4251

Basal Metabolism (Oxygen) of Normal Women in Relation to Injection of Follicular Hormone.*

J. F. MC CLENDON, GEORGE BURR AND CLAIRE CONKLIN.

From the Laboratory of Physiological Chemistry, University of Minnesota, Minneapolis.

Menformone and estrogen were obtained from the manufacturers. Ovarian hormone was extracted with ether from the urine of pregnant women. Ovariectomized mice were used in assaying the hormone.

In order to secure very accurate measurements, women were placed on weighed diets (no breakfast) and allowed about the same amount of exercise each day and metabolism taken 15 hours after the last meal. The O_2 and CO_2 were determined by the apparatus described in *J. Biol. Chem.*, 1928, lxxvii, 413, the nitrogen determined by micro-Kjeldahl, and, the basal metabolism calculated. By this means the Benedict-Roth-Collins apparatus was tested. The psycho-galvanic reflex, muscle tone, and blood pressure were measured as a check on the physiological state of the subjects. Half the women had basal metabolisms 15% below Aub-Dubois' standard, probably due to deficiency of iodine during childhood. In testing the effects of hormones, it was found that 1 mg. of thyroxine subcutaneously raised the basal metabolism of "normal" women 3% in 2 days and 5 mg. raised it 15% in 2 days. Injections of "menformon" and "estrogen" were made subcutaneously. On days of injection no food was taken and hence the physiological state may not have been considered absolutely constant. The basal metabolism of woman No. 1 was considered too variable for conclusions to be made and the study of her metabolism was discontinued. Women of small vital capacity had more regular breathing than women of large vital capacity.

After injection of 2000-4000 mouse units of ovarian hormone it is excreted in the urine in about 6 hours.

In the first woman the metabolism rose after injection of 300 mouse units and fell after 880 units. In the 2nd woman the metabolism fell after 1000 mouse units. The metabolism of the 3rd woman remained nearly constant all day with no injection, but began to rise 7 hours after injecting 1000 units. The metabolism of

* This research was aided by a grant from the Committee on Therapeutic Research, Council on Pharmacy and Chemistry, American Medical Association.

TABLE I.

Woman	No. of mos met. was studied	Day	Hour	Cal. per sq. m per hr.	Injection mouse units
1	1	1	1	30.0	
		2	1	—	150- 300
			5	31.7	
			5¼	35.2	
		3	1	—	440- 880
			1½	31.9	
			2	30.9	
			4¼	30.0	
2	4	1	1	35.5	
		2	0	35.8	
			1	—	500-1000
			2	34.4	
			4	34.4	
			6	34.1	
			8	33.7	
		2	1	30.5	
3	4	1	1	31.0	
			3	30.1	
			5	29.6	
			7	30.6	
			8	31.3	
			9	32.8	
		2	0	32.4	
			1	—	500-1000
			1½	32.4	
			2	30.7	
			3	32.2	
			4	31.7	
			5	32.8	
			6	32.8	
			7	34.2	
			7½	35.0	
			7¾	35.6	
		3	1	32.7	
4	2	1	1	35.0	
		2	0	35.0	
			1	—	1000-2000
			2	34.0	
			3	35.2	
			8	38.0	
			9	37.1	
		3	1	35.9	
5	2	1	1	31.8	
		2	0	32.1	
			1	—	2000-4000
			3½	32.4	
			4	33.5	
			5	32.6	
			6	33.0	
		3	1	31.6	

the 4th woman rose after injecting 2000 units. The metabolism of the 5th woman remained nearly constant after injecting 4000 mouse units.