Alam, R Salam and MA Reza (2015). Occurrence of foot and mouth disease in cattle in Magura district of Bangladesh. International Journal of Natural and Social Sciences, 2(3): 1- 4.

High economic loss due to death of cattle population as well production fall (Ahmed, 1993) is reported in FMD outbreak. The most important economic influence of FMD is to decrease the productive performance of cattle (Chowdhury et al., 1991). Due to the high economic loss and zoonotic significant of FMD it is important to know the prevalence of FMD in order to take necessary measures against this disease in a particular area. Since there is no published report so far on prevalence of FMD in Magura district the present study is undertaken to determine the occurrence of FMD in cattle at Magura district in Bangladesh.

MATERIALS AND METHOD

Study area and animal

The study was conducted at the upazila Veterinary Hospital, Magura sadar of Magura district in Bangladesh. A total number of 669 (among them 221 case were infectious) cattle of different age, sex were examined, 83 cattle were infected with FMD.

Diagnosis of FMD

FMD was diagnosed in calves and adult cattle on the basis clinico-epidemiological determinants. The presence of fever and vesicular eruption in the mouth and on the feet of same animal with the history of rapid spread of the disease in bovine population were regarded as FMD. A pre-set questionnaire was filled containing various types of information regarding to demographic (age. sex, breed) management, previous disease and preventive measures during examination. Some confusing skin diseases were differentiated from FMD using respective laboratory test. However FMD was diagnosed based on entirely clinical findings.

Data analysis

Data recorded during sampling and laboratory findings were entered and stored in MS-Excel. The data were thoroughly screened for errors and properly coded before being subjected to statistical analysis using the Statistical Package for Social Sciences (SPSS) version 13.0 statistical software (SPSS, Inc., Chicago, IL, USA). The Pearson chi-square (($\chi 2$) test was used to compare categorical data, and to evaluate the difference in prevalence between groups. All P values were based on a two-sided test of statistical significance. Significance was accepted at the level of $P< 0.05$.

RESULT AND DISCUSSION

A total of 221 infectious disease cattle head were examined in this study period, among them 83 case was recorded and calculated prevalence rate was 37.56% among the infected individual. The finding of present study is agreed to Chowdhury et al., (1991) who reported 35.5% prevalence of FMD in cattle in Bangladesh. Melo et al., (2003) who reported 22.89% prevalence of FMD in cattle in South Asia, Mannan et al., (2009) who reported the prevalence of FMD is 24.52% at meghna, commila, in Bangladesh. Sarker et al., (2011) reported 25.07 %) prevalence of FMD in Rajshahi, Bangladesh. On the other hand, the findings of Hawlader et al., (2004) represent the prevalence of FMD in cattle was 63.41% at Baghabari, in Bangladesh. The variation in the rate of prevalence might be due to difference in geographical location, rearing system and age and breed of the animal.

Occurrence of FMD in relation to age

The prevalence of FMD in cattle with age categories <2 years, between 2 and 3.5 years and above 3.5 years was found to be 18.07%, 46.98% and 34.94%, respectively (Table 1). There was a statistically significant different ($p<0.05$) in prevalence associated with age of cattle. The occurrence of FMD in old age cattle of this study is supported by the study of Khan et al. (2002) who reported higher prevalence (37.44%) of FMD in old cattle compared to adult and young. The reasons of increased susceptibility to old cattle were due to malnutrition, poor immunity and poor management system. Sarker et al. (2011) FMD was significantly higher in old (36.53%) compared to adult (22.22%) and young (8.08%). However the occurrence of FMD was higher in adult in this study followed by old cattle which are differed from other studies (Mannan et al., 2009; Sarker et al., 2011) where higher prevalence were recorded in old cattle.

Occurrence of FMD in relation to sex

The results showed that the prevalence of FMD was significantly ($p<0.05$) higher in male (59.04%) than female (40.96%) indicating that the males were more susceptible to FMD than female. The result is in accordance with the study of Mannan et al. (2009) and Sarker et al. (2011). The findings of present study significantly differ from the findings of Hawlader et al. (2004) who reported FMD occur higher in females (68.01%) than in males (68.09%).

Occurrence of FMD in relation to breed

In the present study the occurrence of FMD was found more in indigenous cattle (63.86%) than crossed breed cattle (36.14%) indicating that indigenous breed is more susceptible that crossed breed. The higher occurrence of FMD in indigenous cattle might be due to household or free rearing system of cattle that enhance spread of the disease. However the rearing of crossed breed in intensive or semi intensive system may decrease the chance of occurrence of the disease.

Table 1
Occurrence of FMD in relation to demography of cattle in Magura district.

Demographic variables		Frequency	Percentage (%)
Age	Young(1 to≤2 yrs)	15	18.07
	Adult (>2 to ≤3.5yrs.))	39	46.98*
	Old (>3.5)	29	34.94
Sex	Male	49	59.04*
	Female	34	40.96
Breed	Indigenous	53	63.86*
	Crossed	30	36.14

* Significant at $p<0.05$

Table 2
Occurrence of FMD in relation to seasons of Magura district.

Seasons	Month	Number	Percent (%)
Rainy	July	2	2.41
	August	5	6.02
	September	8	9.64
	October	15	18.07*
Winter	November	23	27.71*
	December	13	15.66
	January	7	8.43
	February	4	4.82
Summer	March	1	1.20
	April	0	0.00
	May	2	2.41
	June	3	3.61

* Significant at $p<0.05$

The result in the present study showed the significant seasonal variation on the occurrence of FMD in cattle of Magura district. FMD was found higher in winter season followed by rainy season in this study. Highest prevalence (27.71%) was observed in November followed by October (18.07%) and December (15.66%). The occurrence of FMD was start to increase at the end of rainy season and was peak in winter season. However lower occurrence was observed in summer season. The results of this study are partially supported by the study of Mannan et al. (2009; Sarker et al. (2011).

It can be concluded that the occurrence of FMD in cattle of Magura district is high and its association with variation of the seasonal effect, age, sex and breed of cattle is significant. Considering the fact and zoonotic importance appropriate preventive measures and control strategy should be taken to prevent this disease in this area

REFERENCES

Ahmed (1993). Foot and Mouth Disease in Yak. Indian Veterinary Journal, 58: 421

Alexandersen S, Quan M, Murphy C, Knight J and Zhang Z (2003). Studies of quantitative parameters of virus excretion and transmission in pigs and cattle experimentally infected with foot and mouth disease virus. Journal of Comparative Pathology, 129: 268-282.

Arzt J, Baxt B, Grubman MJ, Jackson T, Juleff N, Rhyan J, Rieder E, Waters R and Rodriguez LL (2011). The pathogenesis of foot-and-mouth disease II: viral pathways in swine, small ruminants, and wildlife; myotropism, chronic syndromes, and molecular virus-host interactions. Transboundary Emerging Disease, 58:305-326.

Callis JJ, Mckercher PD and Graves JH (1968). Foot and mouth disease- A Review. Journal of American Veterinary Medical Association, 153: 1798-1802

Chowdhury SMZH, Rahman MB, Rahman MF and Rahman MM (1993). Foot and mouth disease and its effects on morbidity, milk yield and draft power in bangladesh. Ajas, 6(3): 423- 426.

Chowdhury SMZH, Rahman MB, Rahman MF and Rahman MM (1994). Strain of FMD virus in different district in bangladesh. Pakistan Veterinary Journal, 14:89-91.

Grubman MJ and Baxt B (2004). Foot-and-Mouth Disease. Clinical Microbiology Reviews, 2: 465-493.

Hawlader MMR , Mahbub-E- Elahi ATM, Habib S and Bhuyian MJU (2004). Foot and Mouth Disease in Baghabari milk shed area and its economic loss in Bangladesh. Journal of Biological Sciences 4(5): 581-583.

Mannan MA, Siddique MP, Uddin MZ and Parvez MM. (2009). Prevalence of foot and mouth disease (FMD) in cattle at Meghna upazila in Comilla in Bangladesh. Journal of Bangladesh Agricultural University, 7(2): 317-319.

Melo E, Saravia V and Astudillo V (2003). A Review of the FMD in countries of South Asia. Science and Technology Review, 21(3): 429-436.

Paton DJ, Valarcher JF, Bergmann I, Matlho OG, Zakharov VM, Palma EL and Thomson GR (2005). Selection of foot-and-mouth disease vaccine strains- A Review, Review Scientific Technical Office International Epizootics, 24: 981–993.

Perry BD and Rich KM (2007). Poverty impacts of foot and mouth disease and the poverty reduction implications of its control. The Veterinary Record, 160: 238-241.

Rufael T, Catley A, Bogale A, Sahle M and Shiferaw Y (2008). Foot and mouth disease in the Borana pastoral system, Southern Ethiopia and implications for livelihoods and international trade. Tropical Animal Health and Production, 40: 29- 38.

Sarker S, Talukder S, Haque MH and Gupta SD (2011). Epidemiological study on foot and mouth disease in cattle: Prevalence and risk factor assessment in Rajshahi, Bangladesh, Wayamba Journal of Animal Science, 578: 72-73.