

THE EFFECT OF PRENATAL TREATMENT WITH B-HYDROXY-B-METHYLBUTYRATE ON THE SMALL INTESTINE MORPHOLOGY IN A MINK MODEL

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The development of gastrointestinal tract as well as nutrition decides on a health status and the growth of an organism. The fetal life is one of the most critical stage of development and can be subjected to regulation by hormones and nutritional status. There is a search for methods or substances which would improve the health status of the digestive system. One of such substances may be β -hydroxy- β -methylbutyrate (HMB) which plays a key role in animal metabolism as a metabolite of leucine. Dietary supplementation with HMB improved bone and dental development, immune function and health status as well as increased the fat content of milk in lactating animals. Recent studies also showed a positive impact of prenatal administration of HMB on postnatal growth and development. Thus the aim of this study was to elucidate the effect of maternal HMB treatment on the development of selected morphological parameters of small intestine of mink offspring.

The study was performed on 40, clinically healthy, 8 months old offspring of 14 primiparous, 10 months old, American minks (*Neovison vison*) of the standard dark brown type. The following morphometric variables in the intestine were analyzed: mucosa, submucosa, and myenteron thickness, crypt depth and width; the number of crypts; villar length and thickness; the number of villi; small intestine absorptive surface.

Although prenatal treatment with HMB did not exert strong effect on examined parameters of the histological structure of duodenum, significant increase of absorptive

surface was noticed in females comparing to control. On the other hand male offspring of mothers treated with HMB had thinner mucosa, submucosa and myenteron, shorter and wider villi as well as narrower and deeper crypts, although not significantly. Almost opposite situation was noticed in female offspring, where villi were longer and thinner, and crypts were deeper, as well as moderate effect on myenteron.

HMB given to pregnant minks affected structure of small intestine of their offspring. Which is of importance, the effects of prenatal treatment were observed after relatively long period of growth. Besides, to some extent the effect of HMB was gender dependent since greater changes were observed in female offspring. Additionally the most important aspect was the strong increase of absorption surface of duodenum observed in females. This increase was evident although there was no change in number of villi and crypts between the HMB and the control group. Thus one may speculate that anabolic effect of administered substance was evident. HMB administered in the diet of pregnant minks accelerated later development of duodenal mucosa of their offspring. Although there was no observed symptoms of diarrhea, dehydration or intestinal infections it can be speculated that observed changes in the structure of duodenal wall could lower the risk of such diseases. Obtained results are promising in the view of the use of HMB as a feed additive in intensive breeding, where it is of importance for the welfare of animals and their productivity. More detailed studies are necessary to elucidate further the effects of HMB in other organs and systems especially prenatal effects of this substance.

Keywords: PRENATAL TREATMENT, SMALL INTESTINE, MORPHOLOGY, MINK MODEL.