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Short Communication

STATISTICAL ANALYSIS ON HISTOLOGY OF THYMUS IN DIFFERENT AGE GROUP OF KADAKNATH BREED

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ABSTRACT
The study was conducted on thirty specimen of thymus of Kadaknath birds from day old to twenty six weeks old. Formalin fixed samples were processed by routine paraffin embedding technique and subjected to statistical analysis. The thickness of cortex from group-I to V was statistically significant (P<0.05) and thickness of medulla from group-I to V was statistically highly significant (P<0.01). Thickness of cortex were increased from group-I to IV then decreased in group-V while Thickness of medulla were increased significantly from group-I to group-V. In comparison of diameter of lymphocytes in cortex as well as medulla from group-I to V were statistically insignificant. There were no changes in diameter of lymphocytes in cortex and medulla within groups. The length as well as width of Hassall's corpuscles were statistically highly significant (P<0.01). The length and width of Hassall's corpuscles were increased significantly from group-I to group-V indicated that increased thickness and width contributes activeness of thymus in that age.

KEYWORDS: Kadaknath, Thymus, Micrometry, Histology, Age.

INTRODUCTION

The Kadaknath is Indian breed of poultry local to the Malwa region of Madhya Pradesh. The Kadaknath is popular mainly meat for its adaptability and good testing meat. The flesh of these birds though black and repulsive to look at, is considered not only delicacy but also of medicinal value (Pandey *et al*. 2002). The lymphoid tissues play an important role in the defense against all pathogen. The chicken has central (Thymus and bursa of Fabricius) and peripheral (spleen and all mucosa associated lymphoid tissue) lymphoid tissues. The lymphoid system of chicken consists of unique organs and divided into two morphologically and functionally distinct components. Thymus is located on parallel to the vagus nerve and internal jugular veins (Khan *et al*. 2014). On each side of the neck there are 6-8 separate lobes, extending from the third cervical vertebra to the upper thoracic segments. The thymus-dependent component is represented by the smaller lymphocytes and is responsible for cell mediated immunity, including immunosurveillance (Akter *et al*. 2006).

MATERIALS & METHODS

Thirty healthy Kadaknath birds of both sexes with five different age groups were used for this study. Each group was comprised of six birds. These birds were sacrificed ethically and glands were fixed immediately in 10% neutral buffer formalin for 24 hours. Fixed thymus were processed by routine paraffin embedding technique and paraffin sections of 5 to 7 µ were subjected for statistical study. The sections were stained with hematoxyline and eosin stain (Singh and Sulochana, 1997) and different parameter were recorded and analyzed by (One Way ANOVA) and the significance (P value) of the test was recorded at 5% or 1% level (Snedecor and Cochran, 1994).

RESULTS & DISCUSSION

Histologically the thymus of Kadaknath was encapsulated by thin connective tissue capsule along with adipose tissue. From connective tissue, septae arised entered into lobes dividing them into lobules, along with septae, blood vessels and nerve also entered into lobules. The thymus showed more lobulation with outer dark cortex, filled with lymphocytes and inner light medulla formed of large lymphocytes with centrally placed nuclei and acidophilic cytoplasm. Thickness of cortex was statistically significant (P<0.05). Thickness of cortex was 242.33 ± 12.64µm in group-I followed by 320.5 ± 5.57µm in group-II, 411.66 ± 23.43µm in group-III, 416.6 ± 69.19µm in group-IV and 265 ±26.54µm in group-V. These measurements of thickness in other birds are not available in literature. Thickness of medulla was statistically highly significant (P<0.01). Thickness of medulla was 247 ± 11.71µm in group-I followed by 300.5 ± 6.46µm in group-II, 368.33 ± 14.75µm in group-III, 431.6 ± 40.678µm in group-IV and 472.1 ± 12.863µm in group-V, similar finding by Haseeb *et al*. (2014). These results differ by Khenenou *et al*. (2012) they observed that at second week the lobules continue their development and increase in size to reach the maximum; the length was 219±10.35µm and the width is about 158.6±8.69µm. The diameter of lymphocytes in cortex and medulla were observed insignificantly. The diameter of lymphocytes in cortex were 4.17 ± 0.07µm in group-I followed by 4.21 ± 0.06µm in group-II, 4.31 ± 0.42µm in group-III, 4.36 ± 0.01µm in group-IV and 4.36 ± 0.116µm in group-V. The diameter of lymphocytes in medulla were 4.79 ± 0.23µm in group-I followed by 4.38

± 0.042µm in group-II, 4.64 ± 0.15µm in group-III, 4.74 ± 0.11µm in group-IV and 4.74 ± 0.12µm in group-V. These results were differ from Gulmez and Aslan (1999) in native geese who reported that the diameter of lymphocytes in cortex and medulla were observed statistically significant and minimum, mean and maximum diameter of lymphocytes in cortex 2.01µ, 3.80±0.08µ and 6.02µ, respectively and minimum, mean and maximum diameter of lymphocytes in medulla 2.0µ, 4.10±0.08µ and 6.02µ, respectively.

The length and width of Hassall's corpuscles were statistically highly significant (P<0.01). The length of Hassall's corpuscles were 4.40 ± 4.45µm group-I followed by, 20.185 ± 3.479µm in group-II, 21.48 ± 2.18µm in group-III 28.32 ± 4.65µm in group-IV and 34.50 ± 3.7µm in group-V respectively. The width of Hassall's corpuscles were 5.56 ± 5.45µm in group-I followed by 26.816 ± 2.158µm in group-II, 30.17 ± 3.75µm in group-III, 31.65 ± 4.14µm in group-IV and 46.46 ±5.70µm in group-V respectively. The measurements of length and width of Hassall's corpuscles in other birds are not available in literature. The function of Hassall's corpuscles is unknown.

TABLE 1: Statistical analysis of micrometrical measurement of different parameters of thymus gland (Mean ±SE)
Mean bearing different superscript within row differs highly significantly

S. No.	Parameter	Group 1	Group 2	Group 3	Group 4	Group 5
1	Diameter of cortex(µm)*	242.33±12.64^{b}	320.5±5.57^{ab}	411.66±23.43^{a}	416.6±69.19^{a}	265±26.549^{b}
2	Diameter of medulla(µm)**	247± 11.71^{c}	300.5±6.46^{c}	368.33±14.75^{b}	431.6±40.678^{a}	472.1±12.863^{a}
3	Diameter of lymphocytes in cortex (µm)^{NS}	4.17±0.07	4.21±0.06	4.31±0.42	4.36±0.01	4.36±0.116
4	Diameter of lymphocytes in cortex medulla (µm)^{NS}	4.79±0.23	4.81±0.042	4.64±0.15	4.74.±0.11	4.74±0.12
5	Length of Hassall's corpuscles (µm)**	4.40±4.45^{c}	26.816±2.158^{b}	30.17±3.7^{b}	31.65±4.14^{b}	46.46±5.70^{a}
6	Width of Hassall's corpuscles (µm)**	5.56±5.45^{c}	20.185±3.479^{b}	21.48±2.18^{b}	28.32±4.65^{ab}	34.50±3.7^{a}

**= highly significant (P<0.01) NS= Non significant * =significant (P<0.05)

CONCLUSION

In the present study was concluded that histologically the thymus gland was covered by thin connective tissue capsule. Number of Hassall's corpuscles increased with advancement of age which may be contributed the activeness of thymus in advancement of age.

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