Distribution of fibroblasts and fibrocytes in the joint capsule during the postnatal period in norm and after antenatal antigenic stimulation.

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Introduction:

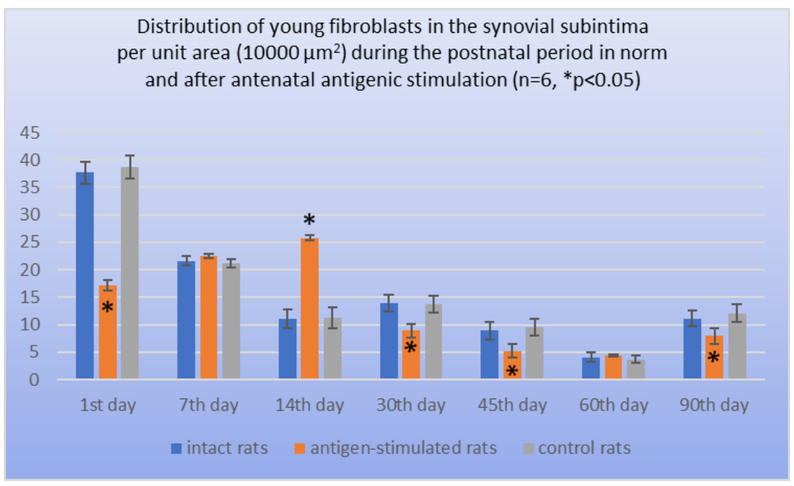
- Fibroblasts and fibrocytes are inherent components of connective tissues. They take part in the innate response, angiogenesis, extracellular matrix turnover to provide tissue development, differentiation, remodelling, and repair. During joint inflammation, they contribute to disease pathology [Galligan et al. 2010; Marsh et al. 2021].
- During pregnancy, the fetus can be exposed to antigens, which may affect child's organs, in particular joints.
- We studied joint capsule morphology during the postnatal period in norm and after antenatal antigenic stimulation.

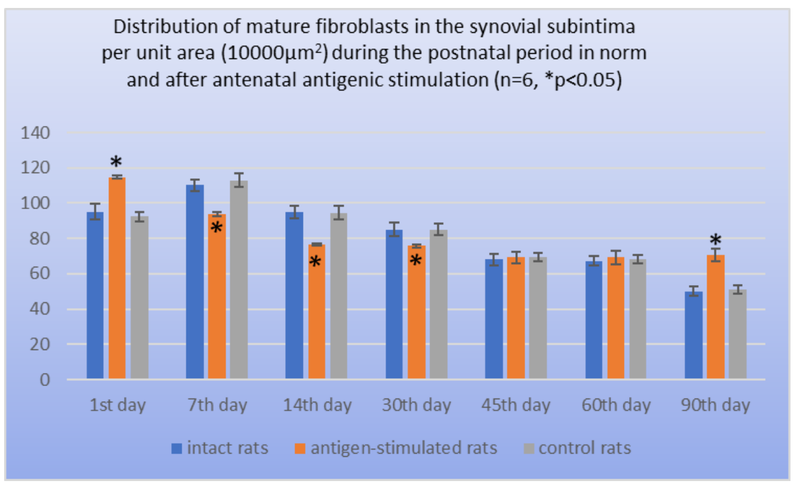
Methods:

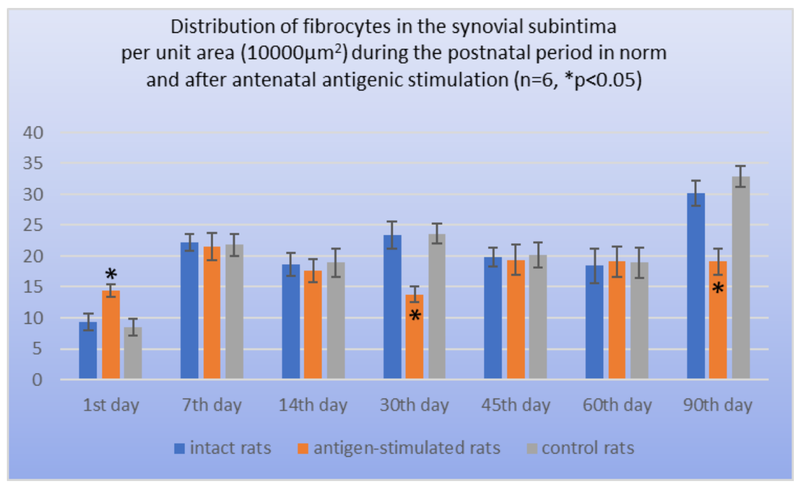
- The antigen (0.05 ml of human normal immunoglobulin) and physiological saline (0.05 ml for the control group) were injected transuterinely subcutaneously in the interscapular region of the rat fetus on the 18th day of its antenatal life via laparotomy for the pregnant female rat (Voloshyn's method).
- Collection of the biomaterial was carried out on the first, seventh, 14th, 30th, 45th, 60th and 90th day of postnatal life (intact, antigen-stimulated and control rats; six rats in each group, 126 in total).
- Formalin-fixed joints were decalcified, dehydrated, embedded in paraffin, stained with hematoxylin and eosin.
- The synovial subintima cells were counted using the morphometric lattice and statistically processed (significance at $p<0.05$).
- The parameters of intact and control rats did not differ significantly from each other.

Results:

- The maximum number of young fibroblasts in intact rats was observed on the first day, in antigen-stimulated – on the 14th day.
  In antigen-stimulated rats, it was more on the 14th day, and less on the first, 30th, 45th and 90th day compared to intact group.
- The maximum number of mature fibroblasts in intact rats was observed on the 7th day,
  in antigen-stimulated – on the first and 90th day.
  In antigen-stimulated rats, it was more on the first and 90th day, and less from the seventh to 30th day, related to intact rats.
- The maximum number of fibrocytes in intact was observed on the seventh, 30th and 90th day,
  in antigen-stimulated – on the seventh, and from the 30th to 90th day.
  In antigen-stimulated rats, it was more on the first day, and less on the 30th and 90th day compared to intact rats.







Conclusion:

- The distribution of fibroblasts and fibrocytes, regardless of antigenic influence, had an undulatory pattern.
- Changes in the distribution of fibroblasts and fibrocytes would influence cell-cell and cell-matrix interactions, affecting the structure and functional properties of the joint capsule and might cause at least subclinical pathological changes in it during childhood and adolescence.

ЗАПОРІЗЬКИЙ ДЕРЖАВНИЙ МЕДИЧНИЙ УНІВЕРСИТЕТ

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