Light Microscopic Studies of Caecal Tonsil in Chicken (*Gallus domesticus*)

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ABSTRACT

Light microscopic studies on caecal tonsil of layer chicken revealed two types of lymphoid aggregations (germinal centre). The first type had an incomplete capsule and the second type was found encapsulated with connective tissue. The capsule of the germinal centre was consisted of many layers of flattened reticular cells. The germinal centre was consisted of lymphoblasts, lymphocytes of various sizes, reticular cells, plasma cells, mast cells and macrophages. The lymphocytic population was comparatively reduced with an increased number of fibroblasts and collagen fibres in 40 weeks-old birds. The caecal tonsil also had M cells with short and irregular microvilli.

Key words: Caecal tonsil, Chicken

Caecal tonsil regulates not only the immunodefence mechanism of the caecal environment by proliferation of microflora continuously but also prevents the invasion of extra caecal micro-organisms. This is brought about by organization of enormous lymphoid nodules throughout the caecal mucosa forming tonsils (Kitagawa *et al.*, 1998).

Light microscopic study of caecal tonsil in layer chicken was conducted in six different age groups i.e day-old, four, eight, twelve, twenty and forty weeks age. Six birds were used in each age group. The tissue pieces were collected from caecal tonsil and fixed in 10 per cent neutral buffered formalin and Bouin’s fluid followed by processing for paraffin technique of light microscopy (Bancroft and Stevens, 2007). Tissue sections of 3-5 µ were used for the routine hematoxylin and eosin staining method (Singh and Sulochana, 1978) and Masson’s trichrome method for collagen and muscle fibres (Luna, 1968).

Caecal tonsils were the lymphoid aggregations (germinal centres) located at the junction of caecum and colo-rectum. Two types of germinal centres were observed in all the age groups. The first type had an incomplete capsule and the lymphocytes were diffusely distributed as reported earlier (Olah and Glick, 1979). This type of germinal centre was noticed near the muscular layer of the caeca (Fig. 1) and might represented a specific site of uncommitted cell proliferation and differentiation. The location of plasma cells and plasmablasts in the caecal tonsil suggested that their lymphoid precursors could originate from the first type of germinal centre.

![Fig. 1. Photomicrograph of caecal tonsil of a day-old chick showing the first type of germinal centre (Gc) having capsule (Ca) and tunica muscularis (Tm). H. & E. × 400](image)

The second type of germinal centre was seen located in the lamina propria and closer to the surface epithelium of the villi of the caecum. This germinal centre was encapsulated by connective tissue comprising mainly the collagen fibres as reported earlier by Olah and Glick (1979). Hence, it was presumed that the development of second type of germinal centre might depend upon antigenic influences which passed from the lumen to the germinal centre through the surface epithelium or via the vascular system. Upon maturity of the immune system, most of
the immunological activity within the gut-associated lymphoid tissue was concentrated in the hind gut, specifically in the caecal tonsil and bursa of Fabricius (Bar-Shira and Friedman, 2005). The cellular components of the germinal centres included lymphoblasts, lymphocytes of various sizes, reticular cells, plasma cells, mast cells and macrophages (Fig. 2).

REFERENCES


