

and the prolonged administration of an ovary-stimulating extract made from the blood of pregnant women. The "time factor" in this phenomenon is thus an important feature in comparing the effects of this hormone with those of fresh anterior hypophyseal implants.

6400

Lipolytic Activity of Rat Tissues in Experimental Leprosy.*

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Walker and Sweeney¹ suggested that an indirect or physiological method of therapeutic action of chaulmoogra oil in leprosy might be stimulation of non-specific lipolytic activity of the tissues which would attack the fatty capsule of acid-fast bacilli. We have undertaken the study of the lipolytic activity of leprous tissue in experimental rat leprosy in comparison with that of normal tissues of the same animal, and the determination of whether or not the observed ratios may be altered by treatment. We decided to ascertain first, however, what effect the presence of leprosy in the body might have on the tissue distribution of lipase in comparison with that noted in non-infected normal animals. Our observations on this point are reported herewith.

Estimations of the lipolytic activity of representative tissues were made by Loevenhart's method² on 8 healthy adult female rats and on 22 female leprous rats. The latter had been inoculated with a buffered saline suspension of finely ground rat leprous tissue from 140 to 194 days previously by Dr. E. L. Walker and Miss M. A. Sweeney. The source of this material was spontaneous leprosy in wild rats obtained from the U. S. P. H. Plague Laboratory in San Francisco, transferred about every 6 months through the Burlingame strain of albino rats for 10 generations without apparent al-

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¹ Walker, E. L., and Sweeney, M. A., *J. Inf. Dis.*, 1920, **26**, 238.

² Kastle, J. H., and Loevenhart, A. S., *Am. Chem. J.*, 1900, **24**, 491; Loevenhart, A. S., *Am. J. Physiol.*, 1902, **6**, 331.

teration in virulence. Definitely palpable lesions were present at the time of death. The 8 healthy rats and half the leprous rats were killed by a blow on the head while the remainder of the leprous rats died from pneumonia. Tissues were taken at death in all cases, and particular care was used to grind them thoroughly. Estimations on individual tissues were made in triplicate and were in agreement within the limits of error of titration with a micro-burette, that is, 0.005 cc. This gave an approximate error, using N/20 KOH, of ± 0.005 in the case of the percentage hydrolysis figures for liver, and of ± 0.05 in those for leprous tissue.

TABLE I.
Lipolytic Activity of Various Tissues in Leprous and Normal Rats as Estimated by Percentage Hydrolysis of Ethyl-butyrate.

Tissue	Leprous Rats				Normal Rats	
	Early stage small lesion		Late stage large lesion			
	No. animals	% hydrolysis	No. animals	% hydrolysis	No. animals	% hydrolysis
Lepromatous	11	0.17 ± 0.02	11	0.14 ± 0.01	—	—
Subcutaneous	8	0.83 ± 0.07	2	1.24 ± 0.19	4	0.99 ± 0.28
Abdominal Muscle	9	0.35 ± 0.14	4	0.41 ± 0.13	5	0.57 ± 0.08
Gluteal Muscle	9	0.31 ± 0.09	8	0.25 ± 0.09	8	0.42 ± 0.19
Liver	11	3.11 ± 0.98	10	1.42 ± 0.41	8	3.15 ± 0.78
Lung	9	1.67 ± 0.73	10	0.53 ± 0.14	6	1.40 ± 0.53
Heart	8	0.34 ± 0.07	6	0.27 ± 0.06	6	0.60 ± 0.10
Kidney	8	3.00 ± 0.87	8	2.67 ± 0.35	5	3.03 ± 0.47
Spleen	9	0.35 ± 0.13	10	0.45 ± 0.34	7	0.26 ± 0.06

A summary of our findings is given in the table. Since the pathological status of the leprous lesion is not wholly dependent on the time after inoculation, we decided arbitrarily to use the degree of local involvement at the site of infection as a criterion of "early" (mild) or "late" (severe) leprosy. An early lesion is small, may be localized or diffuse, but is uneven in consistency with no skin changes at the site and no slough. A late lesion is large, compact, firm, with degenerative skin changes and frequent sloughing. The estimations of the lipolytic activity of the various tissues are expressed in percentage hydrolysis of the ethyl-butyrate substrate after 30 minutes at a temperature of 38°C.

Our observations indicate 3 outstanding facts regarding the relation between experimental leprosy and the lipase content of tissues in infected rats: (1) leprous tissue is significantly lower in lipolytic activity than other tissues in infected or normal rats; (2) leprous tissue from different animals is remarkably constant in lipolytic action in comparison with other tissues in infected or normal rats, and (3) the presence of "late stage large lesion" leprosy significantly

lowers the lipolytic activity of most tissues in the body, with the probable exception of the spleen, in comparison with tissues from non-infected normal rats. Even in "early stage small lesion" leprosy there seems to be a tendency in some tissues of the infected rats, especially heart and abdominal muscle, to be significantly lower in lipolytic action than comparable tissues from healthy non-infected rats.

6401

Renal Pigmentation Following Ingestion of Psyllium Seed.

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Psyllium seed, often known as "flea seed", is the seed of a plant, *plantago psyllium*, which grows in southern European countries. This seed finds current vogue as a laxative. The seeds have the property of swelling and becoming gelatinous on contact with moisture. Their laxative action has generally been attributed to this physical change and explained on a purely physical basis.¹ During an experimental study of the effect of the roughage in the diet on the intestinal tract of the albino rat psyllium seed was used as one source of a residue substance. On sacrificing these animals after 125 days on the diet it was found that the kidneys were black in color.

Sagittal section of these organs showed most of the pigment material in the cortex with a still blacker area of demarkation toward the medulla (Figs. 1A and 1B). Microscopic examination revealed many coarse to moderately fine brown granules in the epithelial cells of the tubules (Fig. 2). These granules were most abundant in the proximal convoluted tubules and in the loops of Henle. They tended to accumulate in the basal portions of the cells and about the nuclei. Only an occasional granule was found in the lumen. The pigment was not uniformly spread through the cortex but tended to accumulate more abundantly in groups of 6-12 or more tubules. Considerable pigment was found in the outer portions of Henle's loop but none was seen in the deeper parts of the medulla. The pigment failed to give the reaction for iron when sections were treated

¹ Macht, D. I., and Black, J. A., *Proc. Am. Physiol. Soc., Am. J. Physiol., Soc., Am. J. Physiol.*, 1932, **101**, 71.