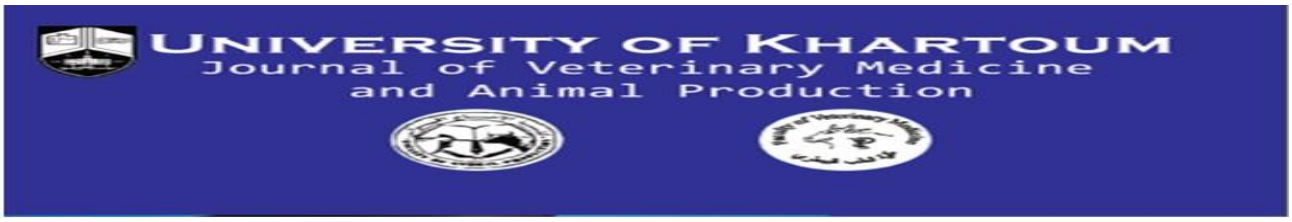
U. of K. J. Vet. Med. Anim. Prod., Vol. 5, Issue 2 (2014) p 53-57

ISSN: 243456



Incidence of infectious bursal disease in chickens submitted to the Veterinary Research Institute (VRI), Khartoum-Sudan

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Abstract

The incidence of infectious bursal disease (IBD) among cases submitted to the poultry diseases and diagnosis Department, (VRI) Khartoum-Sudan was investigated during the years 2000-2012. The overall incidence of IBD cases was 4.2%. The highest rate (12%) was reported in the year 2000 and the lowest (2%) in 2009. The outbreaks were more recorded in Summer (No.=55) than in Autumn (No.=26) and Winter (No.=19) seasons. From the total IBD outbreaks, 62% occurred in layer chickens and 32 % in broiler chickens. Among chicken breeds affected, the Hisex represented (25%) followed by Bovans (22%) and least the Hypro breed (3%). It was noted that highest IBD cases (38.3%) were reported in 16-30 days old chickens, 36.2% in the age group 31-45 days and the least (2.1%) in the age group 0-15 days old. It was concluded that IBD continues to be a serious problem to the poultry industry in Sudan. Comprehensive studies are needed to isolate and characterize the field viruses and study the effectiveness of vaccines used.

Keywords: incidence, IBDV, chickens, Sudan

المستخلص

رصدت نسبة الاصابة بمرض القمبورو لحالات الدواجن الوارده للتشخيص بقسم تشخيص امراض الدواجن- معهد البحوث البيطرية (الخرطوم-السودان) في الفترة من 2000 الى 2012م. كانت النسبة العامة للاصابه 4.2%. كان اعلي معدل للإصابة (12%) في العام 2000 و ادناه (2%) في العام 2009. سجل موسم الصيف أعلي بلاغات للمرض (55) حالة مقارنة بالخريف (26) و 19 حالة في الشتاء. سجلت 62% من البلاغات في دجاج البيض و 32% في دجاج اللاحم. اما بالنسبة لسلالات الدجاج فاعلي معدل اصابة (25%) دونت لسلالة الهايسكس و (22%) للبوفان و(3%) للهايبرو. سجل أعلي معدل اصابة للمرض (38.6%) في الدجاج عمر 16-30 يوم و 36.2% إصابة في عمر 31-45 يوم وأدناها (2.1%) في عمر 0-15 يوم. يستنتج من الإحصائيات أعلاه ان مرض القمبورو يمثل مشكلة خطيرة لصناعة الدواجن بالسودان و هناك حوجة لدراسات أوفر لدراسة وعزل الفيروسات الحقلية وفعالية اللقاحات المستخدمة.

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Introduction

Infectious bursal disease (IBD) is an acute, highly contagious viral infection of young chickens caused by Birnavirus. The IBD virus is ubiquitous, highly stable with tendency to persist in the environment despite thorough cleaning and disinfection, thus IBDV is endemic in most poultry producing areas of the world (Lukert and Saif, 2003) and is considered as one of the major economically important diseases of poultry despite wide usage of vaccination programs. In unprotected flocks, the virus causes mortality and immunosuppression associated with poor performance resulting in reduced economic return (Schnitzler *et al.*, 1993). Due to the high resistance of IBDV to environmental exposure and its wide distribution, hygienic measures alone, though essential, are often insufficient. Vaccination is thus essential (Lutticken, 1997).

In Sudan, IBD was first reported in 1982 (Shuaib *et al.*, 1983) and since then it was reported repeatedly as one of the major poultry diseases affecting broiler and layer chickens.

The following retrospective study provides information on IBD for 13 consecutive years (200-2012) which may aid in planning for effective disease control programs.

Materials and Methods

IBD diagnosis

IBD was tentatively diagnosed according to history, clinical signs and postmortem findings. Serological confirmation was conducted using agar gel precipitation test as described by Hirai and Shimakura (1974)

Case file records

Monthly reports of IBD covering a period of 13 years, from January 2000 to December 2012, were obtained from case records of avian pathology and diagnosis Department, VRI Khartoum. The date, age, type of birds, breed of chickens and season of occurrence were noted.

The birds were categorized according to the purpose of keeping then into: layers, broilers and unknown (not categorized).

According to age factor, they were grouped into eight groups (Gi-Gviii), (Gi) 0-15 days,(Gii)16-30 days, (Giii) 31-45 days,(Giv) 46-60 days, (v) 61-75 days , (Gvi) over 75 days and (Gvii) unknown ages.

The seasons in Sudan were categorized as: (i) Summer (March to June), (ii) Autumn (July-October) and (iii) Winter (November-February).

Statistical analysis

The data were compiled and analyzed using proportional (percentage) method.

The Chi-Square (X^2) was used to compare IBD specific rates in the year 200-2012. The p-value were calculated. Results were considered significant at $P<0.05$.

Results

During the period 2000-2012, 2404 cases presented for diagnosis. Of these 100 (4.2%) were diagnosed as IBD. The highest incidence (12%) was recorded in the year 2000 and lowest (2%) in 2009. The IBD specific year rate was highest (6.6%) in 2011 and lowest (1.8%) in 2006 with no significant variations (P= 0.4821) (Table 1).

Most of IBD cases (55%) were reported in Summer followed by Autumn (26%) and least in Winter (19%) (Figure1).

Table (1): Annual distribution of IBD cases (%) and the total cases submitted for Diagnosis

Year	IBD cases (%)	Non IBD cases	Year specific rate (%)
2000	12(12)	185	6.1
2001	8(8)	208	3.7
2002	11(11)	214	4.9
2003	11(11)	223	4.7
2004	14(14)	215	6.1
2005	7(7)	192	3.5
2006	4(4)	214	1.8
2007	8(8)	249	3.1
2008	8(8)	210	3.7
2009	2(2)	101	1.9
2010	3(3)	81	3.6
2011	7(7)	99	6.6
2012	5(5)	113	4.2
Total	100	2304	4.2

As illustrated in (figure 2), the Hisex breeds of chickens showed the highest rate of IBD infection (25%) followed by Bovan (22%) and the lowest breed affected was Hypro (3%).

According to age and type of bird, 36 (38.3%) of IBD cases were 16-30 days old and 23 (24.5%) of these were broilers. Thirty four (36.2%) of the IBD cases were 31-45 days old and seven of these were

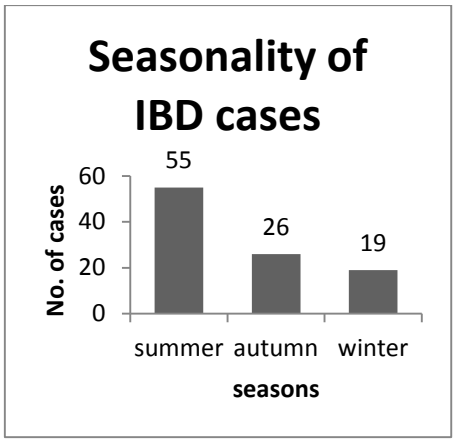

Fig.1 IBD cases recorded in different seasons of the year

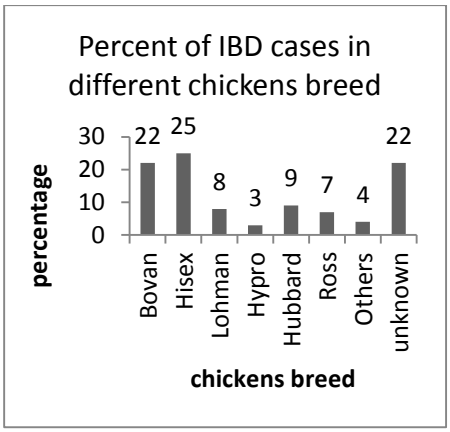

Fig.2 Percentage IBD cases in different breeds of chickens

broilers. The only two cases less than 15 days old were also broilers, making a total of 32. The rest of the cases in the known age groups were layers (No=62), figure 3. of which 13 (21%) were 16-30 days old, 27 (43.5%) were 31-45 days old of age, 14 (22.6%) were 46-60 days old and four (6.5%) for each of the remaining age groups (figure 3).

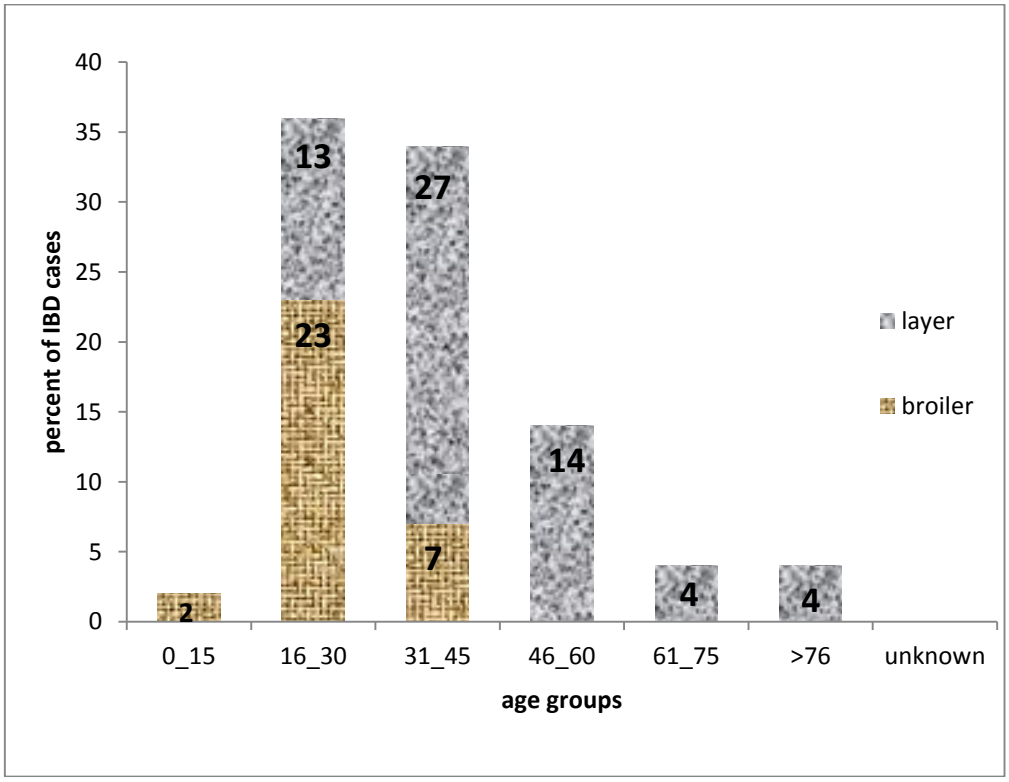

Fig.3. Incidence of IBD according to age and type of bird

Discussion

The incidence of IBD in the present study was among birds submitted for diagnosis to VRI laboratory. Not all sick or dead birds have been to VRI Lab., as there are many other private diagnostic units in Khartoum which can also be consulted, so the present values would be considered conservative.

This study clearly shows that IBD constitutes a problem of all types of production systems and breeds of chickens. It was observed that the IBD cases were not regularly distributed throughout the studied period; the highest cases were recorded in the year 2000 and decreased in subsequent years probably due to the vaccination programs adopted by the owners as a routine practice. The lowest percentages of cases were recorded in the year 2006 that witnessed the occurrence of highly pathogenic avian influenza outbreak in this year; farmers might have been discouraged from keeping birds.

The disease has been recorded throughout the year; but, a comparatively higher number of outbreaks were reported during the summer season compared to autumn and winter seasons. This may be due to the stressful hot day weather in summer. The present finding tends to support that of Khalda *et al.* (2013), who on the basis of six years data (2000-2005), assured that the occurrence of the IBD in Sudan was more frequent in Summer months than other seasons. Also Elhussein *et al*. (1998) observed that the occurrence of IBD outbreaks was more in summer in chickens in Addamer province-Sudan (1993-1997).

Layers chickens were found, in this study, to be more affected than broilers as they are light breeds that are reported to be more susceptible to IBD than heavy breeds (Lukert and Saif, 2003). This result also agrees with Anjum *et al*. (1993) who found that layers were more affected with IBD than broilers and breeders. Conversely, Farooq *et al*. (2000) and Singh et al. (1994) reported higher incidence of IBD in broilers than layers.

The incidence of IBD in this study was found highest in Hisex and Bovans breeds of chickens as they were the most reared breeds in Sudan. Previously it was reported that the White Leghorn breed was most susceptible to IBD infection (Lukert and Saif, 2003).

The present results show that chickens of 16-45 days were most susceptible to IBD infection. The disease is reported to affect chickens of 3-6 weeks old (Lukert and Saif, 2003). Higher incidence of IBD in broiler chickens was recorded in the age of 16-30 days, which agrees with Khursid *et al*. (1994) who reported maximum incidence of IBD (43.4%) in broiler chicks during the 4th week of age. Few cases were reported in 3 and 4 month old birds.

It is concluded that IBD continues to be a serious problem to the poultry industry in Sudan. More studies are needed on the epidemiology of the disease, characterization the field viruses and on the effectiveness of available vaccines, which are important when planning for control strategies.

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