



E-ISSN: 2320-7078

P-ISSN: 2349-6800

www.entomoljournal.com

JEZS 2020; 8(5): 623-625

© 2020 JEZS

Received: 10-07-2020

Accepted: 12-08-2020

N Dahariya

Department of Veterinary
Anatomy and Histology, CVSc.
and A.H., OUAT, Bhubaneswar,
Odisha, India

S Sathapathy

Department of Veterinary
Anatomy and Histology, CVSc.
and A.H., OUAT, Bhubaneswar,
Odisha, India

UK Mishra

Department of Veterinary
Anatomy and Histology, CVSc.
and A.H., OUAT, Bhubaneswar,
Odisha, India

R Patra

Department of Veterinary
Anatomy and Histology, CVSc.
and A.H., OUAT, Bhubaneswar,
Odisha, India

S Dehury

Department of Veterinary
Anatomy and Histology, CVSc.
and A.H., OUAT, Bhubaneswar,
Odisha, India

SK Joshi

Scientist (Animal Science), KVK,
Jharsuguda, OUAT,
Bhubaneswar, Odisha, India

SK Sahu

Department of Veterinary
Anatomy and Histology, CVSc.
and A.H., OUAT, Bhubaneswar,
Odisha, India

L Samal

AICRP on Poultry Breeding,
CVSc. and A.H., OUAT,
Bhubaneswar, Odisha, India

Corresponding Author:**S Sathapathy**

Department of Veterinary
Anatomy and Histology, CVSc.
and A.H., OUAT, Bhubaneswar,
Odisha, India

Gross morphological and biometrical studies on the spleen in various chicken genotypes

N Dahariya, S Sathapathy, UK Mishra, R Patra, S Dehury, SK Joshi, SK Sahu and L Samal

Abstract

Hansli chicken is especially reared in Mayurbhanj district and in some parts of its nearby districts like Keonjhar of Odisha. They play a vital role in the economic upliftment of poor, landless and marginalised section of the people in the rural areas besides providing them with nutritious egg and meat for consumption. A total number of eighteen day old Hansli chicks and eighteen day old Vencobb broiler chicks were divided into three age groups viz. group I (up to 1 month), group II (1-3 months) and group III (3-6 months) with six birds in each age group. On each observation day (4th week, 12th week and 24th week), six birds from each breed were used for the study of gross morphological and gross morphometrical features of the spleen. It was found that the spleen in both the birds was almost triangular in shape, dark-reddish in colour having rounded edges which was situated on the right side of the junction between the proventriculus and gizzard in both the birds. The average weight of the spleen was found to be 4.7 ± 0.11 gm in Hansli chicken at 12th week of age that was significantly ($p \leq 0.05$) less than the average weight of spleen in Vencobb broiler chicken at this age, where it was measured as 5.2 ± 0.16 gm. Further, the average size and weight of the spleen increased with age in both the birds. The present study provided a detailed baseline data on the age wise development of spleen in Hansli chicken and Vencobb broiler chicken which could be used in future research in other breeds of birds.

Keywords: Hansli, morphology, biometry, spleen, Vencobb

Introduction

The organized poultry sector contributes about 70 per cent of the total output of poultry industry and the remaining 30 per cent is shared by the unorganized sector [1]. The indigenous breeds of chickens mostly contribute to the rural economies in most of the underdeveloped and developing countries like India. The environment rural relations and demand of food safety in recent years might encourage the use of native fowl in a gastronomical niche market [3]. Besides, providing nutritious chicken egg and meat for consumption, the native fowl play an incredible role in giving the subsidiary income to the rural poor and marginalized section of the people in our country [8]. The Hansli chicken is especially reared in Mayurbhanj district and in some parts of its nearby districts like Keonjhar of Odisha [7]. The Hansli chicken is very well adapted to the hot and humid tropical climates of Odisha and has been mainly reared for meat, egg and game purpose.

The basic structures of the lymphoid organs pave the way to understand their physiology and their age. The basic structures of the lymphoid organs pave the way to understand their physiology and their role in providing immunity. Several works have been reported on the lymphoid system of broiler chicken [5], domestic chicken [4], Japanese quail [9] and turkey [2] has been done, but very scarce literature is available on the lymphoid system of Hansli chicken and Vencobb broiler chicken till date. Viewing the increased popularity of the Hansli chicken and Vencobb broiler chicken in Odisha, the present study is carried out on the gross morphological and morphometrical development of spleen in these breeds with age.

Materials and Methods

A total number of eighteen day old Hansli chicks and eighteen day old Vencobb broiler chicks were purchased from Mayurbhanj district and Eastern Hatcheries Pvt. Ltd., Bhubaneswar, Odisha (A subsidiary of Venkateswara Hatcheries Group, Pune) respectively to study the post-hatched development of spleen. The birds (Hansli chicken and Vencobb broiler chicken) were divided into three age groups viz. group I (up to 1 month), group II (1-3 months) and group III

(3-6 months) with six birds in each age group. On each observation day (4th week, 12th week and 24th week), six birds from each breed were used for the study of gross morphological and gross morphometrical features of the spleen. The different biometrical parameters of the organs were recorded with the help of weighing machine, graduated tape, scale and digital Vernier's calliper. The recorded data were subjected to routine statistical analysis as per the standard methods given by Snedecor and Cochran [10] and independent samples t-Test with Systat Software Inc, USA and SPSS 16.0 version software.

Results and Discussion

(i) Gross Morphology

The spleen was almost triangular in shape with rounded edges and dark-reddish in colour in both Hansli chicken and Vencobb broiler chicken (Fig.1, Fig. 2 and Fig. 3). It was present on the right side of the junction between the proventriculus and gizzard which was similar to the reports of Mahanta [6] in local hill fowl of Uttarakhand and RIR.

(ii) Biometrical observations

The average weight of the spleen was found to be 1.1 ± 0.03 gm, 4.7 ± 0.11 gm and 5.6 ± 0.12 gm in Hansli chicken at 4th week, 12th week and 24th weeks of age respectively. Similarly, the average weight of the spleen was measured as 0.31 ± 0.02 gm, 5.2 ± 0.16 gm and 6.1 ± 0.18 gm in Vencobb broiler chicken at 4th week, 12th week and 24th weeks of age respectively. Further, the difference in the average weight of the spleen was found to be significant ($p \leq 0.05$) in 12th week of age between the birds. The average volume of spleen was found to be 0.55 ± 0.07 cc, 2.3 ± 0.11 cc and 3.9 ± 0.16 cc in Hansli chicken at 4th week, 12th week and 24th weeks of age respectively. Similarly, the average volume of spleen was measured as 0.75 ± 0.08 cc, 2.9 ± 0.12 cc and 4.8 ± 0.22 cc in Vencobb broiler chicken at 4th week, 12th week and 24th weeks of age respectively.

The average longitudinal diameter of spleen was found to be 0.38 ± 0.01 cm, 0.48 ± 0.01 cm and 1.2 ± 0.10 cm in Hansli chicken at 4th week, 12th week and 24th weeks of age respectively. Similarly, the average longitudinal diameter of spleen was measured as 0.41 ± 0.02 cm, 0.79 ± 0.02 cm and 1.4 ± 0.13 cm in Vencobb broiler chicken at 4th week, 12th week and 24th weeks of age respectively. Further, the difference in the average longitudinal diameter of spleen was found to be significant ($p \leq 0.05$) in 12th week of age between the birds. The average transverse diameter of spleen was found to be 0.26 ± 0.02 cm, 0.34 ± 0.009 cm and 0.51 ± 0.02 cm in Hansli chicken at 4th week, 12th week and 24th weeks of age respectively. Similarly, the average transverse diameter of spleen was measured as 0.32 ± 0.01 cm, 0.45 ± 0.02 cm and 0.60 ± 0.01 cm in Vencobb broiler chicken at 4th week, 12th week and 24th weeks of age respectively. The average thickness of spleen was found to be 0.22 ± 0.01 cm, 0.30 ± 0.01 cm and 0.48 ± 0.02 cm in Hansli chicken at 4th week, 12th week and 24th weeks of age respectively. Similarly, the average thickness of spleen was measured as 0.25 ± 0.01 cm, 0.47 ± 0.005 cm and 0.59 ± 0.002 cm in Vencobb broiler chicken at 4th week, 12th week and 24th weeks of age respectively.

The morphometrical data could not be compared due to availability of scanty literature in this field.



Fig 1: Photograph showing left and right thymus, spleen and bursa of Fabricius of Hansli chicken (4th week)



Fig 2: Photograph showing spleen (arrow) of Vencobb broiler chicken (4th week)



Fig 3: Photograph showing Spleen (arrow) of Hansli chicken (12th week)

Conclusion

The present study provided a detailed baseline data on the age wise development of spleen in Hansli chicken and Vencobb broiler chicken which could be correlated with various molecular techniques in characterization of the age related immunogenic potency of these two breeds of poultry.

Acknowledgements

The authors are grateful to the Dean, CVSc. and A.H., OUAT, Bhubaneswar for providing necessary facilities and support for the successful completion of this research work within time. The authors are grateful to Dr. S.K. Joshi, Scientist (Animal Science), KVK, Jharsuguda, OUAT for statistical analysis of the biometrical data.

References

1. Ali MM. Emerging prospective of emerging Indian livestock: A study on poultry sector. *Asian Journal of Management Sciences*. 2015; 4(3):33-39.
2. Ali HK. Anatomical and histological study of thymus gland in the local breed of Turkey (*Meleagris gallopavo*) in Iraq. 3rd Scientific Conference, College of Veterinary Medicine, University of Tikrit, 2016.
3. Ekka R, Behura NC, Samal L, Nayak GD, Pati PK, Mishra PK. Growth performance and linear body measurements of Hansli, CSML and Hansli×CSML cross under intensive system of rearing. *Journal of Livestock Science*. 2016; 7:114-121.
4. Kannan TA, Geetha R, Ushakumari S, Dhinakarraj G, Vairamuthu S. Light microscopic studies on Spleen of Chicken (*Gallus domesticus*). *Haryana Veterinarian*. 2015; 51(12):114-5.
5. Khan MZI, Masum M, Zubayer M, Khan I, Aziz ARB, Nasrin M *et al*. Histomorphology of the lymphoid tissues of broiler chicken in Kelantan, Malaysia. *Sains Malaysiana*. 2014; 43(8): 1175-1179.
6. Mahanta D. Comparative study on the major lymphoid organs of local hill fowl of Uttarakhand and Rhode Island Red. M.V.Sc. Thesis submitted to G.B. Pant Univ. Agri. and Tech., Pantnagar, 2018.
7. Mohapatra SC, Mishra SC, Das K. Poultry Genetic Resources of Orissa (ISNNRMPO Programme Series 4), Published by Intercorporation India-Deligation, Hyderabad and Indo-Swiss Natural Resources Management Programme, Orissa, Bhubaneswa, 2016, 1-58.
8. Padhi MK. Importance of indigenous breeds of chicken for rural economy and their improvements for higher production performance. *Scientifica*. 2016, 9.
9. Senapati MR, Behera PC, Maity A, Mandal AK. Comparative histomorphological study on the thymus with reference to its immunological importance in Quail, Chicken and Duck. *Explorative Animal and Medical Research*. 2015; 5(1):73-77.
10. Snedecor GW, Cochran WG. In "Statistical methods" 8th Edn., Oxford and IBH Publishing House, Calcutta, India, 1994.