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Retrospective study of clinical cases presented at veterinary hospitals in Khartoum State, Sudan

Afrah Mahmoud Abusara[1] and Atif Elamin Abdelgadir[2]*

[1]Private sector, Khartoum North, Sudan.
[2]Department of Preventive Medicine and Public Health, Faculty of Veterinary Medicine, University of Khartoum, Sudan.

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The study was conducted in Veterinary Hospitals in Khartoum state in order to determine the clinical cases in different animal species. Many Bovine diseases were diagnosed in different Veterinary Hospitals in Khartoum State from 2010 to 2012. A total of (204) cases were recorded all over the state and the highest overall prevalence rate was observed for surgical interferences 35.78% (n = 73), parasitic diseases 33.33% (n = 68) and bacterial and viral diseases 20.09% (n = 41), while the lowest overall prevalence rate was obtained for disorder of digestive system 5.39% (n = 11) and metabolic diseases 5.39% (n = 11). The most important bacterial and viral diseases that were diagnosed in all Veterinary Hospitals were contagious bovine pleuro pneumonia (CBPP), mastitis and foot and mouth disease (FMD) given an overall prevalence rate of 48.78, 19.51 and 12.20% (n = 20, 8 and 5, respectively). Internal parasites were recorded as the most frequent parasitic diseases 45.59% (n = 31). The clinical cases which required surgical interference were uterine prolapsed 9.59%, retained placenta 23.29%, foreign bodies 5.48%, dystocias 21.92%, (out of 73), (n = 7, 17, 4 and 16, respectively). High morbidity rate of bacterial, viral and parasitic diseases as well as disorder of digestive system were observed for ovine in Omdurman Veterinary Hospital with prevalence rate of 35.02, 35.83 and 17.21% (out of 494), (n = 173, 177 and 85, respectively). Surgical interferences and metabolic diseases were also prevalent in the same species in all veterinary clinics 12.13 and 4.20% (out of 643) (n = 78 and 27, respectively). The major caprine diseases diagnosed in Khartoum Veterinary Hospital were bacterial, viral and parasitic diseases as well as disorder of digestive system 30.12, 22.93 and 16.54% (out of 2171) (n = 654, 498 and 359, respectively). High morbidity rate of surgical interferences and metabolic disease 22.80 and 7.60% (out of 2171) (n = 495 and 165, respectively) were also observed. Among the bacterial, viral and parasitic diseases of caprine, contagious caprine pleuro pneumonia (CCPP), mastitis, internal parasites and tick infestation were recorded as a common clinical cases with prevalence rate of 57.19, 27.68, 97.52 and 18.67% (out of 654 and 498) (n = 374, 181, 396 and 93, respectively). There were 1442 clinical cases observed for equine. Surgical interferences and parasitic diseases were dominant with an overall prevalence rate of 43.41% (n = 626) and 21.08% (n = 304), respectively. The most frequent bacterial, viral and parasitic diseases (out of 182 and 304) that diagnosed in Khartoum Veterinary Hospital were pneumonia, tetanus, coccidiosis, babesiosis, external parasites and internal parasites with prevalence rate 91.2% (n = 160), 3.85% (n = 7), 0.66% (n = 2), 19.41% (n = 59), 13.82% (n = 42) and 59.54% (n = 181), respectively. Surgical interferences in equine (626 cases) most probably due to wound, fracture and trauma 59.11% (n = 370), sharp teeth 14.70% (n = 92), tendonitis 10.06% (n = 63), arthritis 5.9% (n = 37), tumors 4.95% (n = 31) and lameness 2.56% (n = 16).

Key words: Clinical cases, veterinary hospitals, Khartoum state, Sudan.

*Corresponding author. E-mail: atifvet@yahoo.com

INTRODUCTION

The economic importance of sheep, cattle and poultry depends on the value of production and services which include meat, milk, wool and skins. Horse and donkey are steadily increasing in Sudan rather than many other African countries due to poverty. They play an important role in the provision of energy for agricultural production by way of traction of cultivation and transport of products.

The production of livestock in Sudan faces many problems including infectious disease caused by bacterial disease, viral and parasitic agents. Bacterial and viral disease has almost been brought under control either by drug therapy or vaccination. Parasitic disease, however, have largely been neglected primarily because they do not often cause acute fetal disease. Blood parasites are living organisms which inhabit on blood and feed on its constituents or nutrients. The blood parasites are difficult to control due to the resistance of some parasites to drugs, and there is no successful vaccine against most of blood parasites due to several factors such as antigenic variation and difficulties in propagation of these organisms in artificial media. The infection with blood parasites can be suspected from general symptoms of disease such as decrease in production, emaciation, loss of appetite and jaundice. Animal also take time to reach the peak of production after recovery (Herenda, 1994).

Objectives

1. To classify nature and type of diseases and disease conditions in animals presenting to the veterinary clinics.
2. To identify prevalent disease of economic importance or zoonotic nature diagnosed in the veterinary clinics.
3. To suggest plans for controlling of diseases.

MATERIALS AND METHODS

Study area

The study was conducted in Khartoum State which is situated in northern Sudan between latitude 15° 38`N and longitude 32° 26`E. The total area extends over approximately 21,000 square kilometer. The climate of Khartoum is an arid type which is characterized by a wide range in daily and seasonal temperatures. During cool season between December to February, the weather is cool and dry with minimum daily temperature of 24°C. The season is characterized by low humidity. A hot dry weather prevails between March to October, a temperature of 45°C may occur during the day. The maximum rainfall is during the period from mid July to September, in this season there is an increase in relative humidity with a maximum of 68% in August. It is more convenient to divide the year into a cool dry season, hot dry season and hot wet season. Khartoum state is divided into three administration governorates:

1. Khartoum.
2. Omdurman.
3. Khartoum North.

Veterinary hospitals in Khartoum state include:

1. Omdurman Veterinary Hospital.
2. Khartoum Veterinary Hospital (Abu hamama).
3. Khartoum North Veterinary Hospital.

Study population

The study populations were bovine, caprine, ovine, poultry, equine, canine and feline that presented in Khartoum Veterinary Hospital.

Data collection

Data was collected from annual report of the Veterinary Hospitals in Khartoum state from 2010 to 2012. The records include all animal information, owner name, sex, species, case history, tentative, final diagnosis and treatment.

Type of diagnosis

Clinical examinations (tentative diagnosis)

The clinical examination of sick animal utilized various methods of examination. These methods are applicable to both the preliminary general examination of the sick animal and the detailed examination of the individual body systems. These methods as follows:

Inspection: This is a visual examination of the whole animal. It includes a detailed inspection of individual tissue and organs.

Palpation: This is an act of handling the tissue. Palpation consists of the application of firm but gentle pressure with the fingers. This method may be obtained by regarding the presence or absence of pain in particular tissue. By palpation, it may be possible to demonstrate abnormalities in shape, size or consistency of organ or tissue.

Percussion: This is an act of striking a short sharp blew on a part of the body with the object of response. When the part is struck directly with the finger tips, the procedure is termed immediate percussion.

Auscultation: This is an act of listening to the sounds produced by functional activity in various parts of the body. It is a direct application of the ear to the part by a stethoscope.

Sense of smell: The sense of smell is frequently of value to the veterinary surgeons such that certain diseases are associated with the development of characteristic odors associate with them.

Other diagnostic procedures: The site of the disease process includes the passage of sounds, catheters, puncture, rectal examination, oesophagoscope, ophthalmoscope and mechanical aids to diagnosis such as (X-ray).

Laboratory examinations

Allergic reactions

These tests are applied to the individual animal. It is a skin test by detection of sub clinical cases of a specific infection.

Clinical chemistry

This involves estimation of the blood content such as urea, glucose, calcium and magnesium. The blood sample is taken from sick animal before treatment.

Bacteriological examinations

The identification of causal organism can be achieved by microscopic examination of stained smears, culture.

Parasitological examination

Skin scarping permit the identification of ecto parasites. Eggs of parasitic infection are identified by the number of eggs in a given weight of faeces.

Serological examinations

1. Agglutination test.
2. Complement fixation test (CFT).
3. Gel diffusion test.
4. ELIZA.

Haematological examinations

A simple estimation of the hemoglobin level may be sufficient to confirm a tentative diagnosis of anemia. Investigation of white blood cell picture may indicate the type of response associated with the illness and may indicate a defensive reaction to infection.

Analysis for poisons

Confirmation of a tentative diagnosis of poisoning can be based on the chemical identification of suspected poison in material obtained from the animal.

Mechanical aids to diagnosis

This include radiological examination for small animals like dog and cat.

RESULTS

Many bovine diseases were diagnosed in different Veterinary Hospitals in Khartoum State from 2010 to 2012. A total of (204) cases were recorded all over the state and the highest overall prevalence rate was observed for surgical interferences 35.78% (n = 73), parasitic diseases 33.33% (n = 68) and bacterial and viral diseases 20.09% (n = 41). While the lowest overall prevalence rate was obtained for disorder of digestive system 5.39% (n = 11) and metabolic diseases 5.39% (n = 11). The details of the results are presented in Table 1. The most important bacterial and viral diseases that were diagnosed in all Veterinary Hospitals were contagious bovine pleuro pneumonia (CBPP), mastitis and foot and mouth disease (FMD) given an overall prevalence rate of 48.78, 19.51 and 12.20% (n = 20, 8 and 5, respectively). Internal parasites were recorded as the most frequent parasitic diseases 45.59% (n = 31) (Table 2). The clinical cases which required surgical interference were uterine prolapsed 9.59%, retained placenta 23.29%, foreign bodies 5.48%, dystocias 21.92% (out of 73) (n = 7, 17, 4 and 16, respectively).

High morbidity rate of bacterial, viral and parasitic diseases as well as disorder of digestive system were observed for ovine in Omdurman Veterinary Hospital with prevalence rate of 35.02, 35.83 and 17.21% (out of 494) (n = 173, 177 and 85, respectively). Surgical interferences and metabolic diseases were also prevalent in the same species in all veterinary clinics 12.13 and 4.20% (out of 643) (n = 78 and 27, respectively). The rest of the results are presented in Table 3. Maycoplasma, mastitis, heart water, sheep pox, arthritis and internal parasites were considered as the most important clinical cases of ovine in Veterinary Clinics of Khartoum State 74.79, 10.68, 3.85, 2.56, 1.71 and 81.19% (out of 234 and 202) (n = 175, 25, 9, 6, 4 and 164, respectively) (Table 4). The common cases which need further surgical interference were tumors 29.49% and abscess 15.38% (out of 78) (n = 23 and 12, respectively).

The major caprine diseases diagnosed in Khartoum Veterinary Hospital were bacterial, viral and parasitic diseases as well as disorder of digestive system 30.12, 22.93 and 16.54% (out of 2171) (n = 654, 498 and 359, respectively). High morbidity rate of surgical interferences and metabolic disease 22.80 and 7.60% (out of 2171) (n = 495 and 165, respectively) were observed in (Table 5). Among the bacterial, viral and parasitic diseases of caprine, CCPP, mastitis, internal parasites and tick infestation were recorded as a common clinical cases with prevalence rate of 57.19, 27.68, 97.52 and 18.67% (out of 654 and 498) (n = 374, 181, 396 and 93, respectively) (Table 6). Clinical cases associated with disorder of digestive system were most probably due to enteritis, bloat and diarrhea with prevalence rate of 49.30, 12.53 and 24.79% (out of 359) (n = 177, 45 and 89, respectively). Metabolic diseases were due to pregnant toxemia, hypoglasemia, vitamin deficiency and acidosis 36.79, 9.09, 32.12 and 4.85% (out of 165) (n = 61, 15, 53 and 8, respectively). The most frequent cases due to surgical interference were wound, fracture and trauma 22.02%, foreign bodies 20.60%, dystocia 20.00%, abscess 9.49%, retained placenta 8.28%, tumors 7.47% and uterine prolapsed 5.66% (out of 495) (n = 109, 102, 99, 47, 41, 37 and 38, respectively).

A total of 277 clinical cases of the poultry were diagnosed in Khartoum Veterinary Hospitals. These clinical cases are as follows: bacterial and viral diseases

Table 1. Bovine diseases diagnosed in Khartoum Veterinary Hospitals (2010, 2011, 2012).

Study site	No. examined	Bacterial and viral diseases	Disorder of digestive system	Parasitic diseases	Metabolic diseases	Surgical interferences
			Frequency (%)			
Khartoum Veterinary Hospital	143	28 (19.28)	10 (6.99)	33 (23.08)	8 (5.59)	64 (44.75)
Khartoum North Veterinary Hospital	29	1 (3.45)	0 (0.0)	24 (82.76)	0 (0.0)	4 (13.79)
Omdurman Veterinary Hospital	32	12 (37.5)	1 (3.13)	11 (34.375)	3 (9.38)	5 (15.63)
Total	204	41 (20.10)	11 (5.40%)	68 (33.33)	11 (5.39)	73 (35.78)

Table 2. Bacterial, viral and parasitic diseases of bovine diagnosed in the Khartoum Veterinary Hospitals (2010, 2011, 2012).

Clinical cases	Khartoum Veterinary Hospital	Omdurman Veterinary Hospital	Khartoum North Veterinary Hospital	Total
		Frequency (%)		
Bacterial and viral diseases				
Contagious Bovine pleuro pneumonia (CBPP)	15 (36.59)	5 (12.20)	0 (0.0)	20 (48.78)
Mastitis	6 (14.63)	2 (4.9)	0 (0.0)	8 (19.51)
Metritis	3 (7.32)	0 (0.0)	0 (0.0)	3 (7.31)
Brucellosis	1 (2.44)	1 (2.43)	0 (0.0)	2 (4.88)
Foot and mouth disease (FMD)	0 (0.0)	5 (12.20)	0 (0.0)	5 (12.20)
Arthritis	2 (4.88)	0 (0.0)	0 (0.0)	2 (4.88)
Eye Infection	1 (2.44)	0 (0.0)	0 (0.0)	1 (2.44)
Subtotal	28 (68.29)	13 (31.71)	0 (0.0)	41 (100)
Parasitic diseases				
Internal parasites	12 (17.65)	4 (5.88)	15 (22.06)	31 (45.59)
Tick Infestation	5 (7.35)	2 (2.94)	9 (13.24)	16 (23.53)
Thieleriosis	16 (23.53)	5 (7.35)	0 (0.0)	21 (30.88)
Subtotal	33 (48.52)	11 (16.18)	24 (35.29)	68 (100)

53.79% (n = 149), parasitic disease 28.52% (n = 97), disorder of digestive system 5.42% (n = 15) and metabolic diseases 5.78% (n = 16) (Figure 1). The most common bacterial, viral and parasitic disease of poultry (out of 149 and 97) were *Escherichia coli*, New Castle infections, pneumonia, salmonellosis, coccidiosis, tick infestation and internal parasites with prevalence rate 1.34% (n = 2), 13.40% (n = 20), 40.26%

Table 3. Ovine diseases diagnosed in Khartoum Veterinary Hospitals (2010, 2011, 2012).

Study site	No. examined	Bacterial and viral diseases	Disorder of digestive system	Parasitic diseases	Metabolic diseases	Surgical interferences
			Frequency (%)			
Khartoum Veterinary Hospital	133	49 (36.84)	17 (12.78)	23 (17.29)	13 (9.77)	31 (23.31)
Khartoum North Veterinary Hospital	16	12 (75.00)	0 (0.0)	2 (12.5)	0 (0.0)	2 (12.5)
Omdurman Veterinary Hospital	494	173 (35.02)	85 (17.21)	177 (35.83)	14 (2.83)	45 (9.11)
Total	643	234 (36.39)	102 (15.86)	202 (31.42)	27 (4.20)	78 (12.13)

Table 4. Bacterial, viral and parasitic diseases of Ovine diagnosed in Khartoum Veterinary Hospitals (2010, 2011, 2012).

Clinical cases	Khartoum Veterinary Hospital	Omdurman Veterinary Hospital	Khartoum North Veterinary Hospital	Total
		Frequency (%)		
Bacterial and viral diseases				
1. Mycoplasmosis	29 (12.39)	134 (57.26)	12 (5.13)	175 (74.79)
2. Mastitis	7 (2.99)	18 (7.69)	0 (0.0)	25 (10.68)
3. Metritis	0 (0.0)	3 (1.28)	0 (0.0)	3 (1.28)
4. Brucellosis	2 (0.85)	0 (0.0)	0 (0.0)	2 (0.85)
5. Arthritis	4 (1.71)	0 (0.0)	0 (0.0)	4 (1.71)
6. Rabies	1 (0.43)	2 (0.85)	0 (0.0)	3 (1.28)
7. Peste de petites(ppr)	1 (0.43)	1 (0.43)	0 (0.0)	2 (0.85)
8. Sheep pox	1 (0.43)	5 (2.14)	0 (0.0)	6 (2.56)
9. Tetanus	4 (1.71)	1 (0.43)	0 (0.0)	5 (2.14)
10. Heart water	0 (0.0)	9 (3.85)	0 (0.0)	9 (3.85)
Subtotal	49(20.94)	173 (73.93)	12 (5.13)	234 (100)
Parasitic Diseases				
1. Internal parasite	19 (9.41)	145 (71.78)	0 (0.0)	164 (81.19)
2. Ticks Infestation	4 (1.98)	24 (11.88)	0 (0.0)	28 (13.86)
3. Thieleriosis	0 (0.0)	2 (0.99)	2 (0.99)	4 (1.98)
4. Mange	0 (0.0)	2 (0.99)	0 (0.0)	2 (0.99)
5. Coccidiosis	0 (0.0)	4 (1.98)	0 (0.0)	4 (1.98)
Subtotal	23 (11.39)	177 (87.62)	2 (0.99)	202 (100)

Table 5. Caprine diseases diagnosed in Khartoum Veterinary Hospitals (2010, 2011, 2012).

Study site	No. examined	Bacterial and viral disease	Disorder of digestive system	Parasitic diseases	Metabolic diseases	Surgical interferences
			Frequency (%)			
Khartoum Veterinary Hospital	842	258 (30.64)	124 (14.73)	143 (15.92)	79 (9.38)	238 (28.27)
Khartoum North Veterinary Hospital	40	9 (22.5)	16 (40.00)	7 (17.5)	8 (20.5)	0 (0.0)
Omdurman Veterinary Hospital	1289	387 (30.02)	219 (16.99)	348 (27.00)	78 (6.05)	257 (19.95)
Total	2171	654 (30.12)	359 (16.54)	498 (22.93)	165 (7.60)	495 (22.80)

Table 6. Bacterial, viral and parasitic diseases of Caprine diagnosed in Khartoum Veterinary Hospitals (2010, 2011, 2012).

Clinical cases	Khartoum Veterinary Hospital	Omdurman Veterinary Hospital	Khartoum North Veterinary Hospital	Total
		Frequency (%)		
Bacterial and viral diseases				
Contagious caprine pleuro pneumonia (CCPP)	175 (26.76)	196 (29.97)	3 (0.46)	374 (57.19)
Mastitis	53 (8.10)	122 (18.65)	6 (0.92)	181 (27.68)
Metritis	10 (1.53)	28 (4.28)	0 (0.0)	38 (5.81)
Brucellosis	6 (0.92)	3 (0.46)	0 (0.0)	9 (1.38)
Arthritis	0 (0.0)	15 (2.30)	0 (0.0)	15 (2.30)
Eye infections	0 (0.0)	9 (1.38)	0 (0.0)	9 (1.38)
Sheep pox	10 (1.53)	3 (0.46)	0 (0.0)	13 (0.46)
Rabies	0 (0.0)	3 (0.46)	0 (0.0)	3 (0.46)
Tetanus	0 (0.0)	3 (0.46)	0 (0.0)	3 (0.46)
Black leg	0 (0.0)	1 (0.15)	0 (0.0)	1 (0.15)
Heart water	0 (0.0)	1 (0.15)	0 (0.0)	1 (0.15)
Peste de petites (PPR)	4 (0.61)	3 (0.46)	0 (0.0)	7 (1.07)
Subtotal	258 (39.45)	387 (59.17)	9 (1.38)	654 (100)
Parasitic disease				
Internal parasites	81 (16.27)	308 (61.85)	7 (1.41)	396 (79.52)
Ticks infestation	61 (12.25)	32 (6.43)	0 (0.0)	93 (18.67)
Mange	1 (0.20)	6 (1.21)	0 (0.0)	7 (1.41)
Coccidiosis	0 (0.0)	2 (0.40)	0 (0.0)	2 (0.40)
Subtotal	143 (28.72)	346 (69.48)	7 (1.41)	498 (100)

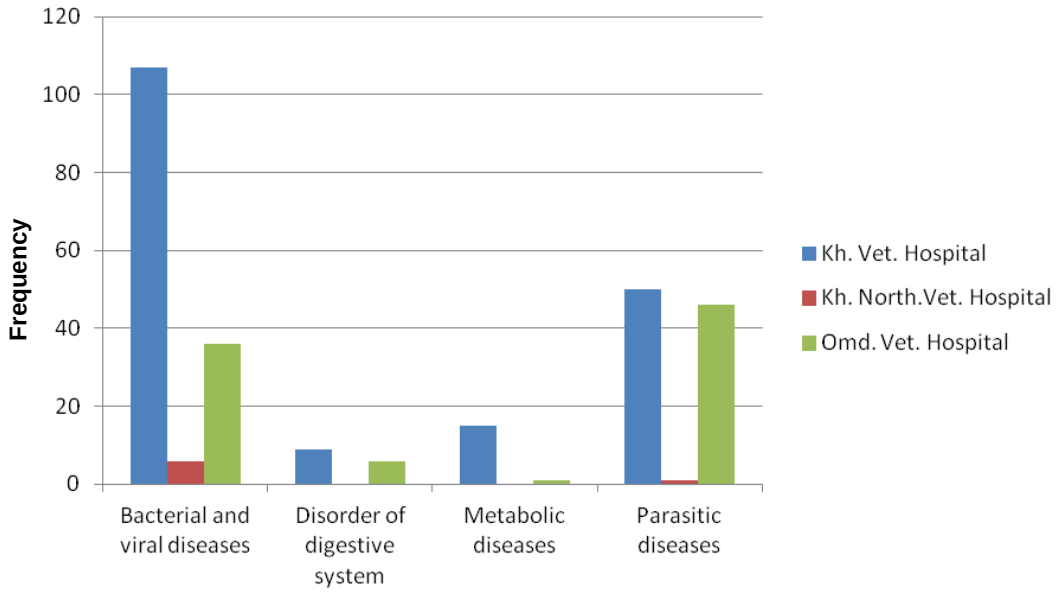

Figure 1. Poultry diseases diagnosed in Khartoum Veterinary Hospitals (2010, 2011, 2012).

(n = 60), 16.11% (n = 24), 7.22% (n = 7), 12.37% (n = 12) and 78.35% (n = 76), respectively (Table 7).

There were 1442 clinical cases observed for equine. Surgical interferences and parasitic diseases were dominant with an overall prevalence rate of 43.41% (n = 626) and 21.08% (n = 304), respectively (Table 8). The most frequent bacterial, viral and parasitic diseases (out of 182 and 304) that diagnosed in Khartoum Veterinary Hospital were pneumonia, tetanus, coccidiosis, babesiosis, external parasites and internal parasite with prevalence rate 91.2% (n = 160), 3.85% (n = 7), 0.66% (n = 2), 19.41% (n = 59), 13.82% (n = 42) and 59.54% (n = 181), respectively. The rest of the results are shown in Table 9. Surgical interferences in equine (626 cases) were most probably due to wound, fracture and trauma 59.11% (n = 370), sharp teeth 14.70% (n = 92), tendonitis 10.06% (n = 63), arthritis 5.9% (n = 37), tumors 4.95% (n = 31) and lameness 2.56% (n = 16).

There were a number of clinical cases (n = 585) that were diagnosed in canine such as parasitic diseases 48.89% (n = 286), surgical interferences 15.56% (n = 91), bacterial and viral diseases 14.19% (n = 83) (Table 10). The most prevalent diseases were canine distemper 37.55% (n = 31), pneumonia 13.33% (n = 26), rabies 6.02% (n = 5) and tick infestation 83.22% (n = 238). Many clinical cases (n = 92) of feline were observed in the Veterinary Clinics of Khartoum State. High overall prevalence rate was obtained for surgical interferences 32.61% (n = 30), bacterial and viral diseases 20.65% (n = 19) and disorder of digestive system 19.57% (n = 18) (Table 11). The most common clinical cases of feline were pneumonia 73.68% (n = 14) and rabies 5.26% (n = 1).

DISCUSSION

The study was conducted in veterinary clinics in Khartoum State. Many clinical cases in different species were observed from 2010 to 2012. As seen from the results, bacterial, viral and parasitic diseases were found the most dominants clinical cases diagnosed in bovine in Veterinary Hospitals. Similarly, Siham et al. (2008) stated that the bacterial and viral diseases represented 45.3% of the cases among the animals admitted to Hillat Kuku Veterinary Teaching Hospital (HKVTH), College of Veterinary Medicine and Animal Production, Sudan University of Science and Technology during period 1997 to 2006. Among these diseases, mastitis, conjunctivitis, tetanus, rabies, pneumonia and arthritis were recorded. An increase in the prevalence rate of bovine mastitis was also recorded (33%) by Noul (2009) in dairy farms of Kuku area. He mentioned that there were many risk factors associated with occurrence of bovine mastitis in dairy farms such as age, parity, stage of lactation and lesions on the udder as well as general hygienic conditions in the farms. Moreover, Saluiemi (1980) reported that it there was mastitis problem with cows in a loose horse, the cause is as a result of poor milking hygiene or milking machine. Our results regarding foot and mouth disease (FMD) is in agreement with Niema (2005) who found 4 serotypes in serum samples from

Table 7. Bacterial, viral, fungal and parasitic diseases of Poultry diagnosed in Khartoum Veterinary Hospitals (2010, 2011, 2012).

Clinical cases	Khartoum Veterinary Hospital	Omdurman Veterinary Hospital	Khartoum North Veterinary Hospital	Total
	Frequency (%)			
Bacterial , viral and fungal diseases				
Escherichia coli infection	0 (0.0)	2 (1.34)	0 (0.0)	2 (1.34)
Newcastle disease (NCD)	19 (12.75)	0 (0.0)	1 (0.67)	20 (13.42)
Fowl Pox	13 (0.67)	0 (0.0)	0 (0.0)	13 (8.72)
Infectious coryaza	3 (2.01)	0 (0.0)	0 (0.0)	3 (2.01)
Arthritis	0 (0.0)	1 (0.67)	0 (0.0)	1 (0.67)
Leuokosis	1 (0.67)	0 (0.0)	0 (0.0)	1 (0.67)
Pnemonia	30 (20.13)	25 (16.78)	5 (3.36)	60 (40.27)
Fowl typhoid	2 (1.34)	0 (0.0)	0 (0.0)	2 (1.34)
Salmonellosis	24 (16.11)	0 (0.0)	0 (0.0)	24 (16.11)
Trichomons	7 (4.70)	0 (0.0)	0 (0.0)	7 (4.70)
Bacterial infection	8 (5.37)	0 (0.0)	0 (0.0)	8 (53.70)
Fungal diseases	0 (0.0)	8 (5.37)	0 (0.0)	8 (53.70)
Subtotal	107 (71.82)	36 (24.16)	6 (4.03)	149 (100)
Parasitic diseases				
Coccidiosis	6 (6.19)	1 (1.03)	0 (0.0)	7 (7.22)
Tick infestation	10 (10.31)	1 (1.03)	1 (1.03)	12 (12.37)
Internal parasites	34 (35.05)	42 (43.30)	0 (0.0)	76 (78.35)
Mange	0 (0.0)	2 (2.06)	0 (0.0)	2 (2.06)
Subtotal	50 (51.55)	46 (47.42)	1 (1.03)	97 (100)

Table 8. Equine diseases diagnosed in Khartoum Veterinary Hospitals (2010, 2011, 2012).

Study site	No. examined	Bacterial and viral diseases	Disorder of digestive system	Metabolic diseases	Surgical interferences	Parasitic diseases	Uorogenital diseases
				Frequency (%)			
Khartoum Veterinary Hospital	293	34 (11.60)	26 (8.87)	11 (3.75)	145 (49.49)	67 (22.87)	10 (3.41)
Khartoum North Veterinary Hospital	42	0 (0.0)	1 (2.38)	1 (2.38)	40 (95.24)	0 (0.0)	0 (0.0)
Omdurman Veterinary Hospital	1107	148 (13.37)	152 (13.73)	102 (9.21)	441 (39.83)	237 (21.41)	27 (2.44)
Total	1442	182 (12.62)	179 (12.14)	114 (7.91)	626 (43.41)	304 (21.08)	37 (2.57)

Table 9. Bacterial, viral diseases and parasitic diseases of equine diagnosed in the Khartoum Veterinary Hospitals (2010, 2011, 2012).

Clinical cases	Khartoum Veterinary Hospital	Omdurman Veterinary Hospital	Khartoum North Veterinary Hospital	Total
	Frequency (%)			
Bacterial and viral diseases				
Pneumonia	34 (18.68)	132 (72.53)	0 (0.0)	166 (91.21)
Tetanus	0 (0.0)	7 (3.85)	0 (0.0)	7 (3.85)
Pharyngitis	0 (0.0)	1 (0.55)	0 (0.0)	1 (0.55)
Eye Infections	0 (0.0)	5 (2.75)	0 (0.0)	5 (2.75)
Foot rot	0 (0.0)	3 (1.65)	0 (0.0)	3 (1.65)
Subtotal	34 (18.68)	148 (81.32)	0 (0.0)	182 (100)
Parasitic Diseases				
Coccidiosis	0 (0.0)	2 (0.60)	0 (0.0)	2 (0.60)
Babesiosis	0 (0.0)	59 (19.41)	0 (0.0)	59 (19.41)
External parasite	18 (5.92)	24 (7.89)	0 (0.0)	42 (13.82)
Internal parasite	47 (15.46)	134 (44.08)	0 (0.0)	181 (59.54)
Mange	2 (0.66)	18 (5.92)	0 (0.0)	20 (6.58)
Subtotal	67 (22.04)	237 (77.96)	0 (0.0)	304 (100)

Khartoum State. It is worth to mention that internal parasites were the highest cases. These findings are in agreement with Siham et al. (2008) who stated that interval parasites were common among the cases of alimentary tract disorders in all species especially during the summer and autumn. The presence of interval parasitic could be attributed to bad management and poor hygiene.

Low prevalence rate of bovine brucellosis was observed in this study. Similarly, Osman and Adalan (1986) stated that prevalence rate of brucellosis was high among the cattle and camels but rare among goats and sheep. Study by El-Ansary et al. (2001) also confirmed low prevalence rate of brucellosis in sheep. Low infection rate of brucellosis in sheep could be attributed to good healthy status of these animals as well as good management practice. As seen from the results, external parasites, particularly tick infestation, was found with high prevalence rate in ovine in different Veterinary Hospitals in Khartoum State. Badria (2004) previously identified the four tick genera and different species. Occurrences of tick infestation are most probably due to fact that most of the owner did not consider using of insecticides for control of ticks and other flies.

The highest percentage of clinical cases that diagnosed in Khartoum Veterinary hospital in Khartoum State was recorded for *Caprine* species. This is due to the importance of caprine for traditional breeding as well as meat and milk production to some residents. On the other hand, lacking good environment and health care might lead to spreading of the diseases among these animals. The second large amounts of clinical cases diagnosed in Veterinary Clinics of Khartoum State were determined for equine (horse and donkey) and this explains the importance of these animals for transportation for some people in Khartoum State. Surgical interferences such as wound, fracture, trauma, arthritis and tendonitis were recorded as high prevalence rate for equine species. This finding was previously confirmed by Siham et al. (2008) and attributed to the increase work load put on these animals together with poor feeding programs. Sharp teeth were other important clinical cases for equine in this study. Radostits et al. (2007) mentioned that sharp teeth are considered to be the main cause of stomatitis.

Parasitic diseases, canine distemper and some form of rabies were observed for canine in Veterinary Clinics of Khartoum State. Few studies on canine disease were achieved in Sudan. For instance, Nahid (2005) examined two hundred and eleven dogs using faecal examination and she found high prevalence rate of Giardia infection (59%). Bacterial, viral and parasitic diseases were common diseases that were observed for poultry in Khartoum State. High prevalence rate among these diseases was observed for Newcastle and this might be due to availability of vaccine. Internal parasites were also prevalent with high infection rate in poultry in Khartoum State. The results are in agreement with Somia (2008) who examined the local breed of poultry for helminthes and her results revealed that two species of cestodes were present in local breed chicken in Khartoum State.

Table 10. Canine diseases diagnosed in Khartoum Veterinary Hospitals (2010, 2011, 2012).

Study site	No. Examined	Bacterial and viral diseases	Disorder of digestive system	Metabolic diseases	Parasitic diseases	Surgical interferences	Poisoning	Urogenital diseases
				Frequency (%)				
Khartoum Veterinary Hospital	369	45 (12.20)	33 (8.94)	20 (5.42)	176 (47.70)	74 (20.05)	19 (5.15)	2 (0.54)
Khartoum North Veterinary Hospital	17	4 (23.53)	0 (0.0)	0 (0.0)	10 (28.82)	2 (11.76)	1 (5.88)	0 (0.0)
Omdurman Veterinary Hospital	199	34 (17.09)	14 (7.04)	20 (10.05)	100 (50.25)	15 (7.54)	11 (5.53)	5 (2.51)
Total	585	83 (14.19)	47 (8.03)	40 (6.84)	286 (48.89)	91 (15.55)	31 (5.30)	7 (1.20)

Table 11. Feline diseases diagnosed in Khartoum Veterinary Hospitals (2010, 2011, 2012).

Study site	No. examined	Bacterial and viral disease	Disorder of digestive system	Metabolic diseases	Surgical interferences	Parasitic diseases	Uorogenital diseases
				Frequency (%)			
Khartoum Veterinary Hospital	57	17 (29.82)	10 (17.54)	3 (5.26)	21 (36.84)	3 (5.26)	3 (5.26)
Khartoum North Veterinary Hospital	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Omdurman Veterinary Hospital	35	2 (5.71)	8 (22.86)	6 (17.14)	9 (25.71)	4 (11.43)	6 (17.14)
Total	92	19 (20.65)	18 (19.57)	9 (9.78)	30 (32.61)	7 (7.61)	9 (9.78)

Conclusion

Many clinical cases including bacterial, viral, parasitic and metabolic diseases as well as surgical interferences were observed in different species of the animals in Veterinary Hospitals in Khartoum State. Therefore, the veterinary authority must improve management, husbandry, feeding and veterinary services all over the country.

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