

Gross morphometrical study on bursa of Fabricius in developing bronze turkey

(*Meleagris Meleagris Gallopavo*)

Georgi Penchev



Department of Veterinary Anatomy, Histology and Embryology, Faculty of Veterinary Medicine, Trakia University, 6000 Stara Zagora, Bulgaria
Corresponding author: Georgi Penchev, Department of Veterinary Anatomy, Histology and Embryology, Faculty of Veterinary Medicine, Trakia University, 6000 Stara Zagora, Bulgaria, e-mail: georgi_pnchv@yahoo.com

Abstract

The aim of the study was evaluation of the age related development of the bronze turkey's bursa of Fabricius. The obtained data gave information about the standard actual values of the metric parameters in the investigated organ. The bursa of sixty healthy clinically bronze turkeys (thirty males and thirty females) was studied metrically by ruler, graph paper and automatic weighter. The birds were distributed in ten age related groups at the 1st, 7th, 14th, 28th, 35th, 49th, 56th, 90th, 120th and 240th days of age. Each group consisted of six turkeys. The absolute and relative weight and length of the organ were determined. The experiments were made in strict compliance with the Institutional Committee of Animal Health Care. During the period the absolute weight of the bronze turkeys' bursa increased by 76.50 times, the absolute length-3.5 times. The relative weight of the organ was with highest values at the 7th day of age. Their relative length reached peak values at the 1st day.

Introduction

Macromorphometric data of domestic birds' bursa of Fabricius are based on extensive comparative studies. It appears as a dorsal median diverticulum of the proctodeum, being globular in shape. When the organ is fully developed, it consists of a wall surrounding a small, axial main cavity. The main cavity gives off small diverticula, and also leads into the cloaca through a small median opening in the dorsal wall of the duodenum. The wall is divided into many folds. Each fold consists of numerous lobules (follicles). Lobules' cortex contains many lymphocytes, while in the medulla they are fewer. The bursa is involved in the synthesis of circulating antibody to a primary antigenic stimulus.

Aim

The aim of the study was evaluation of the age related development of the bronze turkey's bursa of Fabricius.

Materials and methods

The bursas of sixty healthy clinically bronze turkeys (thirty males and thirty females) were studied metrically by ruler, graph paper and automatic weighter. The birds were distributed in ten age related groups at the 1st, 7th, 14th, 28th, 35th, 49th, 56th, 90th, 120th and 240th days of age. Each group consisted of six turkeys. The absolute and relative weight and length were determined. The experiments were made in strict compliance with the Institutional Committee of Animal Health Care.

Results

During the period the relative weight of the bronze turkeys' bursa increased to 28th day, as peak values were at 14th day. During the period from 28th to 56th day this index is with constant values, close to the maximum values. After 56th day the relative weight decreased.

The relative length of the organ was with peak values at the 1st day of age. Constant values of this parameter were detected during the period from 28th to 56th day. After 49th day the relative length decreased.

Similar variations of transversal diameter and perimeter's values were observed at the same age periods. At 240th day the bursas was reduced to a tiny saccule a few millimeters long, hidden in the connective tissue of the cloaca dorsal part. Involution was detected with onset of sexual maturity.

age (days)	Absolute parameters				body weight (g) x ± SD
	weight (g) x ± SD	length (mm) x ± SD	perimeter (mm) x ± SD	diameter (mm) x ± SD	
1	0.06±0.01	8.83±0.75	11.50±0.83	3.37±0.51	50.76±3.14
7	0.15±0.02	11.83±1.60	17.83±0.98	5.33±0.51	77.43±1.53
14	0.34±0.02	15.66±0.81	21.02±0.89	7.07±0.63	125.57±2.56
28	0.85±0.01	18.16±0.75	29.33±1.63	11.34±0.51	347.37±13.86
35	0.96±0.02	23.02±1.09	32.07±0.63	12.33±0.56	433.83±12.02
49	1.15±0.02	23.50±0.54	32.38±0.51	14.54±0.83	489.94±11.89
56	2.31±0.24	24.16±0.98	32.51±1.04	15.16±0.75	1102.52±97.41
90	3.74±0.07	25.66±0.51	33.16±1.169	17.39±0.81	2493.74±51.03
120	3.98±0.06	27.50±0.54	34.31±0.51	19.52±0.54	3089.16±86.39
240	4.65±0.46	30.58±0.54	35.52±0.547	20.19±0.75	4964.5±144.37

age (days)	Relative parameters				body weight (g) x ± SD
	weight (g) x ± SD	length (mm) x ± SD	perimeter (mm) x ± SD	diameter (mm) x ± SD	
1	0.12±0.01	17.83±0.75	23.08±0.83	6.74±0.51	50.76±3.14
7	0.19±0.01	15.83±0.60	23.13±0.88	6.92±0.41	77.43±1.53
14	0.27±0.03	12.66±0.71	16.82±0.79	5.65±0.23	125.57±2.56
28	0.24±0.01	5.26±0.75	8.43±1.23	3.24±0.48	347.37±13.86
35	0.23±0.02	5.30±0.09	7.40±0.63	2.84±0.46	433.83±12.02
49	0.22±0.02	4.80±0.59	6.62±0.51	2.94±0.83	489.94±11.89
56	0.21±0.04	2.16±0.78	1.37±0.54	15.16±0.75	1102.52±97.41
90	0.15±0.04	1.02±0.51	1.33±0.16	1.39±0.72	2493.74±51.03
120	0.12±0.02	0.89±0.50	1.11±0.31	0.69±0.04	3089.16±86.39
240	0.09±0.01	0.61±0.57	0.72±0.04	0.41±0.05	4964.5±144.37

Conclusion

The obtained results gave a motivation to make the conclusion that the development of the bronze turkey bursa weight and length were highest from hatching to the sexual maturity. At the beginning of sexual maturity's period, the organ demonstrated lowest morphometrical parameters.