

14008 P

Use of Adrenal Cortical Hormone in *Cl. welchii* Infections in Guinea Pigs.

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The work of Singer of Australia¹ has shown that desoxycorticosterone has a protective value in mice given lethal doses of *Cl. welchii* toxin. It is known that the adrenal glands of animals dying of *Cl. welchii* infections show congestion at autopsy.

These experiments were performed in order to ascertain whether or not relatively large doses of adrenal cortical extract† given subcutaneously to guinea pigs, which had been infected intra-muscularly with lethal doses of *Cl. welchii* organisms, would have any protective value to these infected animals.

Guinea pigs weighing between 9 and 12 ounces were used in this experiment. These animals were infected by injecting various amounts of 24-hr meat broth culture of *Cl. welchii*‡ intramuscularly, deep into the posterior muscles of the right thigh, and then crushing the muscles with a hemostat. Pigs so infected with 0.1 cc would die usually within 24 hr after the infection with the classical picture of gas gangrene infection.

Thirty guinea pigs were injected with 0.1 cc of a 24-hr broth culture, each 0.1 cc containing 16×10^9 bacteria (by the use of a standard bacterial counting chamber). Thirteen of these animals served as controls. Eleven animals were given 2 cc of adrenal cortical extract, each cc containing 25 dog units, one hour before infection and 6 injections of 2 cc every 4 hr thereafter. Six animals were given 3 doses of 4 cc each every 4 hr after infection.

There were 12 deaths in the controls with an average survival time of 28.8 hr. There were 6 deaths in the first group of 11 treated

animals, one of which was due apparently to a traumatic atelectasis, with an average survival time of 30 hr in those animals dying from the infection. All but one of the second group of 6 animals receiving 3 doses of 4 cc each of the extract 3 died, with an average survival time of 47.5 hr. *Cl. welchii* were recovered from the thighs of all animals that died of the infection.

In another series, 10 animals were infected with 0.2 cc of a similar culture of *Cl. welchii* (24-hr meat broth culture) 8 of which were injected immediately with 2 cc of adrenal cortical extract subcutaneously and 2 cc every 4 hr thereafter until death, 2 animals serving as controls. One control died 8 hr, the other dying 12 hr after infection.

Five of the treated animals died 16 hr after infection having received in all 10 cc of adrenal cortical extract. The sixth animal died 24 hr after infection having received a total of 14 cc of adrenal cortical extract; the seventh animal died 32 hr after infection, having received a total of 18 cc of adrenal cortical extract, and the eighth animal died in 36 hr after infection, having received a total of 20 cc of the extract.

TABLE I.
Infecting Dose—0.1 cc *Cl. Welchii*.

No. of animals	Treatment cc adrenal cortical extr.	Avg survival time, hr	Survivors
13	0	28.8	1
6	3 doses of 4 cc every 4 hr	47.5	1
11	6 doses of 2 cc 1 hr before infection, then 2 cc every 4 hr	30	5

Infecting Dose—0.2 *Cl. Welchii*.

No. of animals	Treatment cc adrenal cortical extract	Survival time in hr
1	0	8
1	0	12
5	10	16
1	14	24
1	18	32
1	20	36

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¹ Singer, E., *Med. J. Australia*, 1940, **2**, 275.

† Furnished by Parke Davis and Co. under the name of Eschatin.

‡ Kindly furnished by Dr. A. H. Dowdy, Rochester, New York.

All animals at autopsy showed the typical picture of *Cl. welchii* infection. Microscopic studies of the adrenal cortex of the dead animals showed hemorrhages into this area.

The results are shown in Table I.

Summary and Conclusions. Under the conditions of this experiment, it would ap-

pear that the adrenal cortical hormone extract has a protective value in delaying death in experimental *Cl. welchii* infections in guinea pigs.

We are indebted to Miss Irene Zucker of this department for her assistance in this work.

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Immunologic Studies on Experimental *Trypanosoma cruzi* Infections: I. Lysins in Blood of Infected Rats.*

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These observations were made while comparing the effects of experimental *Trypanosoma cruzi* infection in normal rats with those obtained in animals subjected to blocking of the reticulo-endothelial system with an inert substance, trypan blue. It has been shown that mechanical blockade of the reticulo-endothelial system in bacterial infection reduces antibody formation.¹ *Leishmania* forms of *Trypanosoma cruzi* are frequently found in cells of the reticulo-endothelial system² and a related organism, *Leishmania donovani*, has been used as a biological block for these cells during certain immunological studies.³ Production of antibodies in *Trypanosoma cruzi* infections has been previously demonstrated,⁴ and further studies have since been made on various immunological aspects of the infection. When rats recover from this infection they are insusceptible to reinfection and their serum is capable of protecting others against infection.⁵ Some very high titers of serum have been obtained

from animals immunized against this organism⁶ and agglutination and precipitation tests demonstrate a degree of species-specificity.

During the course of this work simple hanging-drop preparations were made to determine the action of blood serum from the experimental animals upon cultured *Trypanosoma cruzi* of the same strain with which the animals had originally been infected. A lot of 20 rats was separated into 3 main groups: those which were infected to serve as controls; those in which the trypanosome infection had been superimposed upon a mechanically blocked reticulo-endothelial system; those which had been previously blocked with trypan blue. The animals were all of the same age and stock and the infection produced was uniformly light.⁷ Equal parts of test serum and physiologic saline suspension of washed organisms from culture were mixed on a coverslip and inverted on a depression slide. Except for one set of slides the observations were made at room temperature, and a physiological saline control was kept in all cases. Five sets of observations were made to determine the effects of (1) full strength fresh serum, (2) inactivated

* Aided by a research grant to the Department of Tropical Medicine, Tulane University, by Eli Lilly and Co.

¹ Tuft, L., *J. Immunol.*, 1934, **27**, 63.

² Dias, E., *Compt. rend. Soc. Biol.*, 1932, **110**, 206.

³ Kurotchkin, J. T., and Chung, H. L., *National Med. J. China*, 1930, **26**, 43.

⁴ Chagas, E., *Nov. Reun. de la Soc. Argentina*, 1936, 1-19.

⁵ Culbertson, J. T., and Kolodny, M. H., *J. Parasit.*, 1938, **24**, 83.

⁶ Paekchanian, A., *Pub. Health Repts.*, 1940, **55**, 2116.

⁷ Kolodny, M. H., *Am. J. Hyg.*, 1940, **32**, 21.