FARMERS’ KNOWLEDGE, ATTITUDE AND PRACTICES OF MASTITIS IN DAIRY COWS AT SELECTED AREAS OF BANGLADESH

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ABSTRACT
The research work was designed to assess farmers’ knowledge, attitude and practices about bovine mastitis. The data were collected by using structured questionnaire through face to face interview techniques among the 65 dairy farmers of Dhaka, Mymensingh, and Gazipur. Disproportionate stratified random sampling was used to select the farmers based on study areas. Most of the studied farms are small (75.4%) in the studied area, only a few (10.8%) farms were large in Dhaka. In Gazipur and Mymensingh almost (86.2%) farms were small and rest of (13.8%) was medium. According to farmer’s knowledge, major cause of mastitis was microorganisms (46.15%), but 20% farmer reported that it is due to injury and 27.69% farmer don’t know the causes of the mastitis. Most of the farmers (87.7%) think that the source of infection is unhygienic floor, but others have no clear conception about it. Before milking only 23.10% farmers’ wash the whole udder where 58.5% used single towel. About 76.9% farmers have no knowledge of screening mastitis and only 9.2% of total farmers performed regular mastitis checking. Among the farmers, 55.4% are used antiseptic solution during washing the floor and others wash their floor only by water. Highest number of farmer use Tube well water (44.6%) for daily management of their farms. Most of the farmer takes suggestions from village doctor or pharmaceutical representative (64.62%) for maintaining the diseases condition. This study recommends that identification of factors associated with sub-clinical mastitis will help to take necessary steps to reduce the prevalence of sub-clinical mastitis. The most effective way to control sub-clinical mastitis is to take preventive measures such as regular cleaning of the floor, keeping the udder clean, milkman’s cleanliness, and dry cow therapy especially in high yielding dairy cows.

Keywords: Dairy cows, KAP, mastitis, risk factors

INTRODUCTION
The economy of Bangladesh is based primarily on agriculture; livestock is an essential component of the rural economy and the livelihood of the subsistence farmers. The country has a sub-tropical monsoon climate and most of the population is living in rural areas. Bangladesh has a suitable environment for the rearing of cattle. Animal production is one and a very important facet of agriculture. In the tropics it is no less important than in developed countries. Dairying is a good source of income to the small and marginal farmers. The feed required for milk production can be met from their limited land resources as most of the animals are ruminants and the majority of their food can be derived from forages, coarse roughages and agricultural byproducts, without incurring much additional cost. Diseases of these dairy cows are also a threat to this sector. Among the diseases mastitis is a significant one and most of the farmers are under the threat of mastitis. (Rahman et al., 2010)

Mastitis is the inflammation of the parenchyma of mammary glands regardless of the cause, and it is characterized by a range of physical and chemical changes in the milk and pathological changes in the glandular tissue (Radostits et al., 2007). It is the most prevalent infectious diseases of dairy cows (Andrews et al., 2004). Mastitis is said to be subclinical when there is evidence of inflammation, e.g., a high somatic cell count in the

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milk without any visible abnormality of the milk or udder (Radostits et al., 2007). Subclinical mastitis (SCM) is a major problem affecting dairy animals all over the world. It is 15 to 40 times more prevalent than clinical mastitis and causes high economic losses in most dairy herds and responsible for much greater loss to the dairy industry in Bangladesh (Kader et al. 2003). In Bangladesh, the prevalence of SCM is recorded from 20 to 44 % at cow level based on California Mastitis Test (CMT) (Rahman et al., 2009; Islam et al., 2010; Rabbani and Samad, 2010).

The primary cause of mastitis in cattle, goats and sheep are well-recognized groups of microorganisms such as Streptococcus sp., Staphylococcus sp., Pasteurella sp. and Escherichia coli, Enterobacter sp. and Klebsiella sp. The source of infection is contagious pathogens, environmental pathogens and other pathogens (Khan and Muhammad, 2005). Mastitis is caused by many different infectious agents commonly divided into contagious pathogens (Streptococcus agalactiae, Staphylococcus aureus, Mycoplasma bovis) causing contagious mastitis and Environmental pathogens (Streptococcus iberis, Streptococcus dysgalactiae) are most prevalent and Gram negative bacteria (Escherichia coli, Klebsiella sp., Citrobacter sp., Enterobacter sp. etc.) causing environmental mastitis (Radostits et al., 2000). There are numerous risk factors identified by many researchers that influence the occurrence of subclinical mastitis such as age, parity, lactation stage, milk yield, breed, previous mastitis record, floor type, disinfection of fingers and teat dipping, etc. (Doherr et al., 2007; Karimuribo et al., 2008; Madut et al., 2009).

However, proper milking procedure and hygiene may be the easiest and most economical way to control intramammary infections (Hutton et al., 1990). Teat and udder skin should be healthy before milking and free of sores, wounds, or chapping where S. aureus could colonize the teat end and surrounding skin (Fox and Norell, 1994). Cleanliness at milking time is also important. Minimal use of water and pre-milking teat antisepsis may reduce new intramammary infections. Additionally, the advent of post milking teat antisepsis has been important in contributing to decreasing contagious IMI. When teats were dipped after milking and cows were treated with penicillin-dihydrostreptomycin at dry-off, intramammary infections caused by major mastitis pathogens decreased by 75% and 45%, respectively. Post-dipping alone has been estimated to decrease the rate of new IMI by 50% (Nickerson and Boddie, 1997).

In Bangladesh, there are some reports on the magnitude of the disease. But information relating to its risk factors related to farmers knowledge, attitude and practices is scant (Kahir et al., 2008; Uddin et al., 2009). Such information is important to understand the farmers’ perspective regarding mastitis and when designing appropriate strategies that would help reduce its prevalence and effects. This paper systematically describes the farmers’ knowledge, attitude and practices of mastitis in lactating dairy cows in selected areas of Dhaka, Mymensingh, and Gazipur districts of Bangladesh.

METHODOLOGY

Study design, study population and sample size

A cross-sectional study was carried out from September to December, 2016 among the 65 dairy farmers of Dhaka (n=30), Mymensingh (n=20) and Gazipur (n=15). Disproportionate stratified random sampling was used to select the farmers based on study areas, i.e., the farmers were divided into three strata on the basis of farm size (Small: <20 cows, Medium: 20-60 cows and Large: >60 cows), and then a simple random sample was selected within each stratum in such a way that different strata did not have the same sampling ratio.

A well-structured questionnaire was used focused on the knowledge, attitude and practices (KAP) of farmers regarding the disease mastitis. Questionnaire was prepared into three consecutive sections to obtain three objectives of this study.

Data collection

Data were collected by face to face interview. Questionnaire was prepared in English but during data collection question was asked in Bangla. Before data collection farmer’s consent was taken. Number of respondents was 65 for data collection.
Data analysis
The collected data were accumulated, grouped and interpreted according to the objectives of the study. All the data were compiled by Microsoft Excel and descriptive analysis was done SPSS IBM 20.

RESULTS AND DISCUSSIONS
This study is performed to know the farmers’ knowledge, attitude and practice of mastitis in selected areas. Most of the studied farms are small (75.4%) in the studied area, only a few (10.8%) farms were large in Dhaka. In Gazipur and Mymensingh almost (86.2%) firms were small and rest of (13.8%) was medium.

According to farmer’s knowledge, major cause of mastitis was microorganisms (46.15%), but 20% farmer reported that it is due to injury and 27.69% farmer don’t know the causes of the mastitis. Most of the farmers (87.7%) think that the source of infection is unhygienic floor. But others have no clear conception about it. About 76.9% farmers have no knowledge of screening mastitis and only 9.2% of total farmers performed regular mastitis checking.

Among the farmers, 55.4% are used antiseptic solution during washing the floor and others wash their floor only by water. Highest number of farmer use Tube well water (44.6%) for their farms. Most of the farmer takes suggestions from village doctor or pharmaceutical representative (64.62%) for maintaining the diseases condition. Details results were shown in Table 1.

Mastitis is a difficult problem to comprehend because, it is a disease caused by many factors, both in large and in small-scale herds. Micro-organisms are responsible for the infection, but for them to enter the mammary gland and establish themselves to the point that they cause an infection, a multitude of factors may be involved. There are many factors acting simultaneously, and the disease generally involves interplay between management practice and infectious agents, but with other factors, such as genetics, udder shape or climate. (Awale et al., 2012; Sori et al., 2005).

Being aware that especially sub-clinical mastitis is highly spread through herds in developing countries like Bangladesh, it is important to identify risk factors and to assess their contribution to the occurrence of the disease. Identification of area-specific and/or farm-specific risk factors is important for the design of control programmes for mastitis in cows (Almaw, 2004; Molla and Melaku, 2012).

All of the farmers clean the teats of dairy cows with running water prior to milking, but, as observed earlier (Mungube et al., 2004), the implementation of mastitis preventive measures such as using separate drying cloths for each cow, and practicing pre- and post-milking teat dipping are noted to be infrequent amongst the farmers. In our survey 58.5% farmers use single towel and 41.5% farmers use no towel at all to clean the teat where a lower prevalence of both clinical and sub-clinical mastitis has been reported on farms where separate towels for teat cleaning and post-milking teat dipping were routinely practiced (Kivaria et al., 2007). Despite the fact that some of these risk factors are not found to be significant in study, presumably due to low sample sizes, the need to implement mastitis preventive measures such as the use of pre-milking and post-milking teat dipping cannot be overemphasized.

Prevalence of mastitis depends on the frequency of floor cleaning. All farmers were aware about the floor hygiene. The prevalence of mastitis was also significantly affected by floor conditions (completely dry vs. partly or completely wet and soiled floor). This can be explained by the fact that farms with soil floor would dry more quickly than the brick floor (Sharma et al., 2008). As a result soiled floor animal were less affected than brick block floor. But wet soiled floor (less absorbable) are most harmful for dairy animal to cause mastitis. It appeared that the floor was a potential source for mastitis organisms to enter the udder through the teat orifice (Wakwoya et al., 2006).
Table 1. Farmers knowledge, attitude and practice of mastitis in selected Farms (N=65)

| Sl. No. | Parameter of farmers’ Knowledge, attitude and practice | Frequency (%) |
|---------|--------------------------------------------------------|----------------|
| 1       | Aware of mastitis                                       |                |
|         | Yes                                                     | 64 (98.5%)     |
|         | No                                                      | 1 (1.5%)       |
| 2       | Cause of mastitis                                       |                |
|         | Microorgan                                              | 30 (46.15%)    |
|         | Malnutrition                                            | 4 (6.15%)      |
|         | Injury                                                  | 13 (20.0%)     |
|         | Unknown                                                 | 18 (27.69%)    |
| 3       | Source of infection                                     |                |
|         | Unhygienic floor                                        | 57 (87.7%)     |
|         | Instruments/ Due to sucking                             | 3 (4.62%)      |
|         | Unknown                                                 | 5 (7.70%)      |
| 4       | Cow to cow Transmission                                 |                |
|         | Yes                                                     | 8 (12.3%)      |
|         | No                                                      | 57 (87.70%)    |
| 5       | Knowledge of screening mastitis                          |                |
|         | Yes                                                     | 15 (23.1%)     |
|         | No                                                      | 50 (76.9%)     |
| 6       | Regular mastitis checking                               |                |
|         | Yes                                                     | 6 (9.2%)       |
|         | No                                                      | 57 (87.7%)     |
|         | Sometimes                                               | 2 (3.1%)       |
| 7       | Taking prevention measure before onset of clinical symptoms |            |
|         | Positive                                                | 61 (93.8%)     |
|         | Negative                                                | 4 (6.2%)       |
| 8       | Mastitis occurred within one year of his/her farm       |                |
|         | Yes                                                     | 58 (89.2%)     |
|         | No                                                      | 7 (10.8%)      |
| 9       | Necessary of hygienic floor                             |                |
|         | Positive                                                | 65 (100%)      |
|         | Negative                                                | 0 (0%)         |
| 10      | Floor type                                              |                |
|         | Soil                                                    | 30 (46.15%)    |
|         | Brick block                                             | 35 (53.85%)    |
| 11      | Necessary of antiseptic use                              |                |
|         | Positive                                                | 56 (86.2%)     |
|         | Negative                                                | 9 (13.8%)      |
| 12      | Udder cleaning                                          |                |
|         | Yes                                                     | 65 (100%)      |
|         | No                                                      | 0 (0%)         |
| 13      | Using of antiseptic by farmers                          |                |
|         | Yes                                                     | 29 (44.6%)     |
|         | No                                                      | 36 (55.4%)     |
| 14      | Hand-washing of milkman                                 |                |
|         | Yes                                                     | 64 (98.5%)     |
|         | No                                                      | 1 (1.5%)       |
| 15      | Method of udder preparation before milking               |                |
|         | Wash whole udder                                        | 15 (23.1%)     |
|         | Wash only teat                                          | 50 (76.9%)     |
| 16      | Using of cloth during udder/teat wash                   |                |
|         | Single towel                                            | 38 (58.5%)     |
|         | Separate towel                                          | 0 (0.0%)       |
|         | No towel                                                | 27 (41.5%)     |
| 17      | Type of lubricant used by farmers                       |                |
|         | Oil                                                     | 61 (93.8%)     |
|         | Petroleum jelly                                         | 4 (6.2%)       |
| 18      | Water source in farm                                    |                |
|         | Pond                                                    | 0 (0.0%)       |
|         | Tube well                                               | 29 (44.6%)     |
|         | Pump                                                    | 22 (33.8%)     |
|         | WASA                                                    | 9 (13.8%)      |
|         | Others                                                  | 5 (7.7%)       |
| 19      | Advice taken by farmers                                 |                |
|         | Veterinary surgeon                                      | 23 (35.38%)    |
|         | Others (Village doctor, pharmaceutical company personnel)| 42 (64.62%)    |
| 20      | Information about CMT kit                               |                |
|         | Known                                                   | 19 (29.2%)     |
|         | Unknown                                                 | 46 (70.8%)     |
In conclusion, the study shows that different factors are significantly associated with the occurrence of subclinical mastitis, which needs to be considered in the control of the disease. Research revealed that farmers are aware about the disease but they have some misconception about disease. Workshop and training should be arranged for the dairy farmers’ for better management practices of sub-clinical mastitis. In addition, frequent cleaning should be done in the barns of straw fed cows so that fewer amounts of straws are left to contaminate the barn environment mixed with urine, feces, and other wastes.

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