

AVIAN BLOOD CHANGES FOLLOWING INJECTIONS OF CORTISONE

by G. L. BANNISTER¹

Injections of cortisone acetate in humans (1, 2) and in mammals (3) have been followed by a marked reduction in the total number of circulating lymphocytes and eosinophils and a rise in circulating neutrophils. Little information has been available up to the present concerning the action of this drug in the avian species. Accordingly, the following experiment was undertaken.

Forty aged White Leghorn hens were divided into two equal groups. One group received daily injections of 4.5 mg. cortisone acetate per kilo weight of bird for a period of thirteen days. The second group was maintained as controls under the same environmental conditions. Quantitative and qualitative blood counts were made for each group prior to the commencement of injections and again on the thirteenth day.

Among the controls, quantitative blood counts revealed no significant change in the number of erythrocytes, before or after injections, and no marked difference in the white blood cell count. The injected group showed a slight decrease in the number of cells, where it is noted in Table I that the original counts were high.

TABLE 1.
AVERAGE QUANTITATIVE WHITE BLOOD COUNT

	Before injected	13th day
Control birds.....	83,250	81,000
Injected birds.....	106,425	99,000

Results of the qualitative or differential counts are shown in Table II. These are divided into four groups for purposes of comparison and include normal controls, diseased controls, normal injected birds and diseased injected birds. Gross post mortem changes alone determined the placing of a bird in the diseased group.

While these differential counts show that heterophiles (neutrophils) increased and that there was a decrease in eosinophils and lymphocytes, the changes were not consistent and the inconsistency was not confined to birds in which disease was noted.

A consideration of the heterophiles in the healthy birds after injection indicates that all in this group followed the general pattern and showed an increase

¹Division of Animal Pathology, Science Service, Dominion Department of Agriculture, Poultry Pathology Laboratory, Ottawa.

in the number of cells. This was also the general picture presented by the birds that showed disease, with one exception in which there was a slight decrease.

TABLE 2.
AVERAGE QUALITATIVE CELL COUNTS

	Normal Before Injected	Normal Controls	FINAL BLOOD COUNTS		
			Diseased Controls	Normal Injected	Diseased Injected
Heterophiles.....	40.2	46.0	41.8	100.0	77.0
Eosinophils.....	4.3	4.6	4.6	1.0	1.3
Basophils.....	5.0	5.2	4.2	4.0	4.1
Monocytes.....	6.6	7.6	8.0	6.1	8.2
Lymphocytes.....	143.6	136.4	141.4	88.8	109.1

All but one of the normal birds showed a decrease in eosinophils, while in the diseased group two birds showed an increase and one remained unchanged.

A decrease in monocytes was shown by all birds in the normal group, with two exceptions. One of these showed an increase and one remained unchanged. By contrast, among the diseased birds, in a group of eleven, seven showed an increase, one remained unchanged and only three showed a decrease.

With one exception in the disease group, all birds of both groups revealed a decrease in lymphocytes.

Three birds in the diseased group showed a consistent deviation. One which showed an increase in eosinophils and monocytes was found upon necropsy to have cystic ovaries and severe fatty degeneration of the liver. A second bird which indicated a slight decrease in heterophiles from its original counts and an increase in monocyte and lymphocyte counts on post mortem examination also showed severe fatty degeneration of the liver. The third bird whose eosinophil and monocyte counts remained unchanged was found to be suffering from peritonitis.

SUMMARY

Twenty aged White Leghorn hens were injected daily with cortisone acetate for thirteen days. Although not consistent in all birds, the resulting changes in the blood picture nevertheless indicated that they simulated those found in the blood of persons and mammals following cortisone acetate injections, in that there was an increase in the number of heterophiles and a decrease

in eosinophils and lymphocytes. In general, the increase in the heterophiles was not as great in the diseased group as in the normal birds, nor was the decrease in lymphocytes so marked.

ACKNOWLEDGEMENTS

The author wishes to express appreciation to Dr. C. A. Mitchell, Chief, Division of Animal Pathology, for his interest during the course of this study. Thanks are also expressed to the staff of the Poultry Pathology Laboratory for their assistance.

REFERENCES

1. HILLS, A. GORDON, PETER H. FORSHAM and CLEMENT A. FINCH. Changes in circulating leukocytes induced by the administration of pituitary adrenocorticotrophic hormone (ACTH) in man. *J. Hematology (Blood)* 3: 755-768. 1948.
 2. VALENTINE, WILLIAM N., CHARLES G. CRADDOCK, Jr. and JOHN S. LAWRENCE. Relation of adrenal cortical hormone to lymphoid tissue and lymphocytes. *J. Hematology (Blood)* 3: 729-754. 1948.
 3. DOUGHERTY, THOMAS F. and ABRAHAM WHITE. An evaluation of alterations produced in lymphoid tissue by pituitary-adrenal cortical secretions. *J. Lab. and Clin. Med.* 32: 584-605. 1947
-