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Full Length Research Paper

Analyzing the Seasonal Patterns of Farm Animal Diseases at Gondar University Veterinary Clinic (2007-2009)

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A retrospective study was conducted to determine temporal distribution of clinical diseases of farm animals presented to Gondar University Veterinary Clinic during the years 2007 to 2009. Of the total 1966 clinical cases, septicemia, parasitic cases, pneumonia, reproductive tract problems, metabolic disorders, wound, clinical mastitis and dermatitis were frequent cases and contributed 33.2, 22.4, 15.7, 5, 4.2, 4.1, 3 and 2.6% of the total cases, respectively. Highest and lowest number of cases were registered in the years 2009 (38.9%) and 2007 (27.8%), and during winter (27%) and spring (23.3%) seasons, respectively. Septicemia, parasitic cases/diseases, and pneumonia were the most frequent cases observed. The highest number of cases of septicemia, 208 of 653 (31.9%), was observed in summer, being peak in June. The highest number of parasitic (126 of 440) and pneumonia (117 of 312) cases was observed in winter, being peak in February. Occurrence of the common diseases follow relatively similar pattern of temporal distribution in sheep and cattle. Generally, lowest peaks of clinical diseases were observed during the months of November and December. The study indicated that occurrence of clinical cases had been affected by temporal factor. Therefore, animal owners and animal health service providers should give more emphasis for winter and summer months to prevent occurrence of clinical diseases in their animals in the study area.

Key words: Cattle, Gondar, parasite, pneumonia, septicemia, sheep.

INTRODUCTION

Emphasis of veterinary medicine had been on the treatment of individual animals with clearly identifiable diseases or defects. Currently, restricted attention is given to herd health and comprehensive preventive medicine which give proper consideration to both infectious and non-infectious diseases, and designed to increase production by preventing disease, rather than just dispensing traditional treatment to clinically sick animals (Thrusfield, 2005). However, in the developing countries like Ethiopia, the infectious diseases still cause considerable loss of animal life and production (Rashid and Shank, 1994; Thrusfield, 2005). In such countries, animal disease management is still practiced by treatment of individual animals.

Diagnosing a disease and provision of treatment and control measures for disease management involves

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physical examination and generation of a list of differential diagnoses; the critical part of which is clinical examination of individual animal or group of animals (Faccini, 2008). However, in addition to the clinical examination of individual or group of animals, epidemiological investigation may make a valuable contribution to the making of a diagnosis for a herd of animals affected with clinical disease (Thrusfield, 2005).

Prevalence and intensity of pathogenic infections are often seasonal and occur in many species and may be linked to changes in the host or to seasonal changes in the prevalence of the pathogen or vector (Nelson et al., 2002). In this regard, knowledge of temporal pattern of distribution of a disease in a population is important in suggesting the type of disease that is occurring and its possible causes. It also helps to relate the information to management or environmental changes (Radostits et al., 2007) and is an important step in planning and implementing effective control measures. It helps to understand the natural history of infectious diseases in different populations and to determine their importance and efficacy of control campaigns (Thrusfield, 2005). This can be determined by collecting and graphing of time of occurrence of clinical diseases (Radostits et al., 2007). However, spatial and temporal distribution of clinical diseases of farm animals was not known in and around Gondar. A study of temporal distribution of clinical diseases of farm animals was therefore carried out on farm animals presented to Gondar University Veterinary Clinic in the years 2007 to 2009, Ethiopia.

MATERIALS AND METHODS

Origin of study animals

The area where study animals were originated was Gondar town and its surroundings. This area has four seasons with sub-humid agro-climatic zone. Months of June to August are summer (rainy seasons), months of September to November are spring, months of December to January are winter (dry seasons) while months of March to May are autumn. The area has daily temperature of 22 to 30.7°C, and it receives an annual rainfall of 1172 mm. In the study area, there were 78,123 cattle, 25,067 sheep, 21,515 goats and 9,588 equines (horse, donkey and mules) (Community-supported agriculture (CSA), 2008).

Study subjects

Clinically sick farm animals' species including cattle, sheep, goats, horses and donkeys were the study subjects. In Gondar town, animals were kept in intensive and semi-intensive management system; fed with concentrates and hay; water available free throughout the day time. 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 Gondar, animals were kept in extensive management system, and allowed to graze native pastures. Animals trekked for watering once in a day. Crop residues were given for oxen and cows when there is scarcity of pasture to graze at the late dry season. However, supplementary feeding after work for oxen, for milking cows, before and after packing for equines and for fattening of sheep and goats was not uncommon. Most cattle were the indigenous zebu breeds of both sexes kept mainly for breeding for the purpose of replacing draught oxen.

Study design

It was a retrospective study conducted on 1966 clinical cases of farm animals presented to University of Gondar Veterinary Clinic during the years 2007 to 2009. Clinical cases of bloat, clinical mastitis, colic, diarrhea, hernia, conjunctivitis, septicemia and tumor were taken as separate problems. Other cases were grouped into the following ten major categories. Cases of hematoma and omphalitis were categorized under cellulites. Orf, dermatophilosis, dermatophytosis and otitis categorized as cases of dermatitis. Cases associated with consumption of foreign materials like eating of polyethylene plastic materials, cases associated with traumatic reticuloperitonitis and esophageal obstruction was categorized into foreign body problems. Cases which discharge pus without intervention or following paracentesis or minor surgery like localized purulent lesions, actinobacillosis and actinomycosis were considered localized abscess. Cases of hypocalcemia, acidosis, simple indigestion and pregnancy toxemia were grouped as metabolic disturbances. Cases of tetanus, coenurosis and cowdriosis were categorized into cases of nervous disturbances. Internal parasites including strongyles, lungworms, trypanosomiasis, nasal bot, babesiosis, fasciolosis, ascariasis and coccidiosis and external parasites including ticks and mange mites were grouped into problems associated with parasites. Aspiration pneumonia, *Pasteurella* pneumonia, verminous pneumonia, contagious caprine pleuro-pneumonia (CCPP), contagious bovine pleuropneumonia (CBPP) and other pneumonia associated with unpredictable causes were categorized into problems of pneumonia. Cases due to metritis, abortion, retained fetal membrane, vaginal prolaps, cystitis, uterine torsion, pyometra, dystocia and orchitis were categorized into problems of reproductive tract. Cases of saddle sour, yoke sore, mechanical injury and any wound produced due to any trauma were categorized into cases of wound.

Data management and analysis

The data were entered and managed in MS Excel work sheet. Proportion of different farm animals' health problems was expressed as percentage by dividing total number of animals positive to a specific health problem to the total number of animals which showed clinical disease

RESULTS

Of the total 1,966 animal health cases presented to University of Gondar Veterinary clinic in the three years period, the highest 53% (1,041 of 1,966) were cattle followed by sheep (38%) and equine (7.4%) while the lowest 1.7% (33 of 1,041) were goats. When the distribution of clinical cases was observed during the years 2007 to 2009, the highest number of cases was registered in the year 2009 (38.9%) while lowest was

Table 1. Number of clinical cases diagnosed during the years 2007 to 2009 in University of Gondar Veterinary clinic.

Type of cases	Total no. of cases (%)	Number of cases in the three years period		
		2007 (%)	2008 (%)	2009 (%)
Septicemia	653(33.2)	197 (30.2)	253 (38.7)	203 (31.1)
Parasitic cases	440(22.4)	159 (36.1)	122 (27.7)	159 (36.1)
Pneumonia	312(15.9)	88(28.2)	93 (29.8)	131 (42)
Reproductive tract problems	98 (5)	16(16.3)	13 (13.3)	69 (70.4)
Metabolic disorders	83(4.2)	16(19.3)	22 (26.5)	45 (54.2)
Wound	81(4.1)	14(17.3)	28 (34.6)	39 (48.1)
Clinical mastitis	60 (3)	12 (20)	19 (31.7)	29 (48.3)
Dermatitis	52(2.6)	13 (25)	22 (42.3)	17 (32.7)
Localized abscess	48(2.4)	13 (27)	20 (41.7)	15 (31.2)
Diarrhea	43(2.2)	8 (18.6)	24 (55.8)	11 (25.6)
Foreign body	27(1.4)	5 (18.5)	6 (22.2)	16 (59.3)
Tumor	20 (1)	-	10 (50)	10 (50)
Bloat	13(0.7)	1(1.9)	9 (69.2)	3 (23.1)
Conjunctivitis	12(0.6)	-	5 (41.7)	7 (58.3)
Colic	7 (0.4)	1 (14.3)	4 (57.1)	2 (28.6)
Hernia	7 (0.4)	-	3 (42.9)	4 (57.1)
Nerveous disturbances	7 (0.4)	3 (42.9)	2 (28.6)	2 (28.6)
Cellulitis	3 (0.2)	-	-	3 (100)
Total	1966	546 (27.8)	655 (33.3)	765 (38.9)

registered in 2007 (27.8%) (Table 1).

When pattern of the most frequent 10 cases was considered, highest number of cases of septicemia, 208 of 653 (31.9%) was observed in winter seasons while the lowest (142 of 653) was observed in summer. Highest number of parasitic cases (126 of 440) and pneumonia cases (117 of 312) was observed in summer while the lowest parasitic cases (92 of 440) and pneumonia cases (47 of 312) was observed in winter seasons of the study period (Figure 1).

Peak septicemia was observed during the months of June and March while the lowest number of cases of septicemia was observed in December. The highest parasitic case was observed in September while the lowest was observed during August. The highest case of pneumonia was observed during the months of February while the lowest was observed during the months of July, August and September. Generally, lowest peaks of clinical diseases were observed during the months of November and December while relatively highest number of clinical cases was observed during the months of June, February and March (Figure 2).

The number of sheep with clinical cases of septicemia was peak during August while that of parasitic cases and pneumonia was highest during the months of October and February, respectively. The lowest number of cases of septicemia was observed during July while that of parasitic cases and pneumonic cases was observed during the months of June and July, respectively (Figure 3). The number of cattle with clinical cases of septicemia was peak during the months of June and March while the lowest number of cases was recorded during September. The number of cattle with parasitic cases was highest during September while the lowest number of cases due to parasites was observed during August. Highest number of cattle with cases of pneumonia was observed during June while the lowest was recorded during September (Figure 4).

DISCUSSION

Highest number of cases was registered in the year 2009 compared to the other two years which may be associated with changes in environmental factors like rain, temperature, and humidity which might affect animal disease occurrence among the study years or increase in the number of clients in the years 2008 and 2009, as the veterinary clinic was recently established. However, when the number of animals for each of clinical problems was compared among the study years, almost similar pattern of occurrence was observed. Number of cases with septicemia was highest in each of the study years followed by parasitic cases, pneumonia, reproductive

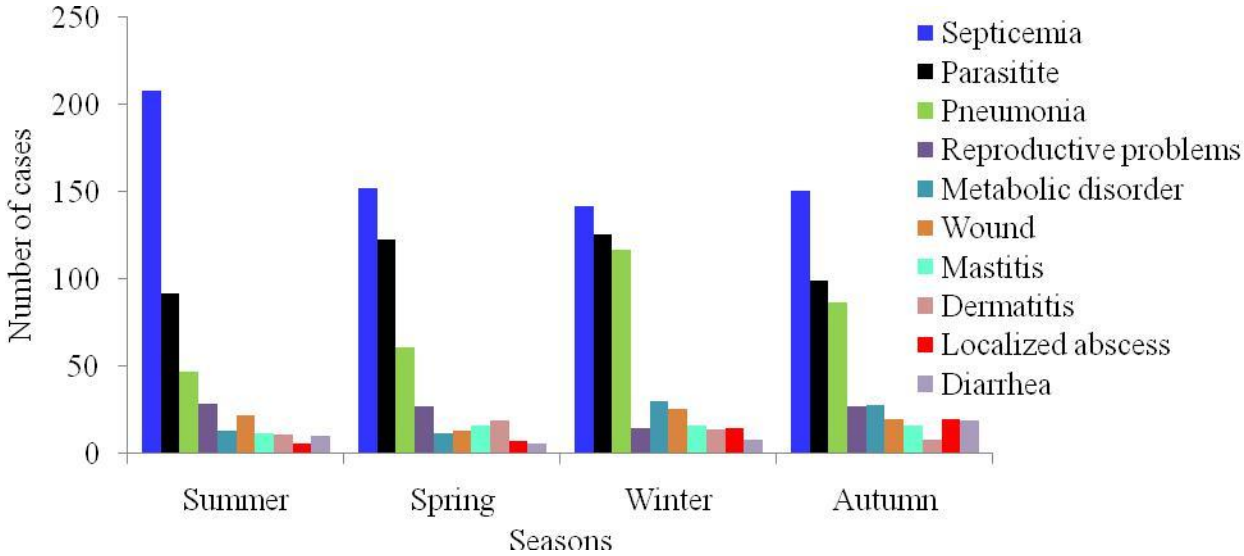

Figure 1. Seasonal occurrence of most common clinical cases of farm animals presented to Gondar University Veterinary clinic during the years 2007 to 2009.

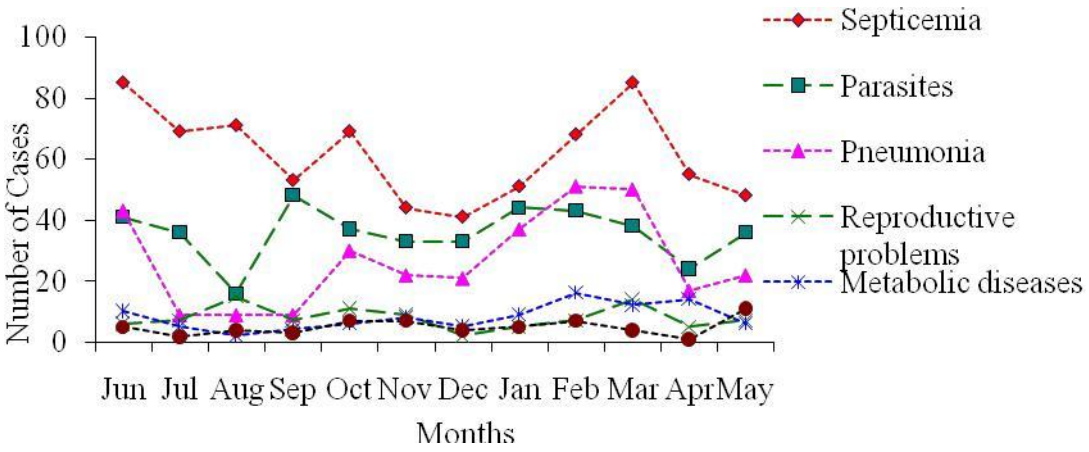

Figure 2. Monthly dynamics of major clinical cases of farm animals presented to Gondar University Veterinary clinic during the years 2007 to 2009.

tract problems and metabolic disorders. Occurrence of highest number of cases of septicemia observed in summer and especially during the month of June can be justified from the point of high level of environmental contamination as the result of flooding following the start of rainy season which disseminates infectious agents from cadavers and other reservoirs. Human activity like excavation of soil for cultivation during these times can also expose and activate latent organisms and facilitate disease transmission (Radostits et al., 2007). Similarly, highest number of septicemia during March could be associated with high level of exposure to infectious agents. Animals graze close to the ground as a result of scarce grazing and have higher chance to acquire infectious agents, and short rain might favor multiplication and transmission of infectious agents.

Highest number of parasitic cases was observed during spring and winter. The result in this study coincides with the previous works of Alemu et al. (2006) and Regassa et al. (2010) who reported highest prevalence of small ruminant lungworms in November (spring) and February (winter). The difference might be associated with variation in seasonal factors as the epidemiology of gastrointestinal nematode infections is influenced by

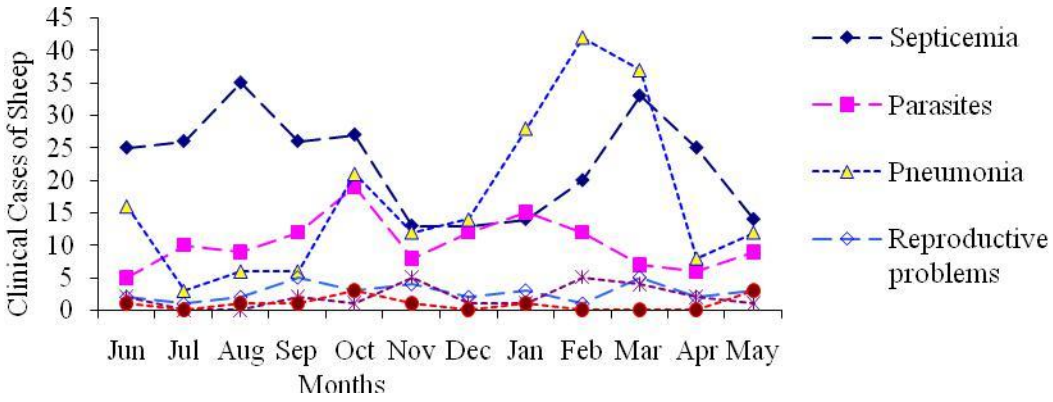

Figure 3. Monthly dynamics of major clinical cases in sheep presented to University of Gondar Veterinary clinic during the years 2007 to 2009.

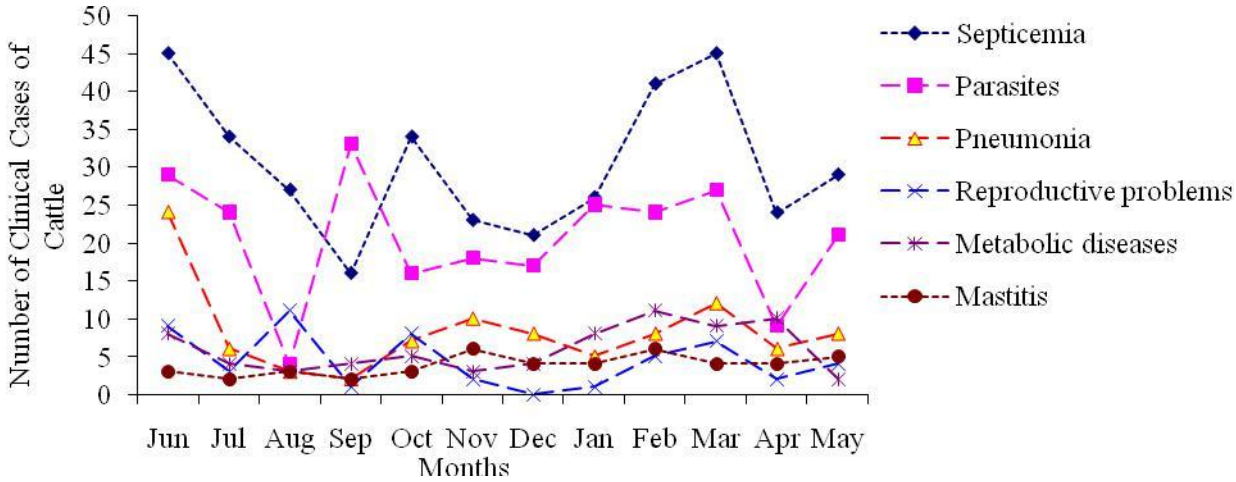

Figure 4. Monthly dynamics of major clinical cases in cattle presented to University of Gondar Veterinary clinic during the years 2007 to 2009.

climatic factors (particularly rainfall and temperature), management systems used for the animals, and parasite factors including intermediate hosts all determine the epidemiology of the parasite as well (Kusiluka and Kambarage, 2006). According to Taylor and Andrews (2003), parasitic gastroenteritis normally occurs when calves or non-immune older cattle are grazed on pastures on which a large number of infective larvae are present.

The highest number of cases of pneumonia was observed in winter, especially during February. According to Radostits and his colleagues, deprived of feed and water for prolonged periods, marked changes in weather, and other factors that impair innate or adaptive resistance increase the animal's susceptibility to pneumonia (Radostits et al., 2007). In such cases, most of the bacteria which are normally resident in the upper respiratory tract have the ability to establish themselves in the lower respiratory tract (lung) and cause disease when the defense mechanism of the host is affected (Lopez, 1995; Health and Age, 2005). Therefore, the highest number of pneumonia is associated with change in the factors that determine animals' resistance to infection.

Occurrence of the common cases of clinical diseases follow relatively similar pattern of temporal distribution in sheep and cattle. Generally, the relative difference in the temporal distribution of the number of clinical cases might be associated with changes in environmental factors directly or indirectly affecting animals' immunity and/or factors which favor multiplication, survival and transmission of disease causing agents. Some non-infectious diseases may also show seasonal trends

(Thrusfield, 2005).

Conclusion

When the most common clinical cases were considered, highest number of cases of septicemia, parasitic cases, and cases of pneumonia was observed in summer, spring and winter seasons especially in the months of June, September, and February, respectively. Therefore, animal owners and animal health workers should give more attention during this time of the year for optimal prevention and control of clinical diseases of farm animals in the study area.

REFERENCES

Alemu S, Gelaye EL, Ayelet G, Zeleke A (2006). Study on small ruminant lungworms in north-eastern Ethiopia. Vet. Parasitol. 142:330-335.

CSA (2008). North Gondar zone finance and economic development department annual statistical bulletin, pp. 10-42.

Faccini FP (2008). An Epidemiological approach to Diagnostic Process - Medstudents – Epidemiology. Meds (1). Htm 3/16/2008 11:48:14 Am.

Kusiluka L, Kambarage D (2006). Diseases of Small Ruminants, A Handbook, Common Diseases of Sheep and Goats in Sub-Saharan Africa. P 8-11.

Lopez A (1995). Respiratory System. In: Carlton WW, McGavin MD (eds): Thomson's Special Veterinary Pathology. 2nd Ed., Zachary Eds. Mosby. pp. 116-174.

Nelson JR, Demas EG, Klein LS, Kriegsfeld JL (2002). Seasonal patterns of stress, immune function, and disease. 1st Ed. Cambridge University Press, Cambridge, UK.

Radostits OM, Gay CC, Hinchcliff KW, Constable PD (2007). Veterinary Medicine, A Textbook of the Diseases of Cattle, Horses, Sheep, Pigs, and Goats. 10th Ed. London: Saunders Elsevier. Pp. 119-1966.

Rashid M, Shank R (1994). United Nations Development Programme Emergencies Unit for Ethiopia: Technical Report: Rough Guide to Animal Diseases in Ethiopia.

Regassa A, Toyeb M, Abebe R, Megersa B, Mekibib M, Mekuria S, Debela E, Abunna F (2010). Lungworm infection in small ruminants: Prevalence and associated risk factors in Dessie and Kombolcha districts, northeastern Ethiopia. Vet. Parasitol. 169:144–148.

Taylor MS, Andrews HA (2003). Endoparasites: In Andrews HA, Blowey WR, Boyd H, Eddy GR (ed) Bovine Medicine Diseases and Husbandry of Cattle. 2nd Ed. Blackwell Science, UK. p. 268.

Thrusfield M (2005). Veterinary Epidemiology. 3rd Ed. Oxford: Blackwell Science Ltd. pp. 228-246.