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CALF DISEASES AT JHENAIDAH DISTRICT, BANGLADESH: EPIDEMIOLOGICAL STATUS WITH RELATION TO AGE AND SEASON

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ABSTRACT

In Bangladesh calves are affected by several types of diseases and most of them are parasitic, infectious, metabolic or nutritional, surgical affection etc. causing severe economic losses in every year. The study was conducted to investigate the epidemiological status of calves' diseases with relation to age and seasonal variation at Jhenaidah district, Bangladesh. A total of 12525 clinical cases were registered in all 6 Upazila of Jhenaidah district for the clinical diagnosis and therapeutic purposes during a period of two years, which were analyzed to evaluate the prevalence of clinical diseases in calves. Each of the clinical case was diagnosed on the basis of history, general examination, physical examination and clinical findings. Among the recorded cases the highest prevalence of clinical cases in calves were found to be round worm infestation (14.80%), and followed in descending order by non-specific diarrhoea (9.20%), liver fluke infestation (8.34%), anorexia (7.95%), lice infestation (6.66%), debility (6.42%), wounds (4.68%), tick infestation (3.93%), tape worm infestation (3.54%), non-specific fever & navel ill (3.42%), coccidiosis (3.35%), conjunctivitis (3.16%), FMD (2.83%), pneumonia (2.49%), allergy/skin disease (2.30%), coldness (2.06%), tympany/bloat (1.71%), calf-scour (1.61%) etc. Among the general clinical disorder, the highest prevalence of clinical cases was non-specific diarrhoea (9.20%), among parasitic disease the highest prevalence was round worm infestation (14.80%), among infectious disease the highest prevalence was coccidiosis (3.35%), among surgical affection the highest prevalence was wound (4.68%). The influence of age and season on the occurrence of these diseases was considered. Immuno prophylaxis and hygienic management should be introduced to curtail the prevalence of calf diseases and disorders. So more epidemiological and intensive laboratory study should be needed to confirm the etiology, prevention and control measures of the diseases and disorders in cattle at study area.

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INTRODUCTION

Bangladesh is one of the most densely populated country in the world with an estimated 1,265 people/km² (BBS, 2022). Livestock density is also highest in the world with an estimated 145 large ruminants/km² compared with 90 for India (BARC Bangladesh, 2010). It is estimated that 24.70 million cattle are present in Bangladesh (Livestock Economy at a glance 2021-22). About 20% of the human population is directly and 50% is partially depended on the livestock sector (Bangladesh Economic Review, 2009, Livestock Economy at a glance, 2021-22). In 2021-22 contribution of Livestock in GDP is 1.90%, GDP growth rate of Livestock is 3.10%, share of Livestock in Agricultural GDP 16.52% (Livestock Economy at a glance, 2021-22).

Among all of livestock population, cattle are one of the most important components of rural agricultural farming system and it has been playing an important role in economy by providing food, draft power, transport, hides, bones, bio-gas etc. The future source of cattle are the healthy calves of present day, which are mostly under-nourished and emaciated, frequently affected with several types' diseases due to poor management practices, socio-economic and geo-climatic conditions of Bangladesh. There are various constrains for the development of healthy cattle, of which calves' diseases and subsequent calves mortality each year are the most important factor (Debnath et al., 1990). There are some clinical cattle case records from Bangladesh Agricultural University Veterinary Clinic (Samad et al., 2002); Patuakhali Science and Technology University Veterinary Clinic (Rahman et al., 2012); Veterinary Hospital of Chittagong district (Badruzzman et al., 2015), where similar report on calves' diseases is moderately limited at Jhenaidah district, Bangladesh. The present study was undertaken to investigate the prevalence of calves diseases considering age and seasons at Jhenaidah district, Bangladesh. Findings of this study will give a clear concept about the distribution of calves' diseases at Jhenaidah region which may assists researcher or veterinary clinicians to design and implement priority-based research on specific calves' diseases and to take efficient control strategies against those diseases.

METHODOLOGY

The diseases were diagnosed by general physical examination of animals, clinical signs, gross pathology (Jones et al., 1996; Khan, 2000) and laboratory procedures on the basis of owner's statement, general physical examination, case history, clinical signs, clinical examination by Rosenberger (1979) and Samad (1988b). General physical examination was performed by observation of animal's body condition, behavior, posture, gait, locomotive disturbance, pulse, respiration, temperature, defecation etc. (Kelly 1979 and Samad 1988b). Clinical examination was performed by using the procedure of palpation, percussion, auscultation etc. Some fecal and blood samples were collected from suspected cases and examined under microscope for identification of helminth parasite and blood protozoa.

The hemoprotozoan infestation was confirmed by blood smears prepared and examined under microscope after Giemsa's staining (Hendrix and Robinson, 2006). The calves were categorized based on their age as 0-3 month's group, 3-6 months groups and 6-12 months group. Diagnosed diseases were categorized as general clinical disorders, parasitic diseases, infectious diseases, nutritional or deficiency diseases, inherited diseases and surgical affections. On the basis of climatic conditions, the year was divided into four seasons. Summer season was considered from March to May, rainy season from June to August, autumn from September to November and winter from December to February.

RESULTS AND DISCUSSION

The incidences of various clinical cases in calves of all categories were shown in Table 1 and seasonal incidences of various clinical cases in calves were shown in Table 2. The incidence round worm infestation was found to be highest (14.80%), and followed in descending order by non-specific diarrhoea (9.20%), liver fluke infestation (8.34%), anorexia (7.95%), lice infestation (6.66%), debility (6.42%), wounds (4.68%), tick infestation (3.93%), tape worm infestation (3.54%), non-specific fever & naval ill (3.42%), coccidiosis (3.35%), conjunctivitis (3.16%), FMD (2.83%), pneumonia (2.49%), allergy/skin disease (2.30%), coldness (2.06%), tympany/bloat (1.71%), calf-scour (1.61%) etc. Among the general clinical disorder, the highest prevalence of clinical cases was non-specific diarrhoea (9.20%), among parasitic disease the highest prevalence was round worm infestation (14.80%), among infectious disease the highest prevalence was coccidiosis (3.35%), among surgical affection the highest prevalence was wound (4.68%).

General Clinical Disorder

Anorexia

Anorexia recorded in 7.95% calves, where the incidence was slightly high in 6-12 months age group and the incidence was in 4.12% calves (Table 1). The incidence of anorexia recorded little more during summer in 2.20% calves and at winter in 2.44% calves than rainy season and autumn (Table 2).

Non-specific diarrhoea

Among the general clinical disorder, the highest incidence was diarrhoea, which recorded in 9.20% calves, where the incidence was slightly high in 6-12 months age group and the incidence was in 4.22% calves (Table 1). The incidence of diarrhoea recorded little high during autumn in 2.52% calves and at winter in 2.90% calves (Table 2).

Constipation

Constipation recorded in 1.56% calves. The highest incidence was in 0-3 months age group and the incidence was in 0.85% calves (Table 1). There was no observed seasonal influence (Table 2).

Tympany/bloat

Tympany/bloat recorded in the respective record was 1.71% in calves (Table 1). The incidence of constipation recorded little high during rainy season in 0.51% calves and at autumn in 0.54% calves (Table 2).

Debility

The important general clinical disorder debility recorded in 6.42% in calves. The incidence was slightly high in 6-12 months age group and the incidence was in 3.43% calves (Table 1). There was no observed seasonal influence (Table 2).

Non-specific Fever

Clinical examination revealed that 3.42% calves had non-specific fever and the incidence recorded little high in 6-12 months age group and the incidence was in 1.65% calves (Table 1). The incidence of non-specific fever recorded little high during rainy season in 0.95% calves and in winter in 1.02% calves (Table 2).

Allergy/skin lesion

Allergy/skin lesion detected in 2.30% calves and the incidence was little high in 6-12 months age group which was in 1.06% calves (table 1). The seasonal influence was very minimum (Table 2).

Burn

It was observed that burn recorded in 0.48% calves' fever and the incidence was little high in 0-3 months age group and the incidence was in 0.29% calves (Table 1). The highest incidence of burn recorded during winter season in 0.26% calves (Table 2).

Aspiration pneumonia

Aspiration pneumonia recorded in 0.43% calves and the incidence was highest in 0-3 months age group which was in 0.29% calves (Table 1). The seasonal influence was very minimum (Table 2).

Coldness

An important general disorder for calves was coldness, which recorded in 2.06% calves and the incidence was little high in 0-3 months age group which was in 0.81% calves (table 1). The highest incidence of coldness recorded during winter season in 1.23% calves (Table 2).

*Dog/fox bite***

Mechanical injury dog/fox bite recorded in 0.86% calves and the incidence was little high in 0-3 months age group which was in 0.43% calves (table 1). The biting incidence was highest during autumn in 0.54% calves due to the mating season of dog (Table 2).

Table 1. Age wise incidence of general clinical diseases.

Diseases	Calf (0-3 months)	Calf (3-6 months)	Calf (6-12months)	Total Incidence	Proportional Incidence (%)
General Clinical Disorder					
Anorexia	192 (1.53%)	288 (2.30%)	516 (4.12%)	996	7.95
Non-specific diarrhoea	270 (2.16%)	354 (2.83%)	528 (4.22%)	1152	9.20
Constipation	106 (0.85%)	54 (0.43%)	36 (0.29%)	196	1.56
Tympany/bloat	52 (0.46%)	64 (0.54%)	98 (0.68%)	214	1.71
Debility	156 (1.25%)	218 (1.74%)	430 (3.43%)	804	6.42
Non-specific Fever	108 (0.86%)	114 (0.91%)	206 (1.65%)	428	3.42
Allergy/Skin Lesion	64 (0.51%)	90 (0.72%)	134 (1.06%)	288	2.30
Burn	36 (0.29%)	18 (0.14%)	06 (0.05%)	60	0.48
Aspiration Pneumonia	36 (0.29%)	04 (0.03%)	14 (0.11%)	54	0.43
Coldness	102 (0.81%)	94 (0.75%)	62 (0.50%)	258	2.06
Dog/fox bite	54 (0.43%)	30 (0.24%)	24 (0.19%)	108	0.86
Parasitic Diseases					
Lice Infestation	-	192 (1.53%)	642 (5.13%)	834	6.66
Tick Infestation	-	48 (0.38)	444 (3.55%)	492	3.93
Liver Fluke	-	-	1044 (8.34%)	1044	8.34
Round Worm	348 (2.78%)	552 (4.41)	954 (7.62)	1854	14.80
Tape Worm	204 (1.63%)	184 (1.47%)	56 (0.45%)	444	3.54
Coccidiosis	203 (1.62%)	136 (1.09%)	80 (0.64%)	419	3.35
Babesiosis	-	-	68 (0.54%)	68	0.54
Infectious Diseases					
Black Quarter	-	-	13 (0.10%)	13	0.10
Tetanus	26 (0.21)	12 (0.09%)	-	38	0.30
Pneumonia	192 (1.53%)	84 (0.67%)	36 (0.29%)	312	2.49
Calf scour	202 (1.61%)	-	-	202	1.61
Conjunctivitis	52 (0.42%)	128 (1.02%)	216 (1.72%)	396	3.16
FMD	28 (0.22%)	132 (1.05%)	194 (1.55%)	354	2.83
Rabies	-	05 (0.04%)	18 (0.14%)	23	0.18
Nutritional/Deficiency Disease					
Hypomagnesemia	54 (0.04%)	-	-	54	0.43
Hypocalcemia	42 (0.07%)	-	-	42	0.34
Ricket	05 (0.22%)	-	-	05	0.04
Inheritance Disease					
Congenital Hydrocephalus	09 (0.07%)	-	-	09	0.07
Tendon Contracture	27 (0.22%)	-	-	27	0.22
Freemartinism	05 (0.04%)	-	-	05	0.04
Surgical Affection					
Wound	245 (1.96)	133 (1.06%)	208 (1.66)	586	4.68
Abscess	12 (0.10%)	23 (0.18%)	63 (0.50)	98	0.78
Navel Ill	428 (3.42%)	-	-	428	3.42
Umbilical Hernia	102 (0.81%)	-	-	102	0.81
Atresia Anai	38 (0.31%)	-	-	38	0.31
Fracture/Dislocation	48 (0.38%)	18 (0.14%)	14 (0.11%)	80	0.64
Total				12525	100.00

Parasitic Diseases

*Lice Infestation***

The incidence of lice infestation during two years study at Jhenaidah district was in 6.66% calves and the incidence was highest in 6-12 months age group which was in 5.13% calves. No incidence recorded in 0-3 months age group (Table 1). The incidence of lice infestation recorded little high during summer season in 2.04% calves and in winter in 1.93% calves (Table 2).

*Tick Infestation***

Tick infestation recorded in 3.93% calves. The highest incidence was in 6-12 months age group which was in 3.55% calves. No incidence was recorded in 0-3- and 3-6-months age group (Table 1). The incidence of tick infestation recorded little high during summer season in 1.30% calves (Table 2).

*Liver Fluke***

One of the most important clinical cases in Bangladesh is liver fluke infestation, which recorded in 8.34% calves. The highest clinical case recorded in 6-12 months age group which was in 3.55% calves. No incidence was recorded in 0-3 months age group (Table 1). Clinical manifestation of liver fluke had seasonal influence, which was high during autumn in 2.25% calves and at winter in 2.73 % calves (Table 2). To determine the liver fluke infestation fecal examination and clinical findings was in considered.

*Round Worm ***

Among all diseases, the incidence of round worm infestation was highest and recorded in 14.80% calves. The highest incidence was in 6-12 months age group which was in 7.62% calves. (Table 1). The incidence of round worm infestation recorded little high during summer season in 4.76% calves and at rainy season in 4.06% calves (Table 2). To determine the round worm infestation fecal examination was done randomly.

*Tape Worm***

Tape Worm recorded in 3.54% calves and the incidence was highest in 0-3 months age group which was in 1.63% calves, then 3-6 months age group 1.47% (Table 1). The study indicates that there was an age influence. No case recorded in adults. The seasonal influence was very minimum (Table 2).

Infectious Diseases

Black quarter

The important bacterial disease for young cattle black quarter recorded in 0.10% calves. The incidence was only recorded in 6-12 months age group (Table 1). The highest incidence of black quarter recorded during rainy season in 0.06% calves (Table 2).

Tetanus

Tetanus recorded in 0.30% calves. The incidence was highest in 0-3 month's age group which was in 0.21% calves, then 3-6 months age group 0.09%. No incidence was recorded in 6-12 months age group (Table 1). The highest incidence of tetanus recorded during winter season in 0.18% calves (Table 2).

Pneumonia

Pneumonia recorded in 2.49% calves. The incidence was highest in 0-3 month's age group which was in 1.53% calves (Table 1). The highest incidence of Pneumonia recorded during winter season in 1.34% calves (Table 2).

Calf scour

Calf scour recorded in 1.61% calves and the incidence was recorded only in 0-3 months age group calves (Table 1). The seasonal influence was very minimum (Table 2).

Conjunctivitis

Conjunctivitis recorded in 3.16% calves. The incidence was highest in 6-12 months age group which was in 1.72% calves (Table 1). The incidence of Conjunctivitis recorded little high during summer season in 0.94% calves and at winter season in 0.86% calves (Table 2).

Table 2. Seasonal incidence of various clinical diseases in calves at Jhenaidah District.

Diseases	Summer (%)	Rainy (%)	Autumn (%)	Winter (%)	Total Incidence	Proportional Incidence
General Clinical Disorder						
Anorexia	275 (2.20%)	214 (1.71%)	201 (1.60%)	306 (2.44%)	996	7.95
Diarrhoea	208 (1.66%)	265 (2.12%)	316 (2.52%)	363 (2.90%)	1152	9.20
Constipation	63 (0.51%)	45 (0.36%)	42 (0.33%)	46 (0.36%)	196	1.56
Tympany/bloat	38 (0.30%)	64 (0.51%)	68 (0.54%)	44 (0.35%)	214	1.71
Debility	165 (1.32%)	188 (1.50%)	208 (1.66%)	243 (1.94%)	804	6.42
Non-specific Fever	74 (0.59%)	119 (0.95%)	108 (0.86%)	127 (1.02%)	428	3.42
Allergy/Skin Lesion	63 (0.50%)	75 (0.60%)	68 (0.54%)	82 (0.66%)	288	2.30
Burn	18 (0.14%)	06 (0.05%)	03 (0.02%)	33 (0.26%)	60	0.48
Aspiration Pneumonia	15 (0.12%)	10 (0.08%)	08 (0.06%)	21 (0.17%)	54	0.43
Coldness	-	43 (0.34%)	61 (0.49%)	154 (1.23%)	258	2.06
Dog/fox bite	-	32 (0.26%)	68 (0.54%)	08 (0.06%)	108	0.86
Parasitic Diseases						
Lice Infestation	256 (2.04%)	150 (1.20%)	186 (1.49%)	242 (1.93%)	834	6.66
Tick Infestation	163 (1.30%)	124 (0.99%)	108 (0.86%)	97 (0.78%)	492	3.93
Liver Fluke	176 (1.41%)	207 (1.65%)	319 (2.55%)	342 (2.73%)	1044	8.34
Round Worm	596 (4.76%)	508 (4.06%)	375 (2.99%)	375 (2.99%)	1854	14.80
Tape Worm	136 (1.09%)	114 (0.91%)	102 (0.81%)	92 (0.73%)	444	3.54
Infectious Diseases						
Black Quarter	03 (0.02%)	08 (0.06%)	02 (0.02%)	-	13	0.10
Tetanus	08 (0.06%)	03 (0.02%)	05 (0.04%)	22 (0.18%)	38	0.30
Pneumonia	-	68 (0.54%)	76 (0.61%)	168 (1.34%)	312	2.49
Calf Scour	42 (0.34%)	53 (0.42%)	58 (0.46%)	49 (0.39%)	202	1.61
Conjunctivitis	118 (0.94%)	88 (0.70%)	82 (0.66%)	108 (0.86%)	396	3.16
FMD	32 (0.26%)	78 (0.62%)	108 (0.86%)	136 (1.09%)	354	2.83
Rabies	02 (0.02%)	01 (0.01%)	14 (0.11%)	06 (0.04%)	23	0.18
Coccidiosis	89 (0.71%)	93 (0.74%)	109 (0.87%)	128 (1.02%)	419	3.35
Babesiosis	29 (0.23%)	21 (0.17%)	15 (0.12%)	03 (0.02%)	68	0.54
Nutritional/Deficiency Disease						
Hypomagnesemia	12 (0.10%)	09 (0.07%)	10 (0.09%)	23 (0.18%)	54	0.43
Hypocalcemia	12 (0.10%)	08 (0.06%)	04 (0.03%)	18 (0.14%)	42	0.34
Ricket	-	-	02 (0.02%)	03 (0.02%)	05	0.04
Inheritance Disease						
Congenital Hydrocephalus	01 (0.01%)	02 (0.02%)	01 (0.01%)	05 (0.03%)	09	0.07
Tendon Contracture	02 (0.02%)	07 (0.06%)	05 (0.03%)	13 (0.10%)	27	0.22
Freemartinism	-	02 (0.02%)	-	03 (0.02%)	05	0.04
Surgical Affection						
Wound	152 (1.21%)	168 (1.34%)	132 (1.05%)	134 (1.07%)	586	4.68
Abscess	32 (0.26%)	21 (0.17%)	19 (0.15%)	26 (0.21%)	98	0.78
Navel Ill	120 (0.96%)	131 (1.05%)	97 (0.77%)	80 (0.64%)	428	3.42
Umbilical Hernia	26 (0.21%)	12 (0.09%)	22 (0.17%)	42 (0.34%)	102	0.81
Atresia Anai	10 (0.08%)	06 (0.05%)	08 (0.06%)	14 (0.11%)	38	0.31
Fracture/Dislocation	28 (0.22%)	23 (0.18%)	17 (0.14%)	12 (0.10%)	80	0.64
Total	2964 (23.66%)	2966 (23.68%)	3027 (24.17%)	3568 (28.49%)	12525	100.00

Foot and Mouth Disease **

The most important viral disease in Bangladesh for cattle is FMD, which is a contagious disease for ruminants. The case recorded in 2.83% calves. The clinical manifestation of FMD was recorded little high in 6-12 months age group which was in 1.55% calves (Table 1). The incidence of FMD recorded highest during winter season in 1.09% calves and at autumn in 0.86% calves (Table 2).

Rabies **

Rabies was recorded only in 0.18% calves. No case recorded in 0-3 month's age group (Table 1). The incidence of rabies recorded highest during autumn in 0.11% calves (Table 2).

Coccidiosis

The important protozoan disease coccidiosis, recorded in 3.35% calves. The incidence was highest in 0-3 month's age group which was in 1.62% calves (Table 1). The incidence of coccidiosis recorded highest during winter season in 1.02% calves (Table 2).

Babesiosis

Important blood protozoan disease, babesiosis recorded in 0.54% calves. The incidence only recorded in 6-12 months age group calves (Table 1). The incidence of babesiosis recorded little higher during summer season in 1.23% calves (Table 2).

Nutritional/Deficiency Diseases

Hypomagnesemia

Hypomagnesemia was recorded in 0.43% calves and incidence was only in 0-3 months age group calves (Table 1). The seasonal influence was very minimum (Table 2).

Hypocalcemia

Hypocalcemia was recorded in 0.34% calves and incidence was only in 0-3 months age group calves (Table 1). The seasonal influence was very minimum (Table 2).

Ricket

During three years investigation the incidence of ricket recorded only in 5 calves, 0.04% calves (Table 1). The incidence of ricket detected during autumn in 2 calves and at winter in 3 calves (table 2).

Inheritance Diseases

Congenital Hydrocephalus

Congenital Hydrocephalus recorded in 0.07% calves during parturition (Table 1). The incidence noticed in the respective veterinary hospital due to dystocia.

Tendon contracture

Tendon contracture recorded in 0.22% calves after parturition (Table 1). The incidence noticed in the respective veterinary hospital for surgical operation.

Freemartism

Freemartism recorded in 0.04% calves (Table 1). The incidence if freemartism noticed in the respective veterinary hospital due to repeat breeding.

Surgical Affections

Wound

The most common surgical affection wounds recorded in 4.68% calves at the clinical investigation. The incidence was little high in 0-3 months age group calves, 1.96% and in 3-6 months age group calves 1.06% (Table 1). The incidence of wound recorded little high during summer in 1.21% calves and at rainy season in 1.34% calves (Table 2).

Abscess

The operative case abscess recorded in 0.78% calves. The incidence was little high in 6-12 months age group calves, which was in 0.50% calves (Table 1). There was no observed seasonal influence (Table 2).

Navel Ill **

Navel Ill recorded in 3.42% calves and the incidence was only limited in 0-3 months age group calves (Table 1). The incidence of navel ill recorded little high during summer in 0.96% calves and at rainy season in 1.05% calves (Table 2).

Umbilical hernia

Another important operative case umbilical hernia recorded in 0.81% calves and the incidence was only limited in 0-3 month's age group calves (Table 1). The incidence of umbilical hernia recorded little high during winter in 0.34% calves (Table 2).

Atresia anai

During the investigation, atresia anai recorded in 0.31% calves which was only limited in 0-3 months age group calves (Table 1). There was no observed seasonal influence (Table 2).

Fracture/Dislocation

Fracture was recorded in 0.64% calves. The incidence was little high in 0-3 month's age group calves, which was in 0.38% calves (Table 1). The incidence was little high in 6-12 months age group calves, which was in 0.50% calves

CONCLUSION

The study showed that general digestive disorders, parasitic diseases, infectious diseases and also nutritional or metabolic diseases, inherited diseases and surgical affections of calves predominantly present. Our data on the prevalence of calves' diseases at Jhenaidah district of Bangladesh will give a valuable insight to establish research-based study of specific disease and implementation of appropriate preventive measures to prevent the calf mortality, improve the health status of cattle population. Necessary steps of biosecurity management should be taken to prevent seasonal influence of infectious and other diseases of calves. Proper feeding, management and with regular anthelmintic therapy or anti-parasitic drug is therefore necessary to gain maximum healthy calves from cattle. Therefore, further studies would be required for the identification and characterization of etiological agents.

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CONFLICT OF INTEREST

The authors declare that there is no conflict of interest.

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