Morphological characteristic and functional dependencies of dendritic cell in developing rabbit lung during fetal and neonatal life

Doaa M. Mokhtar *, Marwa M. Hussein

Abstract:

Recently, pulmonary DC deserved the attention of researchers and clinicians as it was implicated in many diseases afflicting human lungs. However, there are no available data about the morphological or functional features of pulmonary dendritic cells in fetal or early neonatal life. The present study aimed to demonstrate the morphological development of DCs using light-, electron-microscopy, and immunohistochemistry. DCs showed strong immunoreactivity for both CD8 and CD56. Moreover, DCs strongly expressed CD34, VEGF, NSE, and connexin-43 within the developing pulmonary tissue. By SEM, DCs were polyhedral in shape with short cell processes in fetal life. By the advancement of the age, DCs became more numerous and exhibited rounded to oval cell bodies with many fine dendrites. TEM revealed that at early fetal life, DCs were characterized by their heterochromatic indented nuclei, few cell processes and few organelles. With the advancement of age, DCs showed dendrite-like processes and displayed signs of high endocytic activities with releasing of secretory materials. At late fetal life, DCs showed an obvious increase in the nuclear/cytoplasmic ratio and they exhibited a unique connection with type II pneumocytes and pulmonary endothelium by gap junction. In the early neonate, the DCs cells were seen in association with T-lymphocytes, neutrophils, telocytes (TCs), and air-blood barrier. They possessed many fine dendrites, the characteristic Birbeck granules and many vesicles. DCs may contribute to apoptosis, endocytosis, and angiogenesis. The difference in the maturation status may reflect different roles for DCs in the lung. The immature DCs may have an antigen-uptake role through endocytosis, while mature DCs may involve in antigen presentation to T-cells.

Keywords:

CD8 Ultrastructure Telocytes CD34 Lymphocytes Antigen-presentation

Published In:

Developmental Biology , NULL , NULL