LACTASE EXPRESSION IN NEONATAL RATS

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Under normal conditions, foetal lactase expression is detectable from the third trimester of gestation in rats. This expression is associated with rapid structural and morphological changes in small intestinal mucosa (Reusens-Billen et al. 1989). Therefore, we hypothesised that the nutritional supply to the rapidly developing foetus could have a crucial influence on the development of small intestinal physiology, as indicated by lactase expression, during the prenatal period of life.

Pregnant Wistar rat dams (250-300g) were randomly divided into two groups. A control group which was allowed an ad libitum standard rat diet during the entire gestation period (21 days). From day 14 of gestation the second group received 50% of the control food amount given the day before. On the first day after birth, six pups were collected from each dam and injected with an overdose of pentabarbitone sodium. Specimens of the small intestinal mid-region were collected under 4°C and frozen with OCT embedding material in liquid nitrogen. Cryostat sections were subjected to immuno-cytochemistry staining using specific antibodies against lactase. Lactase expression was studied in five equal zones along the crypt-villus axis using the computer image analysis program Video Pro 32 adjusted for densitometric measurements. Data in the Table are presented as absorbance mean values ± SEM. Values of three restricted and four control litters were analysed for significance by the Student's t-test. Although the undernourished pups showed higher lactase expression in all five villi zones, the differences between the two groups were not significant (NS).

Table. Lactase expression in five crypt-villus zones (absorbance, mean ± SEM)

	I	II	III	IV	V
Undernourished	0.23 ± 0.03	0.38 ± 0.04	0.44 ± 0.03	0.45 ± 0.01	0.43 ± 0.02
Control	0.13 ± 0.003	0.22 ± 0.003	0.26 ± 0.002	0.29 ± 0.004	0.34 ± 0.007
Significance	NS	NS	NS	NS	NS

The morphology of small intestine has been previously shown to be affected by the prenatal undernutrition (Firmansyah et al. 1989). In this study, however, restricted feeding did not affect the neonate's small intestine capacity to express a sufficient amount of lactase. Consequently, animals that were prenatally undernourished may have adequate capacity to digest milk lactose under the normal nutritional conditions of mothers.

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