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Macro anatomical studies on lymph node of Pati duck (*Anas platyrhynchos domesticus*) of Assam at different stages of development

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Abstract

Duck is one of the most important species in poultry industry and intensifying farming. The Pati duck population constitutes a major indigenous duck variety in the state of Assam. In present study, forty-five apparently healthy Pati ducks at irrespective of sex were grouped into five as per their ages where each group contained nine birds. The cervical lymph nodes were observed from 4th week of age of Pati duck. The gross shapes of the cervical lymph node were elongated to spindle shaped. The lumbar lymph nodes were found from the 16th week of age of Pati duck. The lumbar lymph nodes were elongated. The length, breadth, thickness and weight of the cervical and lumbar lymph node showed an increasing trend with advancement of age.

Keywords: Macro Anatomy, Lymph node, Pati duck, postnatal, development

Introduction

Now a days poultry industry is the fastest growing industry in India. The major contribution towards the poultry meat is accomplished by broiler birds and for layer birds like Rhode Island red, White leg horn etc. Duck is also one of the most important species in poultry industry and intensifying farming. Duck may further contribute to growth of the poultry. Assam possesses the population with about 8.4 million (Basic Animal Husbandry Statistics, 2014). As such Assam is one of the major duck rearing state in India. The Pati duck population constitutes a major indigenous duck variety in the state of Assam. The lymph nodes play an important role in defense mechanism of Pati duck by secreting IgA. Being a local variety of Assam and very scanty literature is available on the macro anatomical study on the lymph node of Pati duck. Hence, the present study was designed to establish anatomical norms on lymph node of Pati duck of Assam at different stages of development.

Materials and Methods

The present studies were conducted on 45 numbers of Pati duck of Assam of irrespective of sex at different stages of development. The birds were divided into five group viz., 1st week, 4th week, 16th week, 24th week and 42nd weeks of age. The ducks were procured from Pathsala and nearby area of Barpeta district of Assam to conduct research for a period of three years. The experimental birds were brought to the Department of Anatomy and Histology, College of Veterinary Science, Assam Agricultural University, Khanapara, Guwahati and were sacrificed according to the method [2]. After slaughter, the birds were placed on a clean dissecting table, and skin and fascia were reflected carefully without disturbing the organs. The abdominal cavity of each experimental birds were exposed by making a ventro-median incision and then the abdominal muscle layers, peritoneum and air sacs of abdominal region were reflected properly. The location and relative topographic position of the lymph nodes were observed *in-situ* of each age group of birds. The length, breadth and thickness of lymph nodes were be recorded by Vernier caliper [8]. The weight of lymph nodes were recorded with the help of electronic pan balance.

Results and Discussion

In current investigation, one pair of cervical lymph node of Pati duck were located close to the jugular vein and caudal to the thyroid gland in the thoracic inlet, i.e. at the level of confluence

of jugular vein with cranial vena cava from 4th week to 42 weeks of age of Pati duck (Fig. 1 & 3). Similar finding was observed by [6] in duck, [4] in duck, [9] in duck and [10] in Kuttanad duck whereas [7] opined that one pair of cervical lymph node was observed at 4th week of age close to the thoracic inlet and adjacent to the internal jugular vein lying embedded in the sub dermal connective tissue of Khaki Campbell duck. The gross shapes of the cervical lymph node were elongated to spindle shaped (Fig. 2). This finding was supported by the finding of [3] in duck and [10] in Kuttanad duck.

The mean length of the cervical lymph node was 3.95 ± 0.66 , 4.55 ± 0.28 , 7.22 ± 0.13 and 8.72 ± 0.02 mm during 4th week, 16th week, 24th week and 42nd weeks of age of duck, respectively (Table. 1). Contrary to the present findings, [3] reported that the length of cervical lymph node was 1.5 to 3.0 cm while [9] revealed that the length of the lymph node was 10-15 mm in duck. It might be due different age of the duck. The average breadth was 2.58 ± 0.10 , 2.96 ± 0.37 , 3.25 ± 0.01 and 3.29 ± 0.01 mm during 4th week, 16th week, 24th week and 42th week of age, respectively (Table. 1). Similar findings were observed by [3] in duck. The mean value of thickness of lymph node was also recorded as 1.39 ± 0.01 , 1.67 ± 0.17 , 1.95 ± 0.01 and 2.25 ± 0.10 mm, during 4th week, 16th week, 24th week and 42th week of age, respectively (Table. 1). However, [9] marked that the thickness of the lymph node was 3-5 mm in duck, respectively. It might be due to different age of the birds. The weight of lymph node was 0.06 ± 0.01 , 0.34 ± 0.09 ,

0.74 ± 0.08 and 0.89 ± 0.00 gm, during 4th week, 16th week, 24th week and 42th week of age, respectively (Table. 1). The length and weight of the lymph node showed an increasing trend with the advancement of age. The length, breath, thickness and weight of the cervical lymph node were highly significant ($P < 0.01$) among these age groups. Contrary to the present findings, [7] revealed that the weight, length and breadth of the lymph node were 0.12 ± 0.00 gm, 14.48 ± 0.03 mm and 3.67 ± 0.01 mm, respectively at 4th week of age of Khaki Campbell duck and [10] opined that its mean length and weight was 0.8 cm and 0.04 gm in adult Kuttanad duck. This might be due to different varieties of duck.

The lumbar lymph nodes were found from the 16th week of age of Pati duck (Fig. 4). The lumbar lymph nodes were elongated and situated below the synscaurum on either side of the aorta or medial side of both the kidneys (Fig. 5 & 6). Similar finding was forwarded by [3] in duck. At the early stage of development i.e. 1st week and 4th week of age the lumbar lymph nodes were unable to detect from the surrounding structures in the present investigation. This result was in accordance with the finding of [7] in Khaki Campbell duck. However, [10] reported that the lumbar lymph nodes were situated immediately ventral to the vertebral column on either side of lumbar aorta in medial plane near the origin of external iliac arteries. They were related ventro-laterally to the kidneys.

The mean length of the lumbar lymph node was 4.93 ± 1.39 , 5.13 ± 1.46 and 5.59 ± 1.63 mm during 16th week, 24th week and 42th weeks of age of duck, respectively (Table. 2). Contrary to the present findings, [9] reported that the length of lumbar lymph node was 2.5 cm in goose while [3] opined that the length of this lymph node was 2.5 cm in duck. It might be due to different age and varieties of birds. The average breadth of lumbar lymph node in the present study was 2.06 ± 0.04 , 2.07 ± 0.04 and 2.07 ± 0.16 mm during 16th week, 24th

week and 42th week of age, respectively (Table. 2). The mean value of thickness of lumbar lymph node was also recorded as 0.94 ± 0.04 , 0.94 ± 0.04 and 1.28 ± 0.04 mm during 16th week, 24th week and 42nd week of age of Pati duck, respectively (Table. 2). However, [9] reported that the thickness of lymph node was 0.5 cm in goose. It might be due to different species of the birds. The weight of lumbar lymph node was 0.07 ± 0.00 , 0.09 ± 0.00 and 0.13 ± 0.00 gm during 16th week, 24th week, and 42th week of age of duck, respectively (Table. 2). The thickness and weight of the lumbar lymph node was highly significant ($P < 0.01$) between the various age groups. Contrary to the present findings, [10] reported that the mean length and weight was 1.2 cm and 0.095 gm respectively in adult Kuttanad duck. This might be due to different varieties of duck and different agro-climatic condition of duck.

Summary and Conclusion

The cervical lymph node was observed from the age of 4th week of age of Pati duck and located close to the jugular vein and caudal to the thyroid gland in the thoracic inlet. The lumbar lymph node was observed from the age of 16th week of Pati duck. The lumbar lymph nodes were elongated and situated below the synscaurum on either side of the aorta or medial side of the kidneys. The length, breadth, thickness and weight of the cervical and lumbar lymph node showed an increasing trend with advancement of age. It will help the immunologist for effective vaccine production of Pati duck.



Fig 1: Photograph showing the cervical lymph node (black arrow) and syrinx (red arrow) of 4th week old Pati duck



Fig 2: Photograph showing the ex-situ position of cervical lymph node (black arrow) of 24th week old of Pati duck



Fig 3: Photograph showing the in situ position of cervical lymph node (black arrow), thyroid gland (red arrow) and trachea (white arrow) of 42 week old Pati duck



Fig 5: Photograph showing the lumbar lymph node (black arrow) of 24th week of old Pati duck.



Fig 4: Photograph showing the lumbar lymph node (black arrow) of 16th week old pati duck.

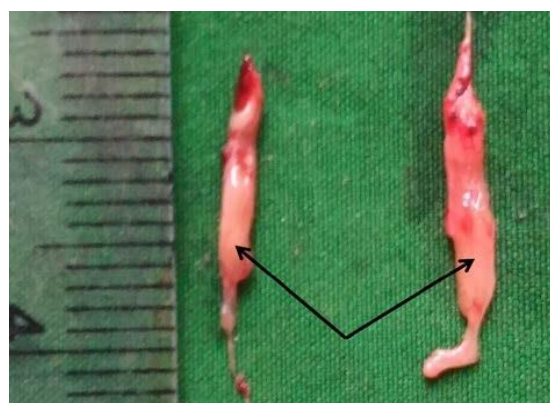


Fig 6: Photograph showing the ex-situ position of lumbar lymph node of 24th week of Pati duck

Table 1: Mean ± SE value of cervical lymph node of Pati duck at different age group.

| Experimental Group | Age in week | Length (mm) | Breath (mm) | Thickness (mm) | Weight (gm) |
|--------------------|-------------|-------------|-------------|----------------|-------------|
| II | 4th | 3.95±0.66c | 2.58±0.10b | 1.39±0.01c | 0.06±0.01c |
| III | 16th | 1.61±0.28d | 1.53±0.37c | 1.67±0.17bc | 0.34±0.09b |
| IV | 24th | 7.22±0.13b | 3.25±0.01a | 1.95±0.01b | 0.74±0.08a |
| V | 42nd | 8.72±0.02a | 2.19±0.01b | 2.25±0.10a | 0.09±0.00c |

Mean with different superscripts are significantly different from each other

Table 2: Mean ± SE value of lumbar lymph node of Pati duck at different age group

| Experimental Group | Age in week | Length (mm) | Breath (mm) | Thickness (mm) | Weight (gm) |
|--------------------|-------------|-------------|-------------|----------------|-------------|
| III | 16th | 4.93±1.39 | 2.06±0.04 | 0.94±0.04b | 0.07±0.00b |
| IV | 24th | 5.13±1.46 | 2.07±0.04 | 0.94±0.04b | 0.09±0.00a |
| V | 42nd | 5.59±1.63 | 2.07±0.16 | 1.28±0.04a | 0.09±0.00a |

Mean with different superscripts are significantly different from each other

References

1. Basic Animal Husbandry and Fisheries Statistics. Ministry of Agricultural, Department of Animal Husbandry, Dairying and Fisheries, Krishi Bhawan, New Delhi, AHS Series-15.
2. Gracy JF. Bleeding Method of Slaughtering-Slaughter. Meat Hygiene. Edn. 1986; 8:144-145.
3. Kings AS. Aves urogenital system. In: Sisson and Grossman's the anatomy of the domestic animals. Robert Getty (eds.). Edn 5 W. B. Saunders Co., Philadelphia, 1977; 2:2015-2017.
4. Kings AS, McLelland J. Outline of Avian anatomy. Edn 6, Baillier Tindall, London, 1975, 103.
5. Papia Khatun, Ziaul Haque, Shonkor Kumar Das. Histological examination of testicular cell development in khaki Campbell ducklings (*Anas Platyrhynchos Domesticus*). International Journal of Biology Research. 2019; 4(1):55-57.
6. Kumar P, Das P, Paul S, et al. Post-natal development of Lymph nodes of Khaki Campbell duck (*Anas platyrhynchos*). Indian Journal of Veterinary Anatomy. 2013; 25(1):9-11.
7. McCance RA. The effect of age on the weights and lengths of pigs intestine. Journal of Anatomy. 1974; 117(3):475-479.
8. Nickel R, Schummer A, Seiferle E. Anatomy of the Domestic Birds. Verlag Paul Parey, Berlin, Hamburg. 1977; V:104.
9. Patki HS, Lucy KM, Harshan KR, Chungath JJ. Postnatal Development of Lymph nodes in Kuttanad Duck (*Anas platyrhynchos domesticus*). IV World Waterfowl Conference, Thrissur, India, 2009, 145-147.
10. Koch T, Rossa E, Skold BH, Devries L. Anatomy of the chicken and domestic birds. The Iowa state University press, Ames, Iowa, 1973, 115.