

traperitoneal injection of 0.3 g/kg of polymerized sodium *p*-melaminyphenylstibonate. One month later the animals are given a *T. equiperdum* infection which kills the untreated controls without exception in 3 to 5 days. The test infection is repeated at weekly intervals on the surviving mice found to be free of trypanosomes. Untreated controls are set up at each infection and die without exception within 3 to 5 days. Blood examinations are performed daily on all animals. The results are summarized in Table I.

It is noteworthy that the mice finally breaking down under multiple infections show an atypical form of trypanosomiasis, differing basically from the classical acute blood infection characterized by the number of trypanosomes increasing continuously and progressively until death occurs. The pretreated

animals present a chronic infection, of the human and rabbit type, with parasites appearing in and disappearing from the blood at irregular intervals. The post mortem of these chronic cases shows, invariably, an enormously enlarged spleen up to 10 times the weight and size of the normal spleen.

In this last experiment with repeated infections the mechanism of the prophylactic effect may possibly include an immunological factor.

Summary. A new heterocyclic stibonic acid is described, having a pronounced prophylactic effect in the *T. equiperdum* infection of the mouse and which cures this infection with a single intraperitoneal dose representing 1/200th of the maximum (100%) tolerated dose.

15397

Concentration of Chloride, Sodium and Potassium in Blood of Guinea Pigs Treated with Desoxycorticosterone Acetate.*

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The fibromatogenic effect of estrogens is known from the work of Nelson,¹ Lipschutz and Iglesias.^{2,3} Subsequently the anti-fibromatogenic effect of steroids such as progesterone, testosterone, dihydrotestosterone and desoxycorticosterone has been demonstrated by Lipschutz and others.⁴

Desoxycorticosterone offers special interest clinically because the sex organs were not affected by antifibromatogenic quantities of this steroid, as was the case with the androgens. However, several clinicians^{5,6} have described toxic actions in patients treated with therapeutic doses of desoxycorticosterone acetate. Changes in the concentration of the ions of the blood have been found in these patients. Selye and his collaborators^{7,8} have induced important modifications of the ionemia with

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¹ Nelson, W. O., *Anat. Rec.*, 1937, **68**, 99.

² Iglesias, R., Tesis Universidad de Chile, 1938 (Public. Med. Exp., No. 1).

³ Lipschutz, A., and Iglesias, R., *C. R. Soc. Biol. (Paris)*, 1938, **129**, 519.

⁴ Lipschutz, A., *Cold Spring Harbor Sympos. on Quantit. Biol.*, 1942, **10**, 79.

⁵ Loeb, R. F., Atchley, D. W., Ferrebee, S. W., and Ragan, C., *J. Am. Physic.*, 1939, **54**, 285.

⁶ Ferrebee, S. W., Ragan, C., Atchley, J. S., and Loeb, R. F., *J. Am. Med. Assn.*, 1939, **113**, 1725.

⁷ Selye, H., and Dosne, C., *Proc. Soc. Exp. Biol. and Med.*, 1940, **44**, 165.

⁸ Selye, H., and Hall, C. E., *Arch. Path.*, 1943, **36**, 19.

TABLE I.

Forty-eight Castrated Female Guinea Pigs with Subcutaneously Implanted Small Tablets of Diethylstilbestrol and Desoxycorticosterone Acetate. Necropsy at 113 to 115 Days after Castration and Implantation.

Groups	Estrogen per day avg μg	Desoxy- cortico- sterone per day avg μg	Wt of uterus g	Fibrous tumoral effect F.T.E. avg units§	No. of animals total	No. of animals reaching avg F.T.E. of stilb. group	No. of tumo- ral marks of classes 2 and 3 per animal§
I No treat- ment	(a) 0	(b) 0	(c) —	(d) 0	(e) 16	(f) 0	(g) 0
II Estrogen only	13.4 (9-18)*	0	7.0 (5.0-9.0)†	5.5	10	5	1.6
III Estrogen and des- oxycorti- costerone	15.0 (9.5-29)	222 (159-275)	3.1 (1.7-4.0)‡	1.7	11	0	0.1
IV Only des- oxycorti- costerone acetate	0	217 (131-265)	0.7 (0.3-1.2)	0	11	0	0

* () Range.

† One 13.0 g. ‡ One 7.7 g.

§ For the system of classification and units see Lipschutz *et al.*^{12,13}

large quantities of desoxycorticosterone acetate. But Lipschutz and Vargas⁹ were unable to obtain any toxic effect with quantities of desoxycorticosterone acetate by which estrogen-induced abdominal fibroids were prevented in the guinea pig.

In the present paper we refer to the determination of chloride, sodium and potassium in the blood of guinea pigs treated during 113 days simultaneously with fibromatogenic quantities of diethylstilbestrol and quantities of desoxycorticosterone acetate sufficient to prevent estrogen-induced fibroids. The determinations of chloride, sodium and potassium were made in the plasma. Blood was obtained by puncture of the heart. Lithium oxalate was used as an anticoagulant. Determinations were made in duplicated samples. Volhard's classical procedure with the addition of nitrobenzene was used for the determination of chloride. Microdetermination of sodium was made by the method of Marenzi and Gerschman,¹⁰ and that of potassium was

made according to the method of Kramer (quoted from Corona.¹¹)

Blood samples were taken 45, 73 and 101 days after the subcutaneous implantation of tablets. The tablets of diethylstilbestrol contained 40% estrogen and 60% cholesterol. The tablets of desoxycorticosterone acetate were prepared without any admixture.

Table I summarizes our results with necropsies of treated animals and controls. As seen from the table the quantities of desoxycorticosterone were sufficient to inhibit to a considerable degree both the estrogen-induced growth of the uterus and the fibromatogenic effect.

Results of the determination of chlorides, sodium and potassium are given in Table II.

There were no significant differences between the values obtained under the influence of estrogens or desoxycorticosterone. Sodium

¹¹ Corona, L., *Química normal y patológica de la sangre*, 3a. ed., Ereilla, Santiago (Chile), 1942.

¹² Lipschutz, A., Bellolio, P., Chaume, J., and Vargas, L., *Proc. Soc. Exp. Biol. and Med.*, 1941, **46**, 164.

¹³ Lipschutz, A., and Maass, M., *Cancer Research*, 1944, **4**, 18.

⁹ Lipschutz, A., and Vargas, L., *Lancet*, 1941, **1**, 568.

¹⁰ Marenzi, A., and Gerschman, R., *Rev. de la Soc. Arg. Biol.*, 1943, **7**, 381.

TABLE II.
mg %.

Days after implanta- tion of tablets	Chloride				Sodium			
	I Contr.	II Estrog.	III Estr.-Deso.	IV Deso.	I Contr.	II Estrog.	III Estr.-Deso.	IV Deso.
45	360	329	346	318	277	278	263	274
73	352	351	376	380	277	279	287	290
101	381	374	373	368	278	278	314	295

Days after implanta- tion of tablets	Potassium			
	I Contr.	II Estrog.	III Estr.-Deso.	IV Deso.
45	31.4	25.5	22.7	31.7
73	34.0	27.3	28.0	29.9
101	19.7	21.8	19.8	26.9

was rather high in Groups III and IV, but the average was not higher than the maximal values in Groups I and II without desoxycorticosterone. There were important variations of potassium, but they were not related to the administration of desoxycorticosterone.

Summary. A group of castrated female guinea pigs was treated with fibromatogenic quantities of diethylstilbestrol; another group was treated simultaneously with diethylstilbestrol and quantities of desoxycorticosterone acetate sufficient to prevent estrogen-induced ab-

dominal fibroids. The average fibrous tumoral effect diminished by the action of desoxycorticosterone from 5.5 to 1.7 units. Concentration of chloride, sodium and potassium in the blood of the groups treated with diethylstilbestrol, desoxycorticosterone or both was within the same range as in animals not treated. These results show that the antifibromatogenic quantity of desoxycorticosterone acetate is smaller than those doses which might interfere with the concentration of chloride, sodium or potassium in the blood.

15398

Antigenic Differences Between Strains of Scrub Typhus as Demonstrated by Cross-Neutralization Tests.

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The question of whether antigenic differences occur among strains of scrub typhus is important not only from an epidemiological point of view but also with regard to the development of a vaccine for its control. Epidemiologic studies have indicated a marked variation in the severity of outbreaks of this disease in different geographical areas.^{1,2}

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Furthermore, there have been undocumented rumors from medical officers returning from the southwest Pacific area that individuals recently recovered from the disease in one locality have been reinfected in another. This

¹ Blake, F. G., Maxcy, K. F., Sadusk, J. F., Jr., Kohls, G. M., and Bell, E. J., *Am. J. Hyg.*, 1945, **41**, 243.
² Kohls, G. M., Armbrust, C. A., Irons, E. N., and Philip, C. B., *Am. J. Hyg.*, 1945, **41**, 374.