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Prevalence of foot and mouth disease (FMD) in cattle at Meghna upazila in Comilla in Bangladesh

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Abstract

The present study was performed in the Upazila Veterinary Hospital, Meghna, Comilla during the period from September 2006 to February 2007 to observe the prevalence of Foot and Mouth Disease (FMD) in cattle at Meghna upazila in Comilla. A total of 253 skin diseased cattle head were examined in this study where 109 were males and 144 were females. The prevalence of FMD was 24.51% at Meghna upazila. The effect of age, sex, breed, season and farming system on the incidence rate of the disease was discussed. Seasonal variation on outbreak of this disease was significantly higher. The clinical prevalence of FMD was highest in the month of November (34.69%) and December (36.20%). The males (35.77%) were more susceptible than females (15.97%). The adult cattle (34.18%) were more susceptible compared to heifer (23.43%) and young (09.72%). In breed, 39.18% indigenous breeds and 15.38% crossed breeds were infected by FMD. So, it could be concluded that the rural farming system, adult, male and the indigenous cattle were more susceptible to FMD in winter season.

Keywords: Foot and Mouth Disease, Epidemiology, Clinical features, Breed

Introduction

Bangladesh is one of the most densely populated country in the South Asia of the world. Livestock is an important sub-sector in this country, considered to the backbone of agriculture. Foot and Mouth Disease (FMD) is an important viral disease of various animals. FMD is an extremely contagious, acute viral disease primarily of all cloven hoof animals like cattle, buffalo, pig, sheep and goat, characterized by fever and vesicular eruption in the mouth, nares, muzzle, foot, teats and other hairless soft areas of the body (Chowdhury *et al.* 1994). It is rarely fatal in adults but extremely fatal in calves. In young calves it causes myocardial degeneration, known as Tiger Heart disease (Gleeson *et al.* 2003). This virus is a member of the genus aphthovirus in the family of Picornaviridae. Seven serotypes of FMD virus such as O, A, C, SAT-1, SAT-2, SAT-3 and Asia-1 and at least 65 subtypes have been identified (Rahman and Mozumder, 1991). The viruses affect the susceptible animals within the range of 40 miles. About 17% of the cattle are affected in Eastern and Southern Asia (Gangopadhyay, 1990). The farmer become looser who use cattle for cultivating the land and the country loses leather and leather products which are the 3rd larger sector to earn the foreign money in Bangladesh. For better prevention and control strategy of FMD, the prevalence of this disease is a prerequisite before going to adapt any preventive or control activities. Therefore, the present study was conducted to know the prevalence of this disease in cattle at Meghna upazila in Comilla in Bangladesh.

Materials and Methods

This study was carried out in the Upazila Veterinary Hospital, Comilla, during the period from September 2006 to February 2007. A total of 253 cattle suffering with skin disease were examined where 109 were males and 144 were females. 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. The field diagnosis of this disease was confirmed based on clinical history collected from owner and clinical findings of the affected cattle according to Gleeson *et al.* 2003. Inspection, palpation, percussion and auscultation methods were used to examine the affected animal. Some confusing skin diseases were differentiated from FMD using respective laboratory and field test. However FMD was diagnosed based on entirely clinical findings. Data were analyzed by Chi-square (χ^2) test to observe the significant influence of management system, age, sex and breeds on the disease using Statistical Package for Social Science, SPSS Version 13.0 (Coakes *et al.* 2006).

Results and Discussion

A total of 253 cattle with skin disease were examined in this research work and 24.51% patients were found to have typical lesions of FMD which was very similar to the findings of Melo *et al.* (2003) who reported 22.89% prevalence in cattle in South Asia.

The results of prevalence study of FMD under various farming systems of cattle are presented in Table 1. A higher prevalence of FMD was reported in rural household farm (25.83%) than that of the intensive dairy farm (22.55%) that was correlated with the observation of Rahman *et al.* (1985). They found 28.18% prevalence in rural household farm and 19.87% in intensive dairy farm. The lowest prevalence in intensive dairy farm might be due to the improved management.

Table 1. Prevalence of FMD under various farming system

| Management system | Animal examined | Animals infected | Percentage (%) |
|---------------------------|-----------------|------------------|----------------|
| Intensive farm | 102 | 23 | 22.55 |
| Rural household farm | 151 | 39 | 25.83** |
| Total | 253 | 62 | 24.51 |
| Chi square Test (P-value) | 0.000** | | |

** Significant at $p < 0.01$

Prevalence of FMD considering various age groups of cattle was furnished in Table 2. The rate of susceptibility was highest (34.18%) in old cattle and lowest in young (09.72%). The heifer was 23.43% among them owing to better immunity. Khan Sarah *et al.* (2002) observed the higher prevalence (37.44%) of FMD in old cattle. The reasons of increased susceptibility to old cattle were due to malnutrition, poor immunity and poor management system.

Table 2. Prevalence of FMD at different age groups of cattle

| Age | Animal examined | Animals infected | Percentage (%) |
|---------------------------|-----------------|------------------|----------------|
| Young | 72 | 07 | 09.72 |
| Heifer | 64 | 15 | 23.43 |
| Old | 117 | 40 | 34.18** |
| Total | 253 | 62 | 24.51 |
| Chi square Test (P-value) | 0.000** | | |

** Significant at $p < 0.01$

The results of Table 3 showed the prevalence rate in male and female cattle indicating higher prevalence in males (35.77%) than that of females (15.97%) which apparently similar with the observation (33.41% in male and 17.32% in female) of Remond *et al.* (2002). Male animals usually used in draft purposes which enhanced the chances of skin damage that lead to higher susceptibility to FMD.

Table 3. Prevalence of FMD in both sexes of cattle

| Sex | Animal examined | Animals infected | Percentage (%) |
|---------------------------|-----------------|------------------|----------------|
| Male | 109 | 39 | 35.77** |
| Female | 144 | 23 | 15.97 |
| Total | 253 | 62 | 24.51 |
| Chi square Test (P-value) | 0.000** | | |

** Significant at $p < 0.01$

The susceptibility of various breeds of cattle to FMD is shown in Table 4. In the present investigation, however a significant ($p < 0.01$) variation in breed susceptibility was observed affecting mostly indigenous cattle (39.18%) which was nearly supported by the observation of Remond *et al.* (2002), they found 36.87% infectivity in indigenous cattle. In a separate study, Samuel and Knowles (2001) recorded 41.77% infectivity in the local animals in Ethiopia. This higher incidence in indigenous cattle might be due to high chance of getting exposure as use for cultivation and no regular vaccination compared to crossed breed.

Table 4. Prevalence of FMD in different breeds of cattle

| Name of the breed | Animal examined | Animals infected | Percentage (%) |
|---------------------------|-----------------|------------------|----------------|
| Indigenous breeds | 97 | 38 | 39.18** |
| Crossed breeds | 156 | 24 | 15.38 |
| Total | 253 | 62 | 24.51 |
| Chi square Test (P-value) | 0.000** | | |

** Significant at $p < 0.01$

The result of Table 5 shows the seasonal prevalence of FMD that gradually increased from September (14.29%) to October (20.00%) to November (34.69%) to December (36.20%) and then declined in the month of January (30.55%) and February (04.25%). The results of prevalence of FMD at different months were also referred to the report of Khan Sarah *et al.* (2002) who suggested higher prevalence in winter seasons.

Table 5. Prevalence of FMD at different seasons

| Name of the months | Animal examined | Animals infected | Percentage (%) |
|---------------------------|-----------------|------------------|----------------|
| September, 2006 | 28 | 04 | 14.29 |
| October, 2006 | 35 | 07 | 20.00 |
| November, 2006 | 49 | 17 | 34.69** |
| December, 2006 | 58 | 21 | 36.20** |
| January, 2007 | 36 | 11 | 30.55 |
| February, 2007 | 47 | 02 | 04.25 |
| Total | 253 | 62 | 24.51 |
| Chi square Test (P-value) | 0.000** | | |

** Significant at $p < 0.01$

In conclusion, it may be mentioned that the disease is mainly seen in rural household farm (25.83%) compared to intensive dairy farm (22.55%). Higher incidence rate was recorded in old (34.18%), male (35.77%) and in indigenous cattle (39.18%). Outbreak of this disease was the highest in November (34.69%) and December (36.20%). Management systems, age, breed and sex of animals had highly significant ($p < 0.01$) influence on the FMD. Therefore, appropriate preventive measures and control strategy should be taken to prevent this disease in Bangladesh.

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