

MORPHOLOGICAL CHANGES IN THE APPENDIX IN EXPERIMENTAL NICOTINE-ALCOHOLIC INTOXICATION

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Annotation

During postnatal development, the intensity of glandular-lymphoid relationships in the walls of the cecum changes. Both in and near the cecal-ascending sphincter, lymphoid nodules are occasionally detected near the colonic glands during the neonatal period (approximately 15-20% of histological specimens). Diffuse lymphoid tissue near the glands during this period is determined by the presence of isolated lymphoid cells located near the basal portion of the glands. This article focuses on age-related morphological changes in the cecum in experimental nicotine-alcohol intoxication.

Keywords: morphology, cecum, body composition components, cachexia, obesity.

МОРФОЛОГИЧЕСКИЕ ИЗМЕНЕНИЯ СЛЕПОЙ КИШКИ ПРИ ЭКСПЕРИМЕНТАЛЬНОЙ НИКОТИНОВО-АЛКОГОЛЬНОЙ ИНТОКСИКАЦИИ

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Аннотация

На протяжении постнатального онтогенеза изменяется интенсивность железисто-лимфоидных взаимоотношений в стенках слепой кишки. Как в зоне слепокишечно-восходящеободочного сфинктера, так и рядом с ним, в период новорожденности возле толстокишечных желез лишь эпизодически выявляются лимфоидные узелки (примерно у 15-20% гистологических препаратов). Диффузная лимфоидная ткань рядом с железами в этот возрастной период определяется в виде единичных лимфоидных клеток, располагающихся возле базальной части желез. Данная статья посвящена на возрастные морфологические изменения слепой кишки при экспериментальной никотиново-алкогольной интоксикации.

Ключевые слова: морфология, слепая кишка, компоненты состава тела, кахексия, ожирение.

Relevance. Malignant tumors arising from the glandular epithelium of the cecum are one of the most common forms of cancer in this part of the digestive tract, representing a serious medical and social problem. The lack of clarity regarding the morphogenesis of the cecal glands, their individual characteristics, and age-related dynamics during normal functioning of the organ complicates the understanding of many problems associated with colon pathology. At the same time, this issue is the focus of close attention by gastroenterologists, geriatricians, and other clinicians.

During postnatal ontogenesis, the intensity of glandular-lymphoid relationships in the walls of the cecum changes. Both in and near the cecal-ascending sphincter, lymphoid nodules are occasionally detected near the colonic glands during the neonatal period (approximately 15-20% of histological specimens). Diffuse lymphoid tissue adjacent to the glands at this age is characterized by isolated lymphoid cells located near the basal portion of the glands. The connective tissue layers separating adjacent glands contain only isolated lymphocytes (primarily small and large lymphocytes), with the distance between them varying from 25 to 55 μm . Such insignificant contacts between the glands and lymphoid tissue at this age are likely due to the monotonous diet during the neonatal period (breastfeeding) and the limited variety of environmental exposures. In adults, by contrast, exposure to environmental factors is varied, due to both varied diets and unhealthy habits. Lymphoid tissue in individuals aged 22-25 is consistently found in close proximity to the glands. Lymphoid nodules, which appear round or oval in histological preparations, are always found near their basal portions. More than 85% of these lymphoid nodules have proliferation centers, whose area on histological section ranges from 25 to 50% of the lymphoid nodule itself. These proliferation centers are dominated by small lymphocytes (up to 45% of all cells), along with reticular cells (15.5%), plasma cells (2.5%), and macrophages. Medium-sized lymphocytes and plasmablasts are rarely detected in the proliferation centers, and eosinophils are always absent. Diffuse lymphoid tissue is also always found near the glands. Lymphoid cells form chains near the base and basal portion of the glands. The distance between these lymphoid cells does not exceed 5-7 μm ; clusters of 3-5 lymphoid cells (mainly small lymphocytes or small lymphocytes and a macrophage) are sometimes observed.

In addition to local immunity, intestinal lymphoid tissue is functionally integrated into the overall human immune system [1]. The immune system influences the nervous and endocrine systems through feedback [2], thereby acting as a general regulatory system. The development of lymphoid structures and their number change with age [3–4]. The number of these structures in the walls of various sections of the colon [3, 5–6] and their response to stimuli [7–9] have been established. Intercellular relationships and the quantitative composition of immunocyte populations in the lymphoid structures of the intestinal wall, as well as their age-related restructuring, remain poorly understood.

A study of the human cecal mucosa revealed that the structure of its lamina propria remains unchanged over a long period (21–60 years). A slight decrease in the number of plasma cells was noted, the proportion of which decreased by 1.3 times (from 28.93% to 21.81%) in the second period of adulthood. According to the literature, this also leads to a decrease in the production of secretory immunoglobulin A. Compared with other sections of the intestine, the processes occurring in the walls of the cecum differ significantly from the age-related changes in the walls of the small intestine. In the duodenum, age-related changes are more pronounced and are accompanied by a twofold decrease in the number of plasma cells, while in the ileum, on the contrary, the number of these cells increases in the second period of adulthood. In the lymphoid nodules of the cecum in individuals of the studied age groups, the cellular composition changes to a greater extent than in the lamina propria of the organ's mucosa. These changes are primarily associated with the accumulation of small lymphocytes in all examined areas. They are found 1.8 times more frequently at the apex of the lymphoid nodule than in individuals in the first period of maturity, 1.36 times more frequently at the base, and 1.1 times more frequently in the central zone. This is apparently due to a weakening of plasma cell differentiation processes in the lymphoid tissue of the cecal walls and a more active migration of lymphocytes into the organ mucosa with age. Our data indicate a lesser effect of age on the cecum compared to other parts of the intestine, where an increase in the number of fibroblast cells is observed, indicating an increase in sclerotic processes in the organ. In the walls of the cecum, an increase in the number of stromal cells in the second period of maturity is observed only in lymphoid nodules: in the central zones (germination centers) and slightly in the basal zone. This process coincides with a significant decrease in the number of plasma cells (by 1.65 times) in the germination centers. A similar pattern is observed in the basal zone of the lymphoid nodule, where the plasma cell content decreases by 1.74 times. In the apical zone of the lymphoid nodule, the number of plasma cells remains unchanged, but the proportion of plasmablasts decreases. As in the lamina propria, the process of plasma cell formation in lymphoid nodules slows with age. Regarding cellular proliferation, it is virtually absent in the lymphoid nodules of the cecum, despite the presence of blasts and large lymphocytes in the proliferation centers, as well as large lymphocytes at the base and apex of the nodule in both age groups.

Cellular exchange in the lymphoid structures of the cecum is accomplished through active cell migration, as evidenced by the presence of venules in the lymphoid nodules, which are capable of altering their functional activity. In this regard, lymphoid cell renewal in the cecal wall differs from that in the human small intestine, where cell proliferation in the lymphoid nodules occurs quite actively in all age groups. All cellular changes occurring in the lymphoid nodules of the cecum and its mucosa result in an age-related decrease in plasma cell levels and, consequently, a

weakening of immune surveillance in the walls of this section of the intestine by adulthood.

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