

HAEMATOBIOCHEMICAL PICTURES OF HEALTHY HUBBARD CLASSIC BROILER BIRDS

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ABSTRACT

To evaluate the certain haematobiochemical parameters in different ages of Hubbard Classic broiler birds, the study was performed at Kazi Farms Ltd., Gazipur in collaboration with the Department of Physiology, Bangladesh Agricultural University, Mymensingh for a period of one month (1st to 30th March 2002). On haematobiochemical examination, total erythrocyte count, haemoglobin content, packed cell volume, clotting time, glucose and uric acid concentration were gradually increased with advancement of age of birds. The values of TEC, Hb, PCV, clotting time, glucose and uric acid were recorded at day old birds as average 1.23 ± 0.02 million / cmm, 3.90 ± 0.09 g%, 19.60 ± 0.24 %, 37.20 ± 1.50 second, 179.20 ± 8.95 mg / dl and 3.72 ± 0.58 mg / dl respectively while the values at day 30 were 2.43 ± 0.07 million / cmm, 7.26 ± 0.16 g%, 28.20 ± 0.58 %, 206.40 ± 10.17 second, 271.60 ± 8.56 mg / dl and 6.42 ± 0.65 mg / dl respectively which were found statistically significant ($p < 0.01$). On the other hand erythrocyte sedimentation rate, cholesterol and urea concentration were gradually decreased where significantly ($p < 0.05$) higher values (2.80 ± 0.20 mm in 1st hour, 330.40 ± 38.52 mg / dl and 26.42 ± 2.06 mg / dl respectively) were recorded at day old chicks and lower values (1.80 ± 0.37 mm in 1st hour, 104.20 ± 3.24 mg / dl and 17.00 ± 0.07 mg / dl respectively) were recorded at age of 30 days old of birds. The findings of the present work clearly indicate that age has got influential effect on the body haemopoietic system of the broiler birds as well as haematobiochemical values.

Keywords: Broiler, haematological, biochemical, values

INTRODUCTION

Broiler industry has been proved as promising industry and it has given immense priority in fulfilling the increased demand of animal protein. The exotic breed of chicken is now almost well adapted to our hot humid climate. They are also well accepted by the poultry farmers for their higher productivity. Analysis of normal haematobiochemical parameters and its knowledge can be used for assessing the health status of the flock. The haematobiochemical constituents of blood are relatively constant. Fluctuation occurs due to age, sex, breed, climate, geographical locations, nutritional status, seasons and present status of the individual (Dukes, 1955). Erythrocyte and haemoglobin supply oxygen to the body tissues for metabolic activities and carry waste products like carbon dioxide from tissues to lungs (Dukes, 1955). Glucose is the main source of energy in all tissue of the body. So, its deficiency produces debility, emaciation and lowered growth rate (Dickens *et al.*, 1968). Cholesterol is an important metabolic precursor for biosynthesis of the steroid hormones in the gonad and adrenal. So, cholesterol indirectly involves with ovulation, spermatogenesis and sexual maturity (Chung *et al.*, 1965).

The blood values obtained from the study can be used to evaluate the state of health an indispensable preliminary knowledge of the biological material chosen for research. Very limited haematobiochemical studies (Ahmad *et al.*, 1998) have so far been done with exotic breeds in Bangladesh climate condition. The present investigation was therefore carried out to study the normal haematobiochemical parameters of broiler birds (Hubbard Classic) at different age groups.

MATERIALS AND METHODS

The experiment was conducted at Kazi Farms Ltd., Sreepur, Gazipur in collaboration with the Department of Physiology of Bangladesh Agricultural University (BAU), Mymensingh for a period of 1 month from 1st to 30th March 2002. A total of 20, day-old Hubbard Classic broiler chickens were used to study the effect of age on the haematobiochemical parameters namely, total erythrocyte count (TEC), haemoglobin concentration (Hb), packed cell volume (PCV), erythrocyte sedimentation rate (ESR), clotting time, blood glucose, cholesterol, urea and uric acid. The chickens were reared throughout the entire period of study in the well ventilated and protected poultry shed of Kazi Farms Ltd., Gazipur with proper light, space, water supply, sanitation and litter. During the experimental period the birds were maintained with standard broiler starter and finisher feed formulated by Kazi Feed Ltd. as well as vitamin mineral premix supplementation. The routine vaccination was done properly.

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On the particular day of blood collection birds were brought to the physiology laboratory in a well ventilated bamboo boxes to avoid the danger of suffocation. Blood samples were collected aseptically with syringe and needle either from heart or the wing vein or cutting of toe nail from randomly selected five chickens depending on age and then transferred to sterile tubes containing anticoagulant (oxalate solution) at the rate of 1:10 for haematological examinations. All the haematological parameters as TEC, Hb, PCV and ESR were determined as per method described by Shastry (1983).

Recording of clotting time was done by cutting of toe nail for day old chicks and by puncturing the wing vein by a autoclix lancet for other aged chickens. When blood started to come out, a clean and dry glass slide used to take a drop of fresh blood from that place. The clotting time was then recorded in second.

The biochemical parameters like glucose, cholesterol, urea and uric acid were studied using Reflotron autoanalyzer in the Department of Physiology, BAU as per method described by Träsch *et al.* (1984). The blood sample was drawn up using the Reflotron pipette avoiding the inclusion of air and this was applied as a drop to the center of the application zone without allowing the pipette tip to touch the zone. The strip was inserted horizontally into the instrument until hearing a click. Then the biochemical parameters appeared on the display and data were recorded.

Data obtained were subjected to do statistical analysis. The results were expressed in mean, standard deviation and standard error were calculated according to the standard procedures (Snedecor and Cochran, 1980).

RESULTS AND DISCUSSION

The results of TEC, Hb, PCV, ESR, clotting time and of some biochemical (glucose, cholesterol, urea and uric acid) values of the experimental birds are shown in Table 1. Total erythrocyte count, haemoglobin content and packed cell volume increased with the advancement of age and these parameters were significantly ($p < 0.01$) higher at 30 days of age. These findings were similar with the observations made by Dukes (1955), Kundu *et al.* (1993), Prabhakaran *et al.* (1996) and Montes *et al.* (1983). However the erythrocyte sedimentation rate was inversely related to age as day one value was significantly ($p < 0.05$) highest (2.80 ± 0.20 mm in 1st hour) followed lower value on day 10 (2.40 ± 0.24), 20 (2.00 ± 0.00) and 30 (1.80 ± 0.37). Higher ESR at early age in the present finding was correlated with the findings reported by Sturkie (1954). The increase of TEC, Hb and PCV were higher in older than those recorded in youngest chicks whereas the value of ESR was found to be reverse and it might happen that haemopoietic organs were more active and developed in aged birds than the younger and the digestive system become well balanced to absorb proper level of essential nutrients which are essential for erythropoiesis. Blood clotting time was directly related to age.

Table 1. Effect of age on certain haematobiochemical values of Hubbard Classic broiler chickens

S / N	Parameters	Unit	Age (n = 5)			
			Day1	Day10	Day20	Day30
1.	TEC	million / cmm	1.23 ± 0.02^c	1.83 ± 0.03^b	2.34 ± 0.18^a	2.43 ± 0.07^a
2.	Hb	g%	3.90 ± 0.09^c	6.00 ± 0.00^b	7.10 ± 0.29^a	7.26 ± 0.16^a
3.	PCV	%	19.60 ± 0.24^c	22.80 ± 0.73^b	23.60 ± 0.24^b	28.20 ± 0.58^a
4.	ESR	mm in 1 st hr	2.80 ± 0.20^a	2.40 ± 0.24^{ab}	2.00 ± 0.00^b	1.80 ± 0.37^b
5.	Clotting time	Second	37.20 ± 1.50^d	65.60 ± 2.42^c	132.00 ± 2.41^b	206.40 ± 10.17^a
6.	Glucose	mg / dl	179.20 ± 8.95^b	194.20 ± 5.21^b	248.60 ± 16.42^a	271.60 ± 8.56^a
7.	Cholesterol	mg / dl	330.40 ± 38.52^a	125.20 ± 4.07^b	104.80 ± 4.59^b	104.20 ± 3.24^b
8.	Urea	mg / dl	26.42 ± 2.06^a	22.60 ± 1.16^{ab}	22.54 ± 2.60^{ab}	17.00 ± 0.07^b
9.	Uric acid	mg / dl	3.72 ± 0.58^b	3.83 ± 0.54^b	4.91 ± 0.33^{ab}	6.42 ± 0.65^a

Values with different superscript letter(s) differ significantly ($p < 0.01$) within the same row except ESR and urea which were significant at ($p < 0.05$).

Lower values were observed at day old and significantly ($p < 0.01$) higher clotting time with the advancement of age in all the birds observed in the present study which is coincided with the finding of Kundu *et al.* (1993). The possible cause of elevation of clotting time may be due to a reduction of thrombocyte or any other clotting factor and or reduced activities of the liver.

Increased glucose and uric acid concentration were recorded with the advancement of age and significantly ($p < 0.01$) higher at day 30. The present finding of glucose level is in close agreement with the finding of Kundu *et al.* (1993) but contradicts with the finding of Prabhakaran *et al.* (1996) who reported that age of bird had no influence on blood glucose concentration. Uric acid concentration in the present study is supported with the finding of Itoh *et al.* (1995). On the other hand cholesterol and urea values were inversely related to the advancement of age and all the difference were significant ($p < 0.05$). The cholesterol level in the present study showed a negative correlation with the age. This might be due to excess storage of cholesterol in the yolk sac. The present finding was correlated with the finding of Dellomo and Cavallina (1996) who reported that the cholesterol values were decreased with the advanced of age in Egyptian vultures but Furlan *et al.* (1999) reported that blood glucose, cholesterol and uric acid were not affected by age or strain.

Although the present study was limited with few haematobiochemical parameters it may be concluded that the age of the birds has effect on their haematobiochemical parameters.

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