IMMUNOHISTOCHEMICAL STUDY ON THE GUT-ASSOCIATED LYMPHOID TISSUES OF THE CHICKEN

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Posthatching distribution of chicken gut-associated lymphoid tissues and the immunohistoplanimetry on the immunoglobulin (Ig ; IgA, IgM and IgG)-containing cells or T cells were studied.

In adults, lymphoid cell accumulations, which were randomly located in the tunica mucosa throughout the intestine, and large follicular lymphoid aggregations (FLA), which were fixed in the regional part of the intestines, were noted. The latter were identified as the lymphoid tissues associated with Meckel's diverticulum, Peyer's patches (PP) in the lower ileum and caecal tonsils (CT).

In the intestinal mucosa, except for FLA, the immunohistoplanimetry showed the highest frequency of all the Ig-containing cells in the duodenum. IgA-containing cells showed the highest frequency in the duodenum, in contrast to the highest frequency of IgG-containing cells in the lower intestine. Only a few IgM-containing cells were observed throughout the intestine.

As to estimation of the relative number of respective Ig-containing cells in the FLA, the frequency of IgG-containing cells was higher than that of IgA- and IgM-containing cells. A small number of Ig-containing cells were noted in the germinal centers.

During posthatching development of Ig-containing cells in the lamina propria, except for FLA, an active increase in the number of the respective Ig-containing cells was shown until 2 months of age, and then the rates were almost the same as those in adults. In PP and CT, however, the rates increased until 2 weeks of age, and then reached almost the same rate in adults. A large number of T cells had previously appeared by the 20th prehatching day in PP and CT. In the latter two regions, germinal centers began to appear at 2 weeks of age and were noted to have Ig-containing cells. Additionally, in the lymphoid follicles of the bursa of Fabricius, Ig-containing cells were already observed by the 20th prehatching day.

These results suggest that the lymphoid cells in the PP and CT play a role in the posthatching differentiation and proliferation of intestinal Ig-containing cells, and that the posthatching development of a proper immune system in chicken intestine is completed by 2 months of age.