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Gross Structure and Biometry of Ovary in Kadaknath and White Leghorn Breeds of Fowl

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Abstract

A Gross morphologic and biometric study was conducted on ovaries of a total 72 female chicks/growers, 36 each of Kadaknath and White Leghorn (WLH) breeds. The birds were grouped according to age into 6 (I-VI) groups, viz., 1, 4, 8, 12, 16 and 20 weeks old. The gross observations revealed that the left ovary was elongated triangular with base directed rostrally and conical apex caudally in all the groups of Kadaknath and WLH, except in age group V and VI of WLH. The mean weight of the ovary in age group I was 0.08±0.01g and 0.08±0.18 g, which increased to 0.31±0.04 g and 21.17±2.29 g in Kadaknath and WLH, respectively. The mean length of ovary in Kadaknath was 0.68±0.03 cm in age group I, which increased to 2.02±0.09 cm in age group VI. The mean length of ovary was slightly more in WLH than Kadaknath group I, which became more than twice in age group VI.

Key Words: Biometry, Chicks/Grower, Kadaknath, Morphology, Ovary, White Leghorn.

Introduction

Madhya Pradesh has one well known native breed of fowl named as Kadaknath (Pride bird of MP). Original name of breed is Kalamansi meaning a fowl with black flesh. Most of the internal organs show intense black coloration, blood is darker than the mammalian blood (Panda and Mahapatra., 1989). However, their egg production is less and ranges between 80 and 90 per year with egg weight of 49 g (Pathan*et al.,* 2009). White leghorn (WLH) is the native breed of Italy. White Leghorn birds are the best known egg producing breed of fowl averaging between 300 and 330 eggs per year with egg weight of 50 to 55 g. Production of egg is relatedwith the reproductive system and regulated by several complex interactions. This relationship was studied in exotic breeds of fowl (Swain *et al.,* 2000; Surai, 2002). Comparative studies on ovaries of Aseel and RIR(Rhode Island Red) fowl aging from 2 weeks to 13 months were conducted by Shyam*et al.* (2015). However, such information was lacking in Kadaknath and WLH breeds of fowl. Therefore, the present study was undertaken to evaluate the gross features of ovaries during post-hatch period in Kadaknath and WLH breeds of fowl.

Materials and Methods

The study was conducted on gross and histo-morphological observations and biometry of female

reproductive system of 72 chicks/growers, 36 each of Kadaknath and White Leghorn breed. These chicks/growers were divided into six age groups, viz., group I (1 week), group II (4 week), group III (8 week), group IV (12 week), group V (16 week) and group VI (20 week). The Kadaknath chicks were procured from AICRP on Poultry, Livestock Farm,Adhartal, Jabalpur. WLH chicks were collected from Phoenix Poultry Farm, Jabalpur. Gross observations were made on length, width (cm) and weight (g) of left ovary and data were analyzed statistically.

Results and Discussion

The gross observations revealed that the left ovary was elongated triangular with base directed rostrally and conical apex caudally in all the groups of Kadaknath and WLH, except in age group V and VI of WLH. . The present observations concurred with reports of King and McLelland (1975) and Ingole (1985). In later groups due to presence of number of mature follicles the left ovary became in the form of bunch of grapes (Fig. 3). The colour of the ovary in Kadaknath was grayish; however in WLH, it was pinkish white to yellow. The surface of the ovary was smooth upto age group III in Kadaknath whereas; in WLH the surface became uneven in age group III. King and McLelland (1975) reported that at the age of 2 to 8 weeks, the ovarian surface developed irregular contours with transverses ridges separated by grooves of varying depth.The ovarian follicles were not grossly visible in any of the age groups of Kadaknath; however in WLH, the growth of follicles was clearly differentiated in age group V and VI (Fig.3).

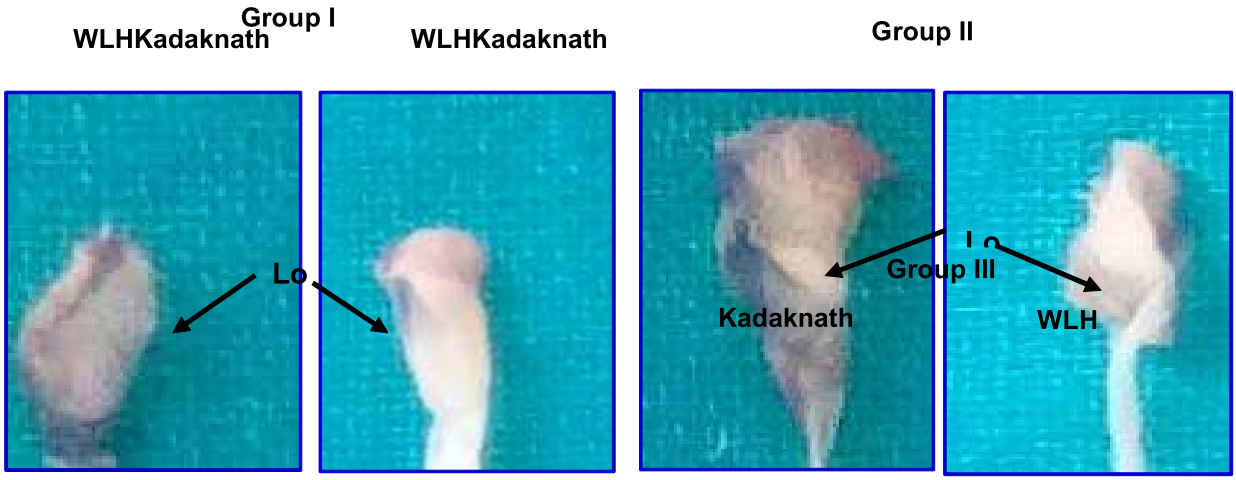

Fig. 1:Photograph showing left ovary (Lo) of Kadaknath and WLH in group I & II

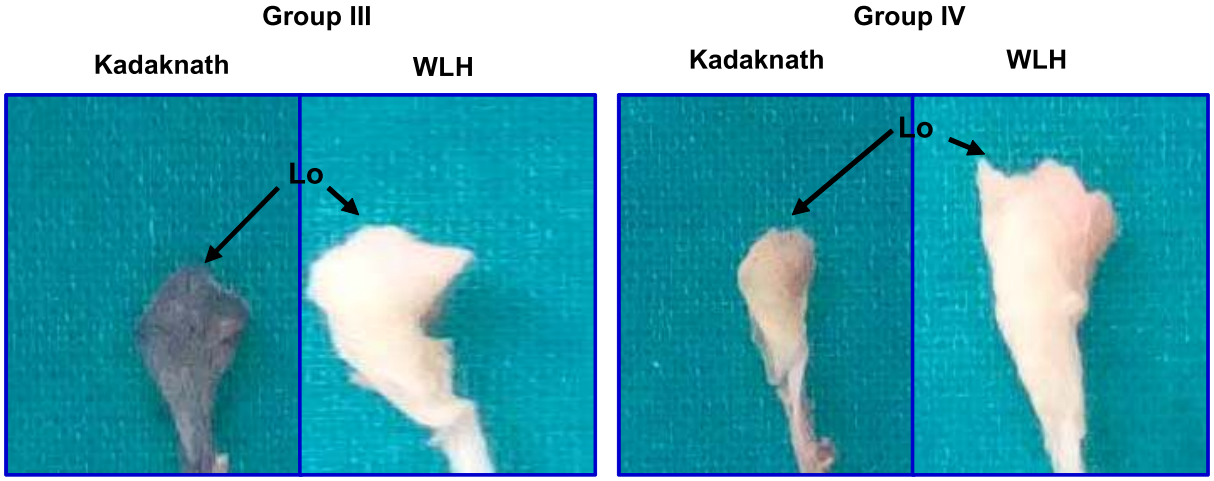

Fig. 2: Photograph showing left ovary (Lo) of Kadaknath and WLH in group III & IV

Table 1 : Biometrical measurements of left ovary of Kadaknath and White Leghorn breeds of fowl at different age groups.

Parameters		Kadaknath						White Leghorn					
		Groups											
		I (1 wk)	II (4 wk)	III (8 wk)	IV (12 wk)	V (16 wk)	VI (20 wk)	I (1 wk)	II (4 wk)	III (8 wk)	IV (12 wk)	V (16 wk)	VI (20 wk)
Ovary weight (g)	**Range**	0.070-0.10	0.14-0.18	0.15-0.25	0.19-0.33	0.23-0.35	0.29-0.47	0.07-0.10	0.15-0.19	0.27-0.34	0.48-0.67	0.980-16.21	15.57-29.00
	Mean±SE	0.08±0.10	0.16±0.05	0.17±0.06	0.23±0.20	0.28±0.19	0.31±0.04	0.08±0.18	0.17±0.06	0.31±0.14	0.54±0.12	12.12±1.61	21.17±2.29
Body weight (kg)	**Range**	0.055-0.070	0.175-0.185	0.270-0.340	0.395-0.470	0.650-0.710	0.690-0.750	0.064-0.075	0.180-0.190	0.480-0.510	0.850-0.900	1.050-1.160	1.290-1.350
	Mean±SE	0.060±0.03	0.180±0.07	0.300±0.01	0.430±0.07	0.680.±0.01	0.720±0.04	0.070±0.03	0.190±0.02	0.490±0.04	0.870±0.01	1.100±0.02	1.320±0.01
Length of synsacrum (cm)	**Range**	2.60-2.90	3.50-3.80	4.50-4.90	5.00-5.40	6.80-7.00	6.90-7.30	2.70-3.10	3.20-3.50	5.00-5.30	6.30-6.80	7.80-8.40	9.00-9.30
	Mean±SE	2.73±0.04	3.65±0.04	4.72±0.06	5.22±0.07	6.85±0.06	7.07±0.07	2.90±.006	3.38±0.06	5.12±0.05	6.58±0.12	8.10±0.09	9.08±0.06
%, left ovarian weight to body weight	**Range**	0.12-0.13	0.08-0.09	0.05-0.05	0.04-0.05	0.03-0.04	0.04-0.05	0.11-0.12	0.06-0.09	0.06-0.07	0.06-0.08	1.08-1.14	1.35-1.72
	Mean±SE	0.13±0.12	0.09±0.06	0.05±0.08	0.0560.13	0.04±0.10	0.04±0.17	0.11±0.09	0.09±0.15	0.061±0.13	0.07±0.05	1.10±0.07	1.64±0.11
Length (cm)	Range	0.60-0.80	1.00-1.30	1.30-1.60	1.30-1.70	1.70-2.00	1.80-2.40	0.70-0.90	1.10-1.30	1.30-1.70	1.80-2.70	2.30-4.50	3.50-5.50
	Mean±SE	0.68±0.03	1.13±0.04	1.47±0.05	1.52±0.06	1.84±0.05	2.02±0.09	0.77±0.03	1.22±0.03	1.56±0.08	2.14±0.06	3.52±0.34	4.77±0.36
Width (cm)	Range	0.40-0.60	0.70-0.90	0.90-1.10	0.90-1.20	0.90-1.20	1.00-1.30	0.40-0.60	0.60-0.90	0.80-1.20	1.20-1.60	2.10-3.6.0	2.40-4.20
	Mean±SE	0.48±0.03	0.75±0.06	1.02±0.02	1.07±0.05	1.10±0.09	1.13±0.07	0.50±0.04	0.73±0.07	1.08±0.05	1.37±0.08	2.95±0.12	3.28±0.25

Fig. 3: Photograph showing left ovary (Lo) of Kadaknath and WLH in group V & VI

The left ovary was related to the cranial division of the left kidney dorsally in all the groups of Kadaknath, however, in WLH it was related to right kidney in age group V and VI. The aorta, caudal vena cava and right adrenal gland were also related to the dorsal aspect of left ovary. The length of synsacrum occupied by the female genital tract was maximum in age group VI of both of the breeds. The percentage left ovary weight to body weight was greater in age group V and VI of WLH; however in Kadaknath, it was more in age group I and II (Table 01).

The mean weight of the ovary in age group I was 0.08±0.01g and 0.08±0.18 g, which increased to 0.31±0.04 g and 21.17±2.29 g in Kadaknath and WLH, respectively in age group VI. King and McLleland (1975) also reported the weight of ovary similarly to the Kadaknath ovary in 4 month of chicken. However, Shyam *et al.* (2015) observed ovaries of Aseel and RIR fowl in 2 weeks , 5 months and 13 months of age and observed that the mean weight of ovary in 2 weeks, 5 months and 13 months was 0.03g, 0.52 g, 18.04 g in Aseel and ,04 g, 0.97 g, 18.07 g in RIR, respectively. Growth spurt of the length, width and weight of left ovary was maximum from age group I to II in Kadaknath, however, in WLH the maximum value showed in age group IV to V. The per cent of left ovary weight to body weight was maximum (0.13±0.12 %) in age group I of Kadaknath, whereas, in WLH this value was maximum (1.64±0.11 %) in age group VI.

The mean length of ovary in Kadaknath was 0.68±0.03 cm in age group I, which increased to 2.02±0.09 cm in age group VI. In WLH the mean length of ovary was slightly more in age group I which became more than twice in age group VI. Similarly mean width of ovary in Kadaknath and WLH was approximately equal, i.e. 0.48±0.03 cm and 0.50±0.04 cm, respectively, in age group I and became more than twice in age group VI in WLH (Table 01). The right ovary was not appreciable in any of the groups of Kadaknath and WLH breeds in the present study.

References :

Ingole, S.N. (1985). Late pre and post hatch developmental studies of female reproductive system in Narmada-XL (Dwarf) and Normal WLH Birds. *MVSc& AH thesis (Anatomy)*, Jawaharlal Nehru KrishiVishwaVidyalaya, Jabalpur, India.

King, A.S. and Mclelland, J. (1975).*Outlines of Avian Anatomy*. Bailliere Tindall, London, pp. 65-73.

Panda, B. and Mohapatra, S.C. (1989). Poultry Production. ICAR, New Delhi, pp 17-18.

Pathan, R.K., Bhide, A.R., Rangnekar, D.V. and Ambekar, J.D. (2009). Reviving the indigenous poultry breed Kadaknath: Enhancing livelihoods of tribals through niche market opportunities. http://www.sapplpp.org/Good Practice/ingp04 .

Shyam, K., Ingole, S.P., Chaurasia, D., Sinha, B. and Nag, D. (2015). Gross study of ovary of Assel and Rhode Island Red fowl. *Proc. XXIX Annual Convention of Indian Association of Anatomists and National Symposium*, held from 11- 13 February,2015 at ChattisgarhKamdhenuVishwavidyalya, Durg, Chattisgarh,India,p. 132.

Surai, P.F. (2002). Selenium on poultry nutrition, antioxidants properties, deficiency and toxicity.*World's Poultry Sci. J.*,**58**: 333-364.

Swain, B.K., Johari, T.S. and Majumder, S. (2000). Effect of supplementation of vitamin E and selenium and their different combination on the performance and immune response of broilers. *Broilers Poultry Sci,*,**41**: 287-292.

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