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ORIGINAL ARTICLE

Retrospective study of farm animal diseases presented to Atpara Upazila veterinary hospital, Netrakona, Bangladesh

R. Majumder[1,*], M. S. Parvin[2,*], N. N. Shohana[3], M. A. Islam[2], M. T. Islam[2], A. K. M. A. Rahman[2], S. A. Rony[3,✉]

[1]Upazila Livestock Officer (Leave Reserve), Department of Livestock Services, attachment: Rabies Vaccine Production Section, Livestock Research Institute, Mohakhali, Dhaka-1212, Bangladesh
[2]Department of Medicine, Faculty of Veterinary Science, Bangladesh Agricultural University, Mymensingh -2202, Bangladesh
[3]Department of Parasitology, Faculty of Veterinary Science, Bangladesh Agricultural University, Mymensingh -2202, Bangladesh

Email of authors: R.M. (rumivet@gmail.com); M.S.P. (soniaparvin@bau.edu.bd); N.N.S. (shohana.1501108@bau.edu.bd); M.A.I. (aminul.vmed@bau.edu.bd); M.T.I. (taohid@bau.edu.bd); A.K.M.A.R (arahman_med@bau.edu.bd)

Abstract

Background: The field veterinary hospital records serve as indispensable sources of valuable information on various farm animal diseases of the respective areas. The current retrospective study was conducted to determine the distribution of clinical diseases of farm animals presented to Atpara Upazila veterinary hospital from January 2007 to December 2010.

Methods: Animal, disease and related data from the official register books were stored using the Microsoft Excel spreadsheet program 2010. Descriptive statistics were performed and expressed as the percentage of disease and conditions with a 95% confidence interval.

Results: Of the total 6825 clinical cases recorded from the patient register, cattle, goats and sheep were presented at 87.15%, 12.75% and 0.1%, respectively. The vast majority cases were medicinal (91%) followed by gyneco-obstetrical (6%) and surgical (2%) cases. According to etio-pathological nature, the most commonly observed disease categories were parasitic (20.35%), fever (4.67%), dermatitis (6.65%), metabolic and nutritional deficiency disorders (4.59%), anorexia (2.83%), diarrhea (2.52%), arthritis (1.47%), bloat (1.32%), pneumonia (1.29%), and FMD (1.27%). A higher proportion of female cattle and goats were presented compared to that of the males. Similarly, more adult animals were presented as clinical cases than young animals.

Conclusions: Among the clinical cases in the study area, parasitic diseases were commonly prevalent irrespective of season and host. Appropriate strategic measures should be adopted to control such infection in the study area to minimize farm production loss.

Keywords: Parasite, metabolic, nutritional deficiency, dermatitis, anorexia, diarrhea

[*] Equally contributed first author

✉Correspondence: s.a.rony@bau.edu.bd

Introduction

Livestock are the integral part tothe mixed farming system in Bangladesh accounting for a population of 24.39 million cattle, 1.49 million buffaloes, 3.61 million sheep and 26.4 million goats (Department of Livestock Services, 2020). Livestock are crucial for the livelihoods of poor farmers, consumers, traders and laborers throughout the developing world (Herrero *et al*., 2013). Animal diseases and zoonoses are serious drawbacks to efficient livestock production and safe utilization of animal products worldwide (Perry and Grace, 2009). The serious socio-economic consequences include production losses, loss of livelihoods, poverty, food insecurity, restriction of marketing opportunities, disincentives to investment and public-health risks (FAO, 2016). However, animal disease control strategies are not uniform across the world, with many countries continuing to experience serious outbreaks. Globalization, climate change, clustering of farms around urban areas and movement of animals, people and pathogens between intensive and traditional farming systems are promoting the emergence of new disease risks and intensifying the endemic old ones (Hassell *et al*., 2017). More commonly, in many developing countries like Bangladesh, the rapid expansion of livestock production is not still accompanied by commensurate investments in veterinary services and animal welfare issues resulting in the endemic outbreaks of FMD, anthrax, PPR, lumpy skin disease, bovine ephemeral fever and so on. As a consequence, in spite of several control approaches practiced in Bangladesh for animal health protection, diseases along with malnutrition appear as the pivotal hindrances in livestock development.

Veterinary hospitals and clinics may help in understanding the geographic and environmental sources of diseases and their natural history (Habremariam and Adams, 1981). In the current settings of the department of livestock services (DLS) in Bangladesh, DVH (District Veterinary Hospitals), Regional FDIL (Field Diseases Investigation Laboratories), and the CDIL (Central Disease Investigation Laboratory of DLS are responsible for providing diagnostic services (DLS, 2013). Limited veterinary services, inadequate data on most prevailing diseases, insufficient disease diagnostic facilities and a little disease surveillance program are highly significant obstacles to livestock development in Bangladesh (Department of Livestock Services, 2007; Mia, 2013). Being the bottom-line unit of the Department of Livestock Services, the Upazila livestock office and Veterinary hospital continuously provide services like diagnosis, treatment of animal diseases and extension activities to the farmers and officially maintains the records of encountered clinical cases. Thus, veterinary hospital and affiliated department records serve as indispensable sources of valuable information on various diseases and could be used as a tool for tracking and improving population health and identifying emerging infectious diseases. These records can potentially contribute to the understanding of the natural history and risk factors of animal diseases, the efficacy of treatment and procedures, and the prevention of zoonotic diseases (Krone *et al*., 2014). Through retrospective studies, disease occurrences, frequency and determinants in a population can be identified cheaply and quickly as historical data are already recorded (Tofthagen, 2012).

Veterinary clinicians are equipped with knowledge, and familiar with the type of organisms that produce infection and the relative prevalence of each of those organisms in the area starting from the most to the least probable hypothesis. All these veterinarians use a combination of clinical and epidemiological approaches in their day-to-day work. As the Upazila veterinary hospital is basically aimed at livestock health service and partially as a teaching-training center, information and insights on clinically presented farm animal diseases has fundamental value for practitioners, students and farmers of the area covered.

Several reports on clinical case records are available in different parts of Bangladesh (Debnath *et al*., 1990; Sarder *et al*., 2010; Rahman *et al*., 2012; Ullah *et al.*, 2013; Karim *et al*., 2014; Maruf *et al*., 2014; Maruf *et al*., 2014; Noman *et al*., 2014; Parvez *et al*., 2014; Sarker *et al*., 2014a; Sarker *et al*., 2014b; Debnath *et al*., 2015; Islam *et al*., 2015; Munsi *et al*., 2015; Sarder *et al*., 2015; Sarker *et al*., 2015; Siddiki *et al*., 2015; Fakhrul-Islam *et al*., 2016; Hossain *et al*., 2016; Islam *et al.*, 2016; Lucky *et al*., 2016; Samaddar *et al.*, 2016; Mohammed *et al*., 2017; Nahian *et al*., 2017; Alam *et al*., 2018; Khan *et al*., 2018; Sen *et al*., 2018; Islam *et al*., 2019). All these studies reveal that parasitic diseases are very common throughout the country. Parasites, both endo and ecto are highly conducive to the subtropical climate of Bangladesh resulting in a potential constraint for profitable livestock production. Unfortunately, very few retrospective studies emphasized parasitoses and a similar reports on farm animals are very limited for Netrakona which is a low-lying haor area of Bangladesh, having diversified ecosystems responsible for different farm animal parasites. Moreover, epidemiological information on the disease prevalence and recognition of risk factors in different regions or localities is a prerequisite to develop appropriate control strategies. Therefore, this retrospective study was to generate baseline data on the major occurring diseases and their associated determinants in farm animals at Atpara Upazila Veterinary Hospital, Netrakona.

Materials and methods

Study area and population

Origin of the study animals were throughout the Atpara Upazila of Netrakona district (Figure 1). This Upazila area is 195 sq km, located in between 24°44' and 24°52' north latitudes and in between 90°46' and 90°59' longitudes. It is surrounded by Barhatta Upazila on the north, Kendua and Madan Upazilas on the south, Netrakona Sadar Upazila on the east, Mohanganj Upazila on the west. Water bodies in the area include Mongra, Bauri, Ghorautra, Chhila and Tushai, Kamroilbeel, Atshibeel and Ukhro canal (http://en.banglapedia.org/index.php/Atpara_Upazila).

Animals presented to the Atpara Veterinary Hospital, were mostly kept in semi-intensive management system; feed with concentrates and hay; water available free throughout the day time. Calves, sheep and goats were left to graze road sides. Most cattle are indigenous zebu and Holstein-Zebu crossbred kept for dairy purpose; most of them were females. In the surroundings of Atpara, animals were kept close to the households and allowed to graze crop-free lands. Crop residues were given for oxen and cows when there is scarcity of pasture to graze at the late dry season. However, supplementary feeding for draft oxen, milking cows, and beef cattle was not uncommon.

Ethical considerations

Prior consent was taken from the concerned authority to use the data for this study

Source, collection approach and management of data

Data source for this study was the patient register of Upazila veterinary hospital during January 2007 to December 2010. Data were collected on different variables like species, age, sex, clinical findings, clinical diagnosis and treatment given.

Methods of disease diagnosis implemented for the clinical cases

We used existing disease records for this study however the following procedures are routinely performed for the diagnosis of diseases at the Upazila veterinary hospital.

General examination

Distant inspection is performed to assess the general appearance, physical condition or behavioral abnormalities from a short distance without handling the animal. Different body regions, especially regional lymph nodes, mammary glands and other genital organs,

sensory organs, skin etc. are also visually inspected.

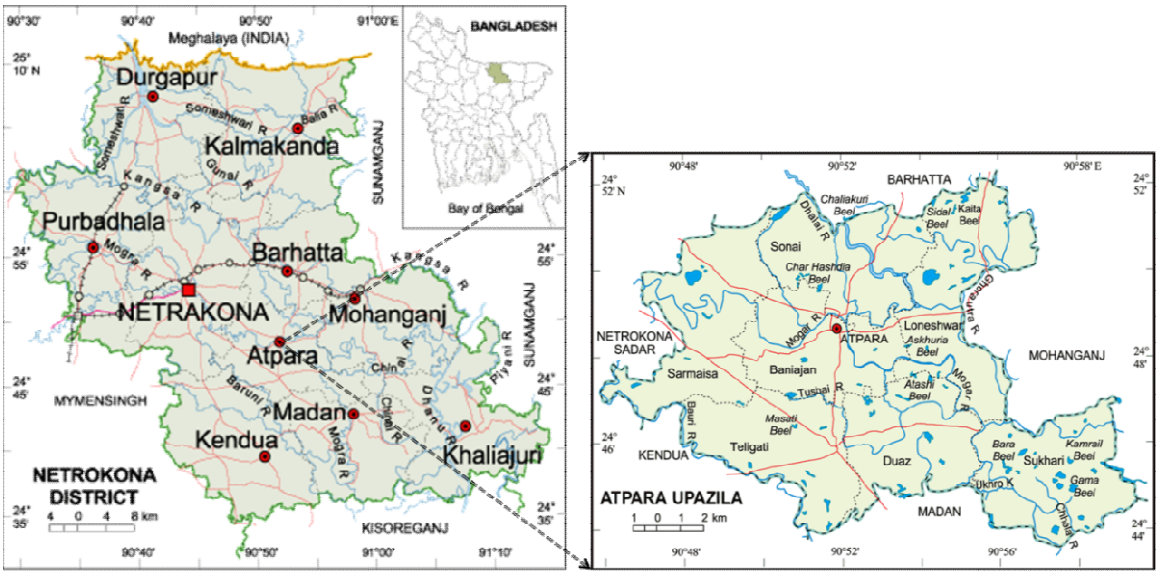

Figure 1.The map of Atpara Upazila under Netrakona district in Bangladesh where the study was conducted.

Physical examination

The physical examination is performed through close inspection, palpation, percussion, auscultation or modified methods. Animals are properly restrained if necessary prior to physical examination.

Specimen collection and examination

Based on the owner's complain, patient history and findings of general and physical examination, appropriate samples are routinely collected and examined through microscopy and other laboratory techniques as required. Wherever endoparasitic cases are suspected, fecal samples are collected and examined through direct microscopy, floatation or sedimentation method.

Categorization of diseases and variables

Cases due to metritis, abortion, retained fetal membrane, vaginal prolapse, cystitis, uterine torsion, pyometra, dystocia and orchitis are categorized into problems of reproductive tract. Cases of saddle sore, yoke sore, mechanical injury and any wound produced due to any trauma are categorized into cases of wound. Cases other than surgical and gynaeco-obstetrical problems are considered as medicinal cases.

In age category, 0 to 6 months for sheep and goat and 0 to 2 years for cattle are considered young. The major three seasons are categorized as rainy season (July to October), winter season (November to February) and summer season (March to June).

Statistical Analysis

Data from the register books were stored in personal computer, using Microsoft Excel spreadsheet program 2007. The dataset was reviewed and checked for coding of all variables. Descriptive statistics were performed and expressed as the percentage of presumptive disease and conditions with 95% confidence interval (CI).

Results and discussion

Species-, sex- and age-wise distribution of clinical cases

Host species, sex and age are significantly important predisposing factor for disease pathogenesis. Cattle, goats and sheep are major farm animals in Bangladesh. As noticed in table 1, among the total 6845 cases recorded, bovine species represented the largest number of cases (87.15%), followed by caprine (12.75%) and ovine (0.1%). Most of the goats reared in Bangladesh are Black Bengal and those are known to be relatively resistant or less susceptible to infection (Siddiki *et al*., 2019). Moreover, reports of common disease resistance in cattle are not well documented while comparing with goat.

For all three species, clinically-ill female animals were higher in number compared to their male counterparts. The proportion of bovine male was 45.81% and bovine female was 54.19 %. Clinically sick female goats were 56.44%. Our findings were further supported by several previous studies (Parvez et al., 2014; Debnath et al., 2015). The number of sheep recorded in this study was quite low and insignificant. Higher proportion of clinical cases for female indicated that female animals suffered more from diseases or disorders and were more susceptible compared to male. This result might have been attributed from the immunocompromised state of female resulting from physiological states, hormones, pregnancy, lactation etc.

According to this study, older subjects were less clinically affected compared to young one. Around 75.60% of young cattle and 24.40% of older cattle aged over 2 years were presented in the study. In case of goat, 65.28% of patients were young aged below and 34.72% were old, aged over 6 month. Our findings were in accordance with other authors (Parvez *et al*., 2014; Debnath *et al*., 2015). Findings of this study potentially indicate that age susceptibility is applicable for various farm animal diseases as well as vary from species to species.

Overall proportionate prevalence of clinical cases and disease- disorders

It was observed that 92% of the total cases represent medicinal category (Figure 2). Among disease and disorders, the predominant proportionate prevalence were for parasitic diseases (20.35%), dermatitis (6.65%), fever 4.67%, metabolic and nutritional disorders (4.59%), anorexia 2.83%, diarrhea 2.52%, arthritis (1.47%), bloat (1.32%), pneumonia (1.29%) and FMD (1.27%) (Figure 3). Our observation supports the earlier report of Rahman *et al*., (2012) and Karim *et al*., (2014). Rahman *et al*., (2012) recorded 84.1%, 4.7% and 11.20% and Karim *et al*., (2014) recorded 86.5%, 6.1% and 7.3% of medicinal, gynaeco-obstetrical and surgical cases, respectively. However, Rahman *et al*., (2013) recorded medicinal cases (cattle 84.1% and goat 81.0%) in comparison to gynaeco-obstetrical (cattle 4.7% and goats 1.1%) and surgical (cattle 11.2% and goats 17.9%) cases. Samad (2019) summarized 81.19% medicinal cases, 10.03% surgical and 8.78% gynaeco-obstetrical clinical cases in cattle based on the last 50 years research articles. Hossain *et al*., (2016) reported 36.54% of parasitic cases (ecto and endo parasites) which is relatively higher compared to the findings of our current study. Because of the ease of coproscopic examination of parasitic ova, cysts, oocysts besides common clinical manifestations, might have contributed to the high proportion of parasitic disease diagnosis under this study.

Parasite-specific proportionate prevalence

Bangladesh is the most disaster-prone land in addition to be the victim of global climate change and serve as a rich reservoir of helminths, protozoa and arthropods of vetero-medical importance still now. Netrakona being in a low lying topography (Affroze *et al*. 2013), could facilitate the growth, survival and transmission of parasites, especially gastrointestinal parasites. Results of our study revealed that among the parasitic diseases, prevalence of stomach worm infestation (80.05%) was highest followed by ectoparasitic infestation (6.48%), fascioliasis

(5.60%), coccidiosis (4.96%) and ascariasis (2.90%) (Table 2). Among the medicinal cases in cattle, highest percentage of cases was also with parasitic diseases (50.4%). Caprine parasitic diseases (20.4%) were reported to be the second highest cases in a previous study (Rahman *et al*., 2012). Samad (2019) reported fascioliasis (66.16%), humpsore (22.45%), gastro-intestinal nematodiasis (17.44%), ascariasis (12.17%) and tick infestation (15.71%) in cattle. Rashid *et al*., (2015) found 7.39% *Strongyloides*, 6.96% *Haemonchus*, 5.65% *Trichuris*, 2.17% *Capillaria*, 3.91% *Fasciola gigantica* and 2.17% *Moniezia* in Brahman cross-breed cattle besides other enteric protozoan. The differences in prevalence with other studies might be affected by the geography, host animal, and study period and design. Having direct lifecycle of stomach worm infection, maintenance of the cycle is quite easy and expected to be high. Because of high abundance of flowing water, water bodies, vector snails, prevalence of fascioliasis is also rationale. Ascariasis is common parasite in domestic animals as no intermediate host is required and ascarid eggs remain infective for a long time in the environment. Hence natural grazing in the ascarid egg contaminated area can provide the inoculum of infection.

Table 1. Demographic distribution of total cases reported between 2007 and 2010 at Atpara Upazila Veterinary Hospital in Netrakona, Bangladesh

Species	Sex		Age		Total (% of total cases, 95% CI)
	Male (%, 95% CI)	Female (%, 95% CI)	Young (%, 95% CI)	Adult (%, 95% CI)	
Cattle	2725 (45.81	3223 (54.19)	4497 (75.60)	1451 (24.40)	5948 (87.15)
Goat	379 (43.56)	491 (56.44)	568 (65.28)	34.72 (302)	870 (12.75)
Sheep	2 (28.57)	5 (71.43)	4 (57.12)	3 (42.86)	7 (0.1)
Total cases					6825

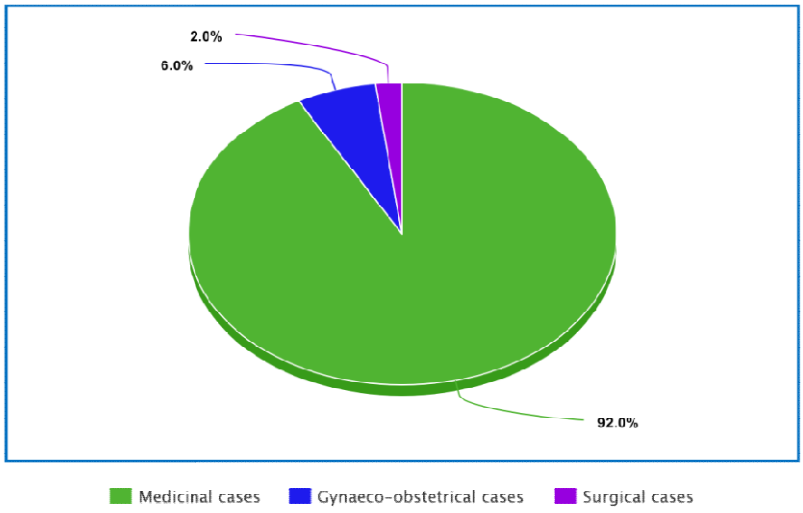

Figure 2. Proportion of three major types of clinical cases

Farm animal parasitic diseases

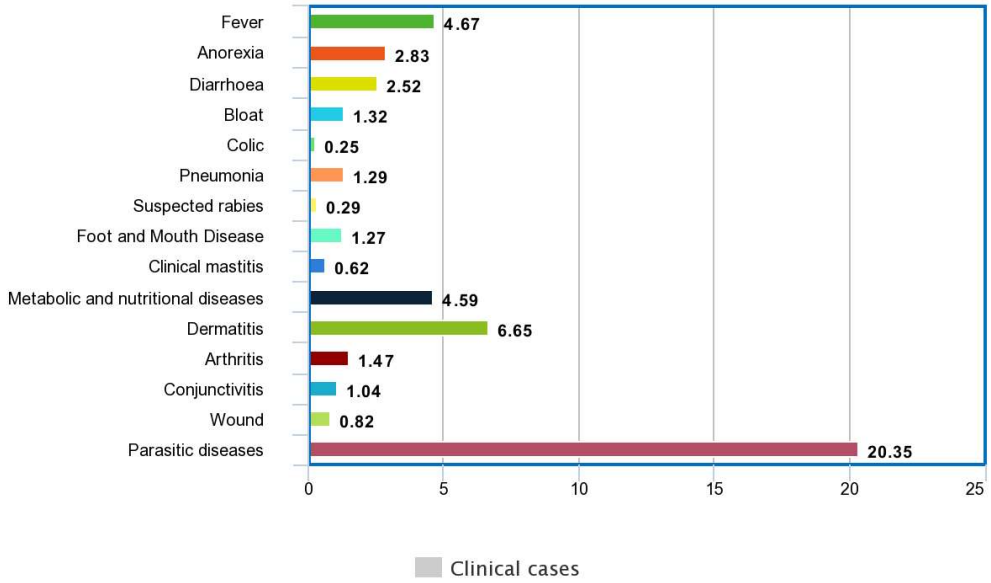

Figure 3: Participation status of the respondents in a seminar on rabies

Table 2. Proportionate prevalence of different parasitic diseases presented to Atpara Veterinary Hospital, Netrakona between 2007 and 2010

Name of parasitic diseases	No. of individual cases	% of total parasitic l cases (n = 1389)	% of total clinical cases (N = 6825)
Ascariasis	40	2.90 %	0.59 %
Fascioliasis	78	5.60 %	1.14 %
Coccidiosis	69	4.96 %	1.01 %
Stomach worm infestation	1112	80.05 %	16.29 %
Ectoparasitic infestation	90	6.48 %	1.31 %

Seasonal preferences is often could be noticed in the epidemiology study of individual parasitic disease. Unfortunately this was not very distinct in our study which might be because of the heterogeneity of parasitic agents (helminths, protozoa and arthropods) and each group of pathogens having diverse biology. Stomach worm infestation was highest throughout the year of all the clinical cases documented at the study hospital . Occurrence of fascioliasis, ascariasis, coccidiosis, ectoparasitic infections were also common throughout the year but at a lower proportion. Dey *et al*., (2020) reported 62.1% countrywide prevalence of gastrointestinal helminths comprising *Haemonchus*, *Trichostrongylus*, *Bunostomum* and *Oesophagostomum* in goats and identified rainy season as significantly associated with such infection. Rahman *et al*., (2017) found 63.2% prevalence for small ruminant GI parasites and highest prevalence in rainy season followed by winter and summer. As a whole, a year-round prevalence of parasitic infestation was evident from this investigation in the study area.

Conclusions

Majority of parasitic gastroenteritis, dermatitis and metabolic disorders were prevalent among the farm animals in the study area with year-round parasitic infestation. Older animals were more vulnerable than younger one. Knowledge generated from this study will facilitate the understanding of epizoootiological distribution of parasitic diseases at Atpara Upazila of Netrakona district and taking actions for sustatinable control and management of farm animal diseases. It could also be stated that retrospective study of hospital records might act as primer for clinicians who generate hypotheses to be tested prospectively for outcome research as well as the treatment, management of diseases.

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Conflict of interest

No conflict of interest exists.

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