

Short Communication

Laboratory outbreak investigation of sudden death syndrome in broiler chicken in Kathmandu Valley, Nepal

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The incidence of death of broiler birds above 40 days suddenly increased in the month of July to October 2008-2009 in Kathmandu Valley. Birds that were presented for post-mortem examination at the Central Veterinary Laboratory Tripureswor Kathmandu were usually found dead on their backs with wings out-stretched. Gross lesions recorded on post mortem examinations were muscle oedema, pulmonary, renal and liver congestion, dark black to pale yellow streaked liver bile filled gall bladder and congestive splenomegaly, blood clot in atrium haemorrhage in duodenal muscle, whitish yellow pasty fluid in proventriculus gland, greenish coloration marked intact feed particles in gizzard and swollen intestine with excessive mucous filled. Incidence rate was recorded between 1.5 to 2.5% of the flock. The mean mortality rate due to sudden death syndrome was 1.3 to 9.6%. *Penicillium* spp., *Aspergillus* spp., with colony-forming unit (CFU) ranging from 56×10^4 - 62×10^5 , to uncountable mold count, *Escherichia coli*, *Streptococcus* spp. and *Staphylococcus* spp. were the usual organisms isolated from culture samples of liver, lung, spleen and proventriculus. The condition seems to be related to mycotoxicosis. Reduction of mortality was achieved by feed restriction, with 8 to 10% reduction in nutrient density. Supplementation of glucose containing electrolyte, liquid toxin binder, immunomodulator, acidifier and antibiotic therapy.

Key words: Sudden death syndrome, broilers, Kathmandu Valley, *Penicillium*, colony-forming unit, ranging from 56×10^4 to 62×10^5 /g, uncountable mold count, *Aspergillus*, *Escherichia coli*, *Streptococcus*, *Staphylococcus*, liver, proventriculus.

INTRODUCTION

From the first week of August to October 2009 there was a sudden increase in mortality of broilers above 6 week age (Table 1) in Kathmandu valley. There were no premonitory signs. Just before death, birds appear normal and it is common to observe that the birds use to eat, drink or walk normally. Then birds use to exhibit clinical signs such as extending their neck, squawk and start wing beating as well as leg extension before falling on their back.

POSTMORTEM FINDING OF SUDDEN DEATH SYNDROME (SDS) BIRDS

Gross lesions on post mortem examinations recorded were muscle oedema, pulmonary, renal and liver

congestion, dark black to pale yellow streaked liver bile filled gall bladder and congestive splenomegaly, blood clot in atrium haemorrhage in duodenal muscle, whitish yellow pasty fluid in proventriculus gland, greenish coloration marked intact feed particles in gizzard and swollen intestine with excessive mucous filled. All these post-mortem observations conform to the descriptions of the syndrome made by Ononiwu et al. (1979a).

Laboratory finding of mycobiota and microbiota of post-mortem tissue samples

A total 176 tissue samples of lung, liver, spleen, proventriculus and gizzard, were collected during post-mortem examination and were subjected for both bacterial and mycological culture. Results of microbiological examination are given in Table 2, rapid test for AI, ND and IBD (Table 3).

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Table 1. Epidemiology of affected flock with sudden death syndrome in July-October 2009.

Observation/Duration	No. of farmers	Population at risk	Morbidity	(%)	Mortality	(%)	No. of samples examined
July	63	16620	4250	25.57	369	2.22	63
August	51	15450	1235	7.99	232	1.50	51
September	32	10260	848	8.26	157	1.53	32
October	30	15700	2380	15.16	149	0.94	30
Total	176	58030	8713	15.01	907	1.56	176

Table 2. Results of microbiological examination of tissues.

No. of samples	Bacterial isolated	Fungi isolated	Positive no.	Negative no.
176	<i>E. coli</i> , <i>Streptococcus</i> , <i>Staphylococcus</i>	<i>Aspergillus</i> , <i>Penicillium</i> ,	35	141
176			145	31

Table 3. Rapid test for AI, ND, IBD.

Variables	No of samples	Positive	Negative
AI	20		X
ND	20		X
IBD	20		X

A number of 20 samples was examined for AI, ND and IBD, the results were negative.

Treatment and preventive measure given to the rest of birds in flock

All birds remaining in flocks were subjected to restricted feed up to 8 to 10% these percentages differ from the ones in the abstract, and feed twice daily. Supplementation with glucose containing electrolyte, liquid toxin binders, immunomodulator, and simple broad-spectrum antibiotics acidifiers were provided in water. Vitamin B complex supplementation was totally withdrawn. All birds remaining in all affected farms responded well to the above management and there was a marked improvement in the overall condition of the flock.

RESULTS AND DISCUSSION

SDS is an acute heart failure disease that affects mainly fast growing male chickens that seem to be in good condition. Although a common feature in fast growing birds, the pathogenesis remains unclear (Ononiwu et al., 1979b). Cardiac arrhythmias are involved in the pathogenesis of SDS with ventricular arrhythmias (VA) being the most common observation representing premature ventricular contractions and fibrillation (Olkowski and Classen, 1997, 1998). It has been

reported that broilers fed with high vitamin D3 diet above the recommended levels in an attempt to prevent commonly occurring leg problems were 2.5 fold more likely to succumb to acute heart failure and die of SDS (Nain et al., 2007). SDS was also experimentally induced by feeding diets containing the mycotoxin moniliformin that resulted to cardiac injury with subsequent alterations in cardiac electrical conductance (Reams et al., 1997) suggesting the possible role of chronic mycotoxicosis to the causation of SDS.

The present investigation indicates that broilers in good body weight condition when not harvested timely and remaining in poultry shades for prolonged periods suffer stressful events and even die sudden. Also, it is possible that increased humidity and hot seasons favors the growth of mold and fungus in stored feeds increasing the risk of birds to mycotoxicosis.

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