
MORPHOLOGICAL CHARACTERISTICS OF THE SMALL INTESTINE DURING ABSORPTION IN THE EARLY POSTNATAL PERIOD OF LIFE.

N.F.Ashurova, Z.T. Makhmudova

Tashkent City Emergency Medical Care Clinical Hospital,
Uzbekistan

ABSTRACT: The article studies the features of the process of breast milk absorption in the early postnatal period. The material of the study was outbred white rats, which were on different types of feeding. The process of absorption in the small intestine is universal and proceeds almost identically up to 14 days after birth when breastfeeding.

KEYWORDS: library, PubMed/MEDLINE, ScienceDirect, EBSCO, for the period from 2010 to 2024, which were found using the keywords “Nutrition, absorption, breastfeeding, enterocyte, hydrolytic enzymes”.

INTRODUCTION

In mammals and humans, the mucous membrane of the small intestine and its immune system begin to form before birth, their final formation occurs after birth at the time of transition to final nutrition [1,2,]. At the time of birth, the intestinal immune system is presented in the form of accumulations of mesenchymal cells under the epithelium, from which the reticular stroma is initially formed, and then single lymphocytes and their precursors from the vascular bed populate it. The lymphoid tissue of the mucous membrane of the small intestine in this period does not have characteristic features for a sexually mature organism [3,4,8,11,17].

Currently, large-scale studies are being conducted to study the formation of the immune system of the mucous membrane of the small intestine and its adaptive reactions in postnatal ontogenesis. Such studies include this research work, which studies the morphological, morphometric, ultrastructural features of development and formation, proliferation and migration parameters of the epithelium of the small intestinal mucosa in the dynamics of age in germ-free rats and in sterile rats associated with some representatives of the normal intestinal microflora - lactobacilli. This work also studied the relationship and integration of epithelial cells of the small intestinal mucosa and its immune system. These studies make it possible to evaluate the morphological, morphometric and ultrastructural features of the development and formation of the stomach, small and large intestine in intact rats.

RESULTS

When germ-free rats are born, the small intestine, like all newborns, is considered sterile. Macroscopically, the small intestine is short and of small diameter. The wall consists of mucous,

submucosal, muscular and serous membranes.

The mucous membrane throughout the small intestine has not yet been formed: only the emerging villi are short, dome-shaped, lined with highly prismatic enterocytes (EcT). Crypts are either minor depressions formed by accumulations of poorly differentiated epithelial cells (EC) between the bases of the villi, or a short epithelial cord with a barely visible lumen.

Epithelial cells of the small intestine complete their life cycle, as a rule, at the top of the villi. Before extrusion, the matrix is cleared, the cytoplasm is structureless in places. Individual mitochondria may become denser or swell. The length of the organelle membranes sharply decreases, the terminal network in the apical part of the cells is fragmented, and the microvilli undergo vesiculation. At the same time, there is a decrease in the viscosity of the basement membrane, an increase in T-lymphocytes in the epithelial layer, lysis of desmosomes and the tight junction complex.

CONCLUSION

Extrusion represents the process of separation of the enterocyte from the surface of the basal plate and movement towards the lumen of the organ. The resulting space with a width of 10.0 microns on average is eliminated almost instantly due to the convergence of the plasma membranes of adjacent viable epithelial cells from bottom to top. In the space between adjacent cells or under the base of the extruding epithelial cell, T lymphocytes are usually identified in 90%. A destructively changing cell appears to be the cause of increased transport of antigen-significant substrates from the intestinal lumen and disruption of homeostasis. Food and its most essential component - microorganisms (indigenous, pathogenic and conditionally pathogenic) - on average 30 minutes after consumption cause leukocytosis in the circulating blood, in the mucous membrane of the stomach, proximal part of the small intestine an increase of up to 30% on average of lymphocytes, infiltrating mainly epithelial layer of villi.

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