

found, even in the same individual from day to day. A dose that would produce a rise of 20 mm Hg in blood pressure in one day, might produce a rise of only half as much the next week. Neither drug had a distinct effect upon the respiratory rate.

Since increasing the systemic blood pressure and thereby probably restoring the normal pressure in the carotid sinus, did not restore the alveolar CO_2 to normal, we must assume that the overventilation of standing may not be due to the drop in blood pressure in the carotid sinus and we are forced back to the remaining hypothesis, that the respiratory stimulation is due to a relative ischemia of the brain. These results would indicate that the rise in alveolar CO_2 on bending over while standing,⁷ may be due not to the return to normal pressure in the carotid sinus, but rather to relief of the cerebral ischemia. It at first seemed illogical that the drop in blood pressure in the carotid sinus on standing should not cause respiratory stimulation, but it may be that the probable *increase* of pressure in the aorta on standing exactly neutralizes the *drop* in blood pressure in the carotid sinus.

Conclusion. Neither epinephrine nor amphetamine in the doses used affected the alveolar CO_2 tension of subjects when standing or lying. Consequently the lowered alveolar CO_2 of the erect posture may be due to a relative cerebral ischemia.

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11832

Twenty-four Hour Response to Androgens in the Immature Male Rat.*

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Astwood¹ has demonstrated that estrogens cause a measurable increase in the uterine weight of the immature rat within 6 hours after administration. The weight increment which is largely due to increased hydration of the uterine tissues forms the basis for his

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¹ Astwood, E. B., *Endocrinology*, 1938, **23**, 25.

estrogen assay method. Astwood later stated² that androgens have the same effect on the rat uterus. This latter finding has been confirmed.³ The present investigation was undertaken to determine whether or not androgens have a similar weight-increasing effect on the sexual accessories of the immature male rat.

One hundred and thirty-one male rats, 32 to 38 days old and 65 to 85 g in weight, were used. Twenty-one animals served as controls. The rest were divided into 5 groups which were given various doses of testosterone propionate† in 0.1 cc of peanut oil in a single injection subcutaneously. Twenty-four hours after treatment the animals were killed. The ventral prostates and seminal vesicles were carefully removed under a dissecting microscope and immediately weighed on a Roller-Smith micro-balance. The dosages used and the average weights of the removed organs are presented in tabular form (Table I).

With the exception of the lowest dosage group (0.00625 mg) the prostates showed a uniform and progressive increase in mean weights with increasing dose. The seminal vesicles showed a relatively greater response to androgens in the 24-hour period. The increase in mean seminal vesicle weight was consistent with the increased dose given.

The mean weights of both prostates and seminal vesicles obtained with 0.5 mg testosterone propionate were significantly greater than those of the controls (critical ratios of 3.36 for the prostates and 4.63 for the seminal vesicles). The mean seminal vesicle weight with 0.1 mg testosterone propionate was also significantly greater than that of the control (critical ratio 3.64) but the mean prostate weight at this dose was not. The differences between the lower dosage groups and the control group were not significant.

TABLE I.

Test. prop. mg	No. animals	M. body wt	M. prost. wt		% increase over cont.	M. sem. ves. wt		% increase over cont.
			mg	σ		mg	σ	
—	21	75.0	45.90	2.38	—	12.08	0.87	—
0.00625	25	74.0	42.62	1.80	—7.14	13.36	0.62	10.59
0.025	20	73.9	47.85	2.22	4.24	14.43	1.06	19.46
0.5	25	73.8	48.23	2.12	5.07	15.15	0.87	25.41
0.10	20	73.5	51.53	2.01	12.26	*16.49	0.83	36.51
0.05	20	74.5	59.95	2.38	*30.61	*18.54	1.08	53.47

σ = Standard deviation of the mean.

* = Significant difference from control mean.

² Astwood, E. B., *Proc. Am. Physiol. Soc.*, 1940, p. 6.

³ Greene, R. R., and Harris, S. C., *PROC. SOC. EXP. BIOL. AND MED.*, 1940, **45**, 34.

† Testosterone propionate (Perandren) furnished by courtesy of Ciba Pharmaceutical Products, Inc.

Within groups the individual prostate and seminal vesicle weights varied considerably. Since the animals used in this procedure also varied in age (32 to 38 days) and in weight (65 to 85 g) it seems probable that some of the intragroup variation in weight of the accessories may be due to these factors. In spite of the intragroup variation, however, the mean seminal vesicle weights in the treated groups showed a fairly consistent direct relationship to the logarithm of the dose as is characteristic of biological responses.

It is possible that a procedure similar to this might be useful as an assay method. The matter of greater accuracy (less group variability), the specificity of the response and the possibility of a shorter time period are being investigated.

Summary. Twenty-four hours after the administration of testosterone propionate to the immature male rat there is an increase in the weights of the prostate and seminal vesicle. This weight increment is proportional to the dosage used.

11833 P

Infusion of Blood and Other Fluids into the Circulation via the Bone Marrow.

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Substances injected into the bone marrow enter the general circulation apparently unchanged and almost as rapidly as when injected intravenously.¹ In the parenteral administration of fluids to adult men it is sometimes impossible to use the intravenous route. Such is the case in widespread mutilations, burns, oedema, poorly developed, obliterated veins, states of shock. In the newborn and in early infancy the venous system is so poorly developed that the superior longitudinal sinus reached through the anterior fontanelle is often the only available direct path to the circulation. The risk of injecting substances through this route is high. These facts seemed to justify an attempt at a wide clinical application in man of the intramedullary route for parenteral therapy. Trial of this route has been carried out in 14 persons. Ten infusions of citrated blood were given by this method to 7 patients, plasma infusions to 2 patients

¹ Tocantins, L. M., *PROC. SOC. EXP. BIOL. AND MED.*, 1940, **45**, 292.