THE EFFECT OF THE MATERNAL INGESTION OF DESICCATED PLACENTA UPON THE RATE OF GROWTH OF BREAST-FED INFANTS.

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(Received for publication, October 8, 1918.)

During a series of experiments designed to show whether or not the maternal ingestion of desiccated placenta would have an effect upon the chemical composition of the milk produced during the early stages of lactation,[1, 2] a comparison of the growth of the infants feeding upon the milk produced during its administration with the growth of those subsisting upon milk from mothers who had not been given the material,[3] led to the idea that the feeding of this substance to the mothers had an effect upon the rate of growth of their breast-fed infants entirely aside from the per cent change in the determined constituents.

Since the number of observed cases was too small to give more than the indication of a tendency, I decided to make a more extensive study of the matter, in order to determine definitely whether placenta tissue *per se*, when fed to nursing mothers, contains a substance or substances affecting the rate of growth of the breast-fed infants, it being a well known fact that milk may contain as such, or slightly changed, various substances, ordinarily foreign to its make-up, ingested by the mother.

The cooperation and courtesy of the staff and nurses of the Boston Lying-In Hospital made possible the carrying out of this plan, and the following is a brief report of the results.

In order to avoid complications in recording, all patients were given the desiccated placenta prepared as described in an earlier publication,[2] and in the same dosage, *e.g.* 10 grains in capsules,

[1] Hammett, F. S., *J. Biol. Chem.*, 1917, xxix, 381.

[2] Hammett, F. S., and McNeile, L. G., *J. Biol. Chem.*, 1917, xxx, 145.

[3] Hammett and McNeile, *Science*, 1917, xlvi, 345.

t.i.d. From these, only those mothers were chosen whose parturition course was normal, and only the weights of those infants are utilized whose sole source of nourishment was the maternal breast. The diet of the mothers and the method of weighing of the infants were the same as reported in the paper on the normal growth capacity of infants at this Hospital,[4] thus standardizing the experimental conditions for a study of this type.

In view of the results obtained in a study of the relationship between weight at birth and growth capacity,[4] and for purposes of comparison, the subjects of this experiment were also divided

TABLE I.

Comparison with the Normal of the Per Cent Change in Weight from the 1st Day of Infants Subsisting upon Milk Produced under the Influence of Maternally Ingested Desiccated Placenta.

Group.	Weight.	Day.											
		3		5		7		9		11		13	
		Placenta.	Normal.	Placenta.	Normal.	Placenta.	Normal.	Placenta.	Normal.	Placenta.	Normal.	Placenta.	Normal.
	lbs.												
A	5–6	−3.1	−4.0	−1.2	−3.3	0.6	−0.4	4.7	1.4	8.8	3.9	12.5	6.0
B	6–7	−4.1	−4.7	−2.1	−3.2	0.4	−1.1	3.0	0.9	5.2	2.8	7.9	4.4
C	7–8	−3.7	−4.4	−2.7	−2.7	0.1	−1.1	2.3	1.0	4.3	2.7	5.9	4.6
D	8–9	−4.5	−5.1	−3.0	−3.8	−1.3	−2.4	0.3	−0.6	2.0	0.9	3.3	2.1
E	9–10	−4.5	−7.2	−4.8	−7.1	−3.3	−5.9	−3.0	−4.7	−1.7	−4.0	−1.1	−2.9
F	10–11	−5.4	−7.4	−5.6	−7.3	−3.5	−6.4	−0.9	−5.6	0.9	−4.7	1.5	−3.6

into six groups according to weight at birth; and the weights recorded on the 1st, 3rd, 5th, 7th, 9th, 11th, and 13th days after birth were utilized for the data presented. The growth of 177 infants was studied during this period.

In Table I is given a comparison of the per cent change in weight of the two general sets of subjects. Fig. 1 is a graphic representation of the mean curve of each set.

The effect of the ingestion of the desiccated placenta by the mothers on the rate of growth of the breast-feeding infants is at

[4] Hammett, *Am. J. Physiol.*, 1918, xlv, 396.

once apparent. In each group not only is the postnatal decline in weight less in amount, but also the gain in weight after the preliminary loss is greater in every case on every day than that recorded for the normal groups, the mean increase over the normal per cent change in weight on the 13th day being over 60 per cent.

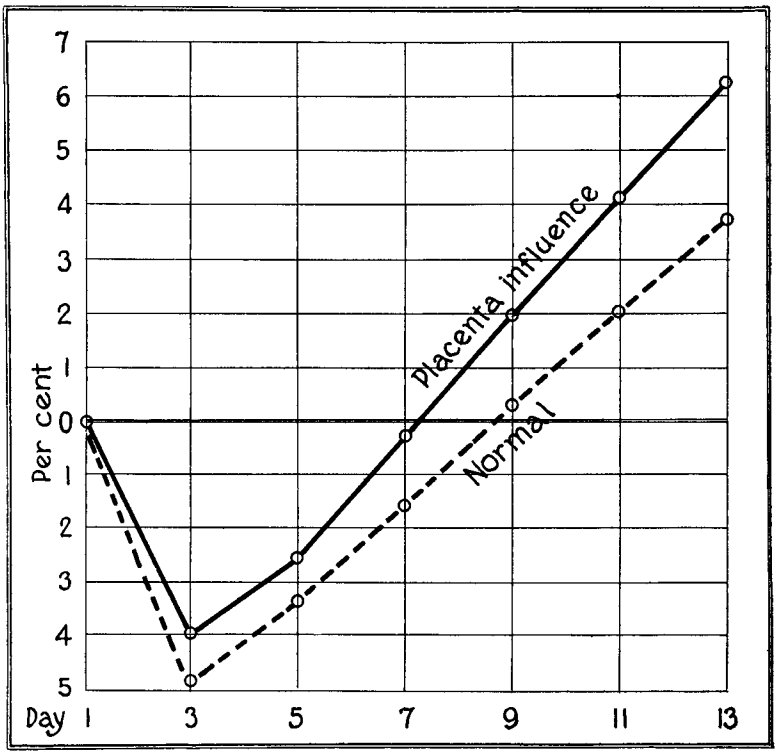

FIG. 1. Curves showing mean of per cent change in weight from 1st day of two sets of infants.

Supplementing these facts with an examination of Table II conclusively demonstrates that the rate of growth of breast-fed infants is enhanced by the maternal ingestion of desiccated placenta, for not only is the recovery to or over the initial weight generally more rapid, but the weight is almost uniformly greater.

The growth capacity of infants subsisting upon the milk produced during the administration of desiccated placenta is also increased. This is shown in Table III. That is to say, the maternal ingestion of dried placenta tissue so stimulates the tissues of the infants feeding upon the milk produced during this time,

TABLE II.

Comparison of the Per Cent Recovery to or over the Initial Weight of the Two Sets of Infants.

Group.	Weight.	Day.											
		3		5		7		9		11		13	
		Placenta.	Normal.	Placenta.	Normal.	Placenta.	Normal.	Placenta.	Normal.	Placenta.	Normal.	Placenta.	Normal.
	lbs.												
A.	5–6	17	19	17	29	58	50	83	62	100	75	100	82
B.	6–7	12	8	36	24	50	45	71	60	79	75	95	80
C.	7–8	0	12	27	24	54	39	78	60	87	74	89	78
D.	8–9	5	17	17	17	40	30	60	49	70	60	79	70
E.	9–10	0	2	22	5	33	15	33	20	33	30	55	35
F.	10–11	0	3	0	3	25	5	50	8	75	11	75	20

TABLE III.

Comparison of the Growth Capacity of the Two Sets of Infants.

Group.	Weight.	Increment from 3rd day.		Capacity.	
		Placenta.	Normal.	Placenta.	Normal.
	lbs.	*per cent*	*per cent*	*per cent*	*per cent*
A.	5–6	15.6	10.0	2.836	1.818
B.	6–7	12.0	9.1	1.846	1.400
C.	7–8	9.6	9.0	1.280	1.200
D.	8–9	7.8	7.2	0.918	0.847
E.	9–10	3.5	4.3	0.369	0.453
F.	10–11	6.9	3.6	0.657	0.343

that unit weight is able to add on greater increments of matter, from day to day, than can unit weight of infants feeding on milk from mothers not ingesting this substance.

A large series of comparative measurements of the mammæ of women taking and not taking the desiccated placenta, combined

with a study of the time of onset of full milk production, failed to show either hypertrophy of the gland or an increased milk production on the part of those women ingesting the placenta material. In view of these facts, and having in addition evidence that the increased food value of the milk produced during the administration of the dried placenta cannot compensate for the increased growth of itself,[2, 3] and moreover since but 30 grains, or less than a gram, of the dried material was fed each day, a quantity so small as to be negligible as matter from which new tissue can be built, we conclude that there must be contained in the desiccated placenta some substance, or substances, capable of passing through the maternal organism with at least a part of its activity retained. Being secreted by the mammary glands, it is passed on to the infant in the milk, there acting as stimuli to growth. It is not illogical to suppose that these substances in the placenta *in utero* may play an important part in the growth of embryo and fetus.

CONCLUSION.

The maternal ingestion of desiccated placenta produces an increase in the rate of growth and growth capacity of the breast-fed infants above that normally occurring. This is due to the presence in the placenta of some, as yet unidentified, growth-promoting substance.