

Increase in the active transport of glucose through the intestine during pregnancy

A well known factor of the physiological adaptation to pregnancy, is the increase in ingestion of foods as a result of the stimulation of the lateral nuclei of the hypothalamus.

From a teleological point of view, one might think that along with this increase in ingestion, an increase in the absorption capacity through the intestine would occur. In this sense it is in fact known that iron is absorbed more rapidly during pregnancy and proportionally to the development and activity of the foetus in hematopoietic organs (1).

Nevertheless, it does not appear that the influence that pregnancy could have upon the velocity of intestinal absorption of the necessary plastic or energetic substances has been sufficiently studied.

Therefore in this paper the effect that pregnancy has upon the absorption of d-glucose, one of the substances of greatest active transport, is reported. Other experiments dealing with the absorption of glycine are in progress.

The Sols and Ponz technique *in vivo* of successive absorptions has been employed as in previous studies (2).

A lot of 36 white Wistar rats, weighing from 180 to 200 grams and 12 to 15 days pregnant, and another a lot of 36 rats of the same characteristics but not preg-

nant, were perfused with solutions of 300, 150, 75 and 20 mM of glucose with pressure of 12 cm. of water during 30 minutes. In each animal four successive absorptions were carried out.

In table I the average values for both types of experiments are indicated with their corresponding standard errors.

The results show a very significant increase ($P < 0,01$) in the absorption of glucose in the pregnant rats that of the control.

TABLE I

Influence of pregnancy on the absorption rate of d-glucose through the intestine of rats in vivo, time of absorption 30 minutes.

N.º	Glucose mM	Intestinal absorption $\mu\text{M}/\text{cm}$
Not pregnant		
8	300	$43,3 \pm 0,8$
9	150	$20,0 \pm 0,05$
12	75	$13,0 \pm 0,02$
7	20	$5,0 \pm 0,09$
Pregnant		
9	300	$52,1 \pm 0,5$
10	150	$26,1 \pm 0,7$
10	75	$16,8 \pm 0,2$
7	20	$7,0 \pm 0,4$

This increase is observed with all the concentrations of glucose, amounting 21 % for 300 mM, and 40 % in those of 20 mM.

Similar results have been found for glycine (3) This increase observed in the absorption rate is another example of the modification of the active transport of glucose through the intestine in different functional states such as diabetes (4), fasting (5), hypertyroidism (6), etc., and these results suggest furthermore, that in the maintenance of homeostasis of certain body constituents it is necessary to take into account this activity of the intestinal mucosa, in addition to the increased ingestion and other variations of the digestive system.

References

- (1) SHORR, E. : *Harvey Lect.*, **50**, 258, 1955.
- (2) LARRALDE, J., BELLO, J. and FERNÁNDEZ-OTERO, P. : *R. esp. Fisiol.*, **18**, 127, 1962.
- (3) LARRALDE, J. and GONZÁLEZ, M. : Unpublished results.
- (4) SOLS, A., VIDAL, S. and LARRALDE, J. : *Nature*, **115**, 168, 1948.
- (5) LARRALDE, J. : *R. esp. Fisiol.*, **3**, 31, 1947.
- (6) LEVINE, A., NEWBY, H. and SMITH, H. : *J. Physiol.*, **169**, 755, 1963.

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