

IMMUNOHISTOCHEMICAL STUDIES OF THYMUS IN CHICK EMBRYO OF RIR LAYERS (*GALLUS GALLUS DOMESTICUS*)

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Abstract: Immunohistochemical study was carried on thymus of 30 apparently fresh fertile eggs from 1 to 21 days of incubation divided into 3 age groups as 1-8 days of incubation (Group I), 9-15 days of incubation (Group II) and 16-21 days of incubation (Group III). It was found that the appearance of thymic lymphocytes began to form at the mid period of incubation. T Lymphocytes were observed in the cortex and medulla region of the thymus and their number increased with advancement of age, which indicated its role in growth and defence against infection in birds.

Keywords: Immunohistochemical studies, chick embryo, Thymus, T Lymphocytes.

INTRODUCTION

The studies on immunohistochemical activity of lymphoid tissue have revealed cellular resistance to various bacterial and viral diseases in poultry Fennell (1968). The resistance of birds depends upon the immune system, which include lymphoid organs. Thymus is a lymphoepithelial organ Dellmann and Brown (1987), which determines the number of lymphocytes in lymphatic organs. It also regulates the immunologic competence of animals Dellmann (1971). Thymus is essential for development of peripheral lymphoid tissue and their associated adaptive immune function Clawson *et al.* (1967). In fowl, 'T' and 'B' lymphocytes are mainly responsible for immune response.

MATERIALS AND METHODS

The thymus was collected from 30 chick embryos from fresh fertile eggs, which were divided into three age groups (n=10) as group I (1-8 days of incubation), Group II (9-15 days of incubation) and Group III (16-21 days of incubation). The tissue pieces were fixed in Baker's solution at 4⁰C. After 24 hours of fixation, the tissues were washed by a brief rinse in tap water. The tissues were dehydrated in acetone by giving three changes, cleared in xylene at 4⁰C for 16 to 24 hours and embedded in paraffin wax. Sections were stained by Alpha

*Received July 4, 2016 * Published Aug 2, 2016 * www.ijset.net*

Naphthyl Acetate Esterase (ANAE) technique suggested by Ranki *et al.* (1980) for histological identification of T lymphocytes in the tissue sections.

RESULTS AND DISCUSSION

In the present study, the presence of T lymphocytes was ascertained by performing Alpha Naphthyl Acetate Esterase (ANAE) method. The cells were identified by presence of brown coloured cytoplasmic granules and were found in the cortex and medulla in groups II and III (Fig. 1 & 2). Number of T lymphocytes was increased with the advancement of age. The density of T cells was observed more in group III (Fig. 2) as compared to Group II (Fig. 1). These observations of the present study are in accordance with those reported by Kumar *et al.* (2002) who stated that the T lymphocytes were noticed in the cortex but were not responsive to mitogenic stimuli. They further mentioned that the T lymphocytes actually started functioning at 21st day of incubation. In agreement with the present observations, Dhande *et al.* (2002) reported presence of T lymphocytes on 19th day of incubation. Similarly, Ham and Cormack (1987) reported that T lymphocytes entered the peripheral blood stream from thymic cortex, which serve as a lifelong source of T lymphocytes but it was more active only during fetal life. According to EnDong and WanFang (1996), the thymic cells from the chick embryos of 17-18 days of incubation were responsible for cell mediated immunity. The higher density of T lymphocytes in the III group found in the present study might be necessary for growth and defence against infection in birds.

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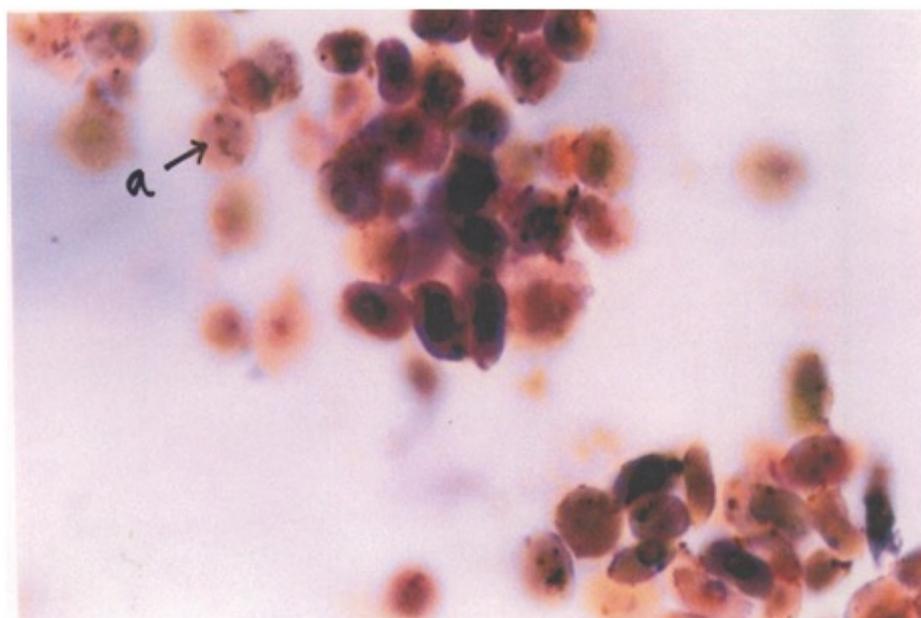


Fig. 1. Photomicrograph of Thymus in group II showing a. T lymphocyte
ANAE 500X

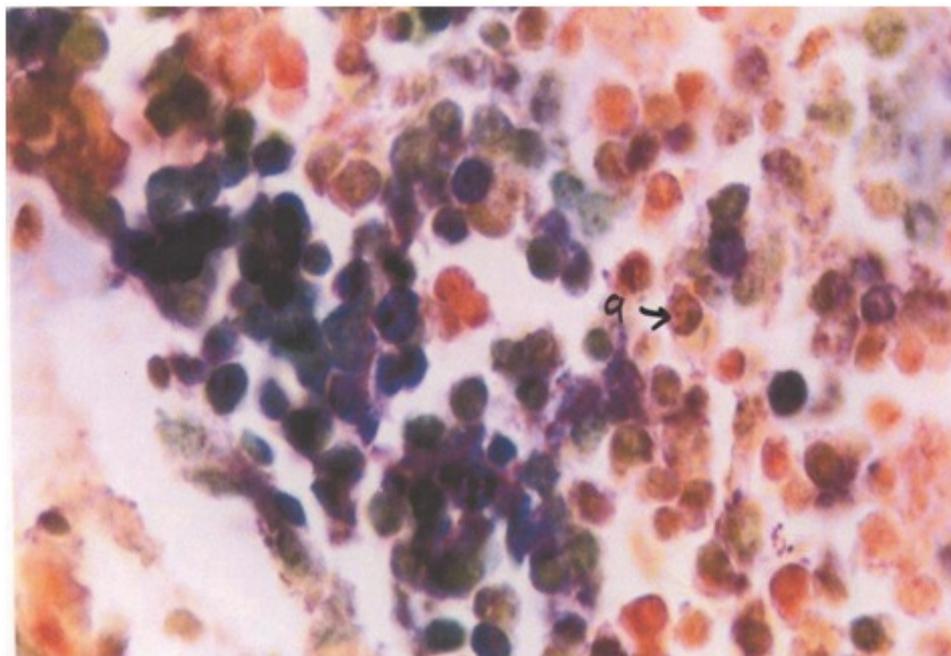


Fig. 2. Photomicrograph of Thymus in group III showing a. T lymphocyte
ANAE 500X