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Author(s)	HIRAGA, Takeo
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EFFECT OF CYCLOPHOSPHAMIDE ON THE THYMUS AND THE BURSA OF FABRICIUS IN CHICKEN

Takeo HIRAGA

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

The effect of Cyclophosphamide (Cy) on the thymus and the bursa of Fabricius (BF) was examined morphologically. Two hundred two White Leghorn chickens from the day of hatching to 7 weeks old were used in this investigation. The chickens were divided into four groups. Three groups were i. m. injected with 6 mg Cy on the hatching day only (group E6), during the first 2 days (group E12) and during 3 days after hatching (group E18). The fourth group was saline control (group C).

The thymus weight decreased abruptly just after the first injection of Cy on the hatching day and had an involutinal bottom at the age of 4~5 days. The histological changes in the thymus appeared to be greater in the cortex than in the medulla. A degeneration of lymphocytes, an increase of macrophages, hypertrophy of reticular cells and the disappearance of mitotic cells were observed in the cortex during early involution. Recovery began as soon as the large lymphocytes appeared at the subcapsular region of the surviving cortex. The weights and the morphological structures of the thymuses in Cy-treated birds recovered completely in all groups until 3 weeks of age.

The BF was the most sensitive organ to Cy and never returned to normal in relative weight until 7 weeks. In the histological observation almost all the lymphocytes existing in the bursal lymphoid follicles disappeared within twelve hours after the first injection of Cy on the hatching day. Restoration of the lymphoid follicle was observed mainly in group E6 and in group E12 from 5 to 10 days of age, while almost no restoration in group E18 took place during this observation. The follicular recovery possibly occurred in the following steps: Step 1—a gathering of large or medium-sized pyroninophilic lymphoid cells around the involutinal follicles, probably from an organ other than the BF; Step 2—appearance and proliferation of these cells in the medullary portion with partial development of the cortex; and Step 3—normal structure of the bursal follicle. The follicles, including many plasma cells, were found during the regenerative process.

Differences in sensitivity to the action of Cy were observed among the

lymphocytes depending upon their size and location. Cy-sensitive lymphocytes were the small and medium-sized ones in the bursal follicles and the small ones in the cortex of the thymus, while Cy-resistant cells were the small lymphocytes in the cortico-medullary junction and the medium-sized ones in the medulla of the thymus.