

Hematological Studies in Chickens Infected with Hydro Pericardium Syndrome

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ABSTRACT

The present research project was designed to determine the hematological values in infected broiler flocks with hydropericardium syndrome from January to June, 2012 in order to adjoining areas of Hyderabad Sindh. A total of 72 containing population 96,500 broiler chickens were surveyed to observe for hematological variation during the study period. Only 30 (41.66%) flocks were found affected with Hydro pericardium syndrome. Out of these flocks, the incidence of syndrome was recorded as 5.4% during the month of January, 7.41% in February, 10.8% in March, 13% in April, 15.1% in May and 12.8% during the month of June. The hematological studies were conducted in infected broilers with hydropericardium syndrome and found increase in white blood cells (WBC) from 14.500 ± 2.298 to 25.820 ± 844.00 and concentration of erythrocytic sedimentation rate (ESR) from 2.340 ± 0.89 to 3.458 ± 0.291 . Amongst Leukocytic count, showed marked increase with neutrophils and relative decrease of lymphocytes from 69.360 ± 0.152 to 55.480 ± 2.132 , monocytes 4.660 ± 0.598 to 3.340 ± 270 , eosinophils 1.496 ± 0.204 to 1.004 ± 0.097 and basophils 0.878 ± 0.55 to 0.734 ± 0.067 in infected birds.

Key Words: Hydro pericardium syndrome, Hematology, Broiler, Pericardial sac.

1. INTRODUCTION

The occurrence of hydropericardium syndrome (HPS) causes heavy economic losses to poultry industry in many parts of the world including Pakistan. The Hydro pericardium or Hepatitis Syndrome (HHS) was first recognized in broiler farms in Angara Goth (Goth means small town) near Karachi metropolitan city of Pakistan, in late 1987 (Jaffery et al., 1986, Jaffery et al., 1988, Anjum et al., 1989, Balamurugan and Kataria, 2004). Because the disease emerged in this specific geographic area, Hydro pericardium was initially referred to as "Angara Disease". The syndrome was spread in the densely populated broiler growing areas all over the country within six months. The outbreaks of Hydro pericardium were also recorded in Mexico in 1989 in the high density poultry producing states (Borrego and Soto, 1995, Khan et al., 2005, Khan et al., 2012).

It is an acute disease of broiler chickens of 3-5 weeks of age and caused by a group of several viruses which belong to adenoviruses in origin. The disease is characterized Serogelatinous fluids in the pericardial sac (straw colored fluid). The infection results in great economic losses and high mortality rate up to 70% in all age groups of broiler. Characteristically the affected birds show gasping, depression, inability to move, off feed, paleness of wattles and combs alongwith swollen, restlessness, resting of beak pints on the ground and immediate death associated with stress (Irfan et al., 1988, Kumar et al., 2003, Peters et al., 2011). The most prominent features of the disease are dilation of pericardial sac with heavy dropsical fluid and atrophy of the

myocardium. Realizing the importance and heavy economic losses due to hydro-pericardium syndrome among poultry industry, the present study was carried out to record the hematological variation and clinical changes for the confirmation of the disease in naturally infected broiler chickens (Jaffery et al., 1988, Anjum et al., 1989, Rani et al., 2011, Tehrani et al., 2012).

2. AIMS AND OBJECTIVES

- (a) To evaluate the hematological variation of hydro pericardium syndrome infected broilers flocks.
- (b) To record the clinical findings of hydro pericardium syndrome in infected broilers.
- (c) To investigate the heart (pericardial sac) condition during infection.
- (d) To observe the gross pathological lesions in different visceral organs during autopsy.

3. MATERIALS AND METHODS

The present survey was conducted to locate the pockets of hydro pericardium syndrome in broiler flocks during January to June 2012. The valuable information was under taken for the purpose total of 72 broiler farms out of these 30 farms were found infected with hydro pericardium were visited with the interval of 10 days for blood samples randomly collected from ailing birds for the confirmation of hydro pericardium mostly 3-6 weeks of age in the flocks ranging from 1000-3000 at each broiler farms. The broiler flocks which were naturally affected with hydro pericardium were selected for

hematological parameters including (i) Total count (ii) Total leukocytic count (iii) Differential leukocytic count (iv) Haemoglobin concentration (Hb) (v) Erythrocytic sedimentation rate (ESR) (vi) Packed cell volume (PCV) Blood samples of about 3-5 ml were collected from Jugular/wing vein of each diseased bird in a separate sterilized test tube containing sufficient volume of, Anticoagulant "1ml of 1% EDTA" in 5 ml of blood for the purpose of hematological studies. Blood smears were prepared by placing and spreading a small drop of blood at cleaned surface of microscopic glass slides spreader smears then dried, labeled, stained by Geimsas method and was checked by , Digital Optika Microscope's Model. no. B3-4083 Italy (Bhatti et al., 1989).

4. RESULTS

During present research 72 containing population (96,500) broiler chickens were thoroughly surveyed blood samples were collected from the Jugular/ wing veins of naturally infected broilers with Hydro pericardium syndrome and apparently healthy broilers of the same age groups of different poultry flocks around Hyderabad during the entire study period. The blood samples were subjected to (a) total erythrocyte count (b) total leukocyte count (c) hematocrit values (d) erythrocytic sedimentation rate and (e) haemoglobin percentage. The hematological values of different commercial broiler chickens of 3-5 weeks of age affected with hydro pericardium syndrome (HPS).

Table.1. demonstrated that, the mean total erythrocytic count (TEC) was 2.228 ± 0.139 millions/cmm in broilers affected with leukocytic count recorded as 14.5 ± 2.296 in infected flocks. The mean haemoglobin count 6.820 ± 0.327 grams/100ml. Erythrocytic sedimentation rate (ESR) 3.458 ± 0.291 mm/hr. and packed cell volume (PCV) 26.482 ± 0.817 percent were recorded at random in broiler flocks infected with hydro pericardium syndrome (HPS) respectively.

The mean total erythrocytic count (TEC) in normal broilers of various flocks was recorded at random showed 3.11 ± 0.484 millions/cmm. Similarly the mean total Leukocytic count (TLC) was 25.820 ± 0.884 thousands/cmm. Haemoglobin (HB) 10.890 ± 0.427 grams/100ml of blood, erythrocytic sedimentation rate (ESR) 2.340 ± 0.089 and packed cell volume 30.540 ± 0.650 percent, recorded at random in normal broilers of various flocks.

Table.2. revealed that, the mean neutrophils 38.880 ± 1.890 percent, eosinophils 1.004 ± 0.097 percent, Basophils 0.734 ± 0.067 percent, lymphocyte 55.480 ± 2.132 percent and monocytes 3.340 ± 0.270 percent in blood samples; taken at randomly from the infected broiler chickens with (HPS). The mean neutrophils were 33.880 ± 0.311 in percent apparently normal broilers among all different flocks. The mean value of eosinophils was 1.496 ± 0.204 percent, basophils 0.878 ± 0.055 percent, lymphocytes 69.360 ± 0.152 percent and monocytes 4.660 ± 0.598 percent were found in apparently normal broiler birds of different flocks.

Table.1. Hematological values among affected and non-affected broilers with Hydro-Pericardium Syndrome.

S.N	Parameter	Non-affected birds	Affected birds	
		Mean \pm SD	Mean \pm SD	Probability
1	TEC (Million/cmm)	3.11 ± 0.484	2.228 ± 0.139	0.0043
2	TLC (Thousand/cmm)	14.500 ± 2.298	25.820 ± 0.844	0.0000
3	HB (%) (gm/100ml)	10.890 ± 0.427	6.820 ± 0.327	0.0000
4	ESR (mm/Hr.)	2.340 ± 0.089	3.458 ± 0.291	0.0000
5	PCV (%)	30.540 ± 0.817	26.482 ± 0.817	0.0000

Mean Values show significant difference

Table.2: Differential leukocytic count among affected and non-effected broilers with Hydro Pericardium Syndrome.

S. No	Parameter	Non-affected birds	Affected birds	
		Mean \pm SD	Mean \pm SD	Probability
1	Neutrophils	22.880 ± 0.311	38.880 ± 1.800	0.0000
2	Eosinophils	1.496 ± 0.204	1.004 ± 0.097	0.0012
3	Basophils	0.878 ± 0.055	0.734 ± 0.067	0.0060
4	Lymphocytes	69.360 ± 0.152	55.480 ± 2.132	0.0000
5	Monocytes	4.660 ± 0.598	3.340 ± 0.270	0.0020

Mean Values show significant difference

5. DISCUSSION

Hydro pericardium syndrome (HPS) or "Angara disease" is a mysterious disease particularly affecting chickens of 3-5 weeks of age. Hydro pericardium was first reported in commercial broiler flocks at Angara goath near Karachi, Pakistan during August and September, 1987 and gradually spread to the adjoining areas of Karachi (Jaffery et al., 1986). Hydro pericardium syndrome (HPS) inflicts heavy economic losses in millions of rupees and mortality ratio reaches up to 70% and gives constant threat to the poultry industry (Jaffery et al., 1986, Khan et al., 1988, Khan et al., 2005, Khan et al., 2012). The present research was undertaken to record the hematological variation among commercial broiler breeds.

Blood values of broilers infected with hydro pericardium syndrome, the erythrocytes, leukocytes and haemoglobin

concentration were decreased in affected broiler chickens. Among leukocytes, neutrophils were showing marked increase with a relative decrease of lymphocytes, monocytes and eosinophils in ailing broilers. The present study demonstrated significant decrease with exception of leukocytes that, was similar to the finding of (Jaffery et al., 1988, Kumar et al., 2003, Balamurugan and Kataria. 2004) who recorded increase in number of leukocytes along with decrease in lymphocytes and eosinophils in sick birds but was partly coincided to the finding of (Anjum et al., 1989, Khan et al., 2005, Peters et al ., 2011) who observed the certain changes in hematological values.

The significant decrease in the mean total of erythrocytic count, hematological content and hematological values which were detected in broilers affected with hydro pericardium syndromes (HPS) during entire period of the study were in

agreement with the finding of (Bhatti et al., 1989, Borrego and soto. 1995, Rani et al., 2011, Tehrani et al., 2012), who recorded the similar changes in affected broilers with simple variation in blood values which could be due to severe destruction and haemolysis resulted from viral infection in infected broilers.

6. CONCLUSION

It is concluded from current study that, the hydro pericardium syndrome affects the hematological values of broiler chickens; however strict preventive measures should be taken to avoid infection.

DATA statistical analysis M stat - computer software package.

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