Thesis

IMMUNOHISTOCHEMICAL STUDY ON THE LYMPHOID TISSUES ASSOCIATED WITH THE UPPER DIGESTIVE AND RESPIRATORY TRACTS OF CHICKEN

Nobuaki ARAI

Department of Veterinary Anatomy
Faculty of Veterinary Medicine
Hokkaido University, Sapporo 060, Japan

Posthating distributions of lymphoid tissues associated with the chicken upper digestive and respiratory tracts were analysed histologically, and the immunoglobulin-containing cells (cIg: cIgG, cIgA or cIgM) or T cells which appeared in these lymphoid tissues were estimated histoplanimetrically.

In adults, lymphoid cell accumulations were found randomly in the lamina propria mucosae throughout the upper digestive and respiratory tracts, and well developed follicular lymphoid aggregations were noted in the esophageal tonsils upper digestive tract and in the mesobronchial lymphonodules in the respiratory tract. Medium-sized follicular lymphoid aggregations were commonly found in the pharynx and pyloric regions in the upper digestive tract and in the larynx in the respiratory tract.

The histoplanimetry of cIg showed the highest frequency in each class of cIg locally in the area of esophageal tonsils. The frequency of cIgG was predominant in number compared with that of cIgA and cIgM throught the upper digestive and respiratory tracts, and during the course of posthatching development, a small number of cIgG was found first in the esophageal tonsils and in the mesobronchial lymphonodules at 5 days of age. In these regions, an active increase of the number of cIg, especially of cIgG, was shown until 2 weeks of age. Furthermore, during this period, the formation of germinal centers was noted in these lymphoid tissues, in which a large number of T cells had previously appeared at the 20th prehatching day. In other lamina propria both in the upper digestive and respiratory tracts, the frequencies of cIg and T cells increased gradually according to age.

These results suggest that the esophageal tonsils in the upper digestive tract and the mesobronchial lymphonodules in the respiratory tract may play important roles as one of the major parts of the mucosal immune system corresponding to the Peyer's patches in the distal ileum and caecal tonsils in the lower digestive tract. It was postulated that the former lymphoid tissues facilitate the differentiation and proliferation of bursa-derived precursor cells of Ig-containing cells under the condition that T cells are functioning in antigen-rich circumstances.