CELLULAR COMPOSITION OF LYMPHOID STRUCTURES OF THE APPENDIX MUCOSA IN ADULTS

Murtazaev Nodirjon Ismatovich

Bukhara State Medical Institute named after Abu Ali Ibn Sina, A. Navoi Street, Bukhara, Uzbekistan.

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

A study of the mucosa of the human cecum 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 is noted, with their proportion decreasing by 1.3 times (from 28.93% to 21.81%) in the second period of adulthood. According to literature, this also leads to a reduction in the production of secretory immunoglobulin A. Compared to other parts of the intestine, the processes occurring in the walls of the cecum differ significantly from the age-related restructuring in the walls of the small intestine. In the duodenum, age-related changes are more intense and are accompanied by a twofold decrease in the number of plasma cells, whereas in the ileum, by contrast, the number of these cells increases in the second period of adulthood. In the lymphoid nodules of the cecum in individuals in the age groups studied, 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 studied areas. For example, they are found 1.8 times more frequently in the apex of the lymphoid nodule than in individuals in the first period of adulthood, 1.36 times more frequently in 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 cecum's walls and a more active migration of lymphocytes into the organ's mucosal tissue with age. Our data indicate a lesser influence of age on the cecum compared to other intestinal regions, where an increase in the number of fibroblastic cells is observed, indicating an intensification of sclerotic processes in the organ. In the cecum walls, an increase in the number of stromal cells in the second period of adulthood is observed only in the lymphoid nodules: in the central zones (germination centers) and slightly in the basal region. 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 region of the lymphoid nodule, where the plasma cell content decreases by 1.74 times. In the apical region 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 the lymphoid nodules also slows with age. Regarding cell proliferation, it is virtually absent in the lymphoid nodules of the cecum, despite the presence of blasts and large lymphocytes in the proliferation centers and large lymphocytes at the base and apex of the nodule in both age groups. Cellular exchange in the lymphoid structures of the cecum occurs through active cell migration, as evidenced by the presence of venules in the lymphoid nodules, which are capable of changing their functional activity. In this regard, lymphoid cell renewal in the walls of the cecum differs from that in the human small intestine, where cell proliferation in lymphoid nodules is quite active in all age groups. All cellular changes occurring in the lymphoid nodules of the cecum and its mucosa are reduced to an age-related decrease in the plasma cell content and, consequently, to a weakening of immune surveillance in the walls of this section of the intestine by adulthood.

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