The radiological, osteodesitometrical and inflammatory parameters aspects in experimentally induced chronic arthritis

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ABSTRACT

Introduction. Chronic inflammatory rheumatic diseases currently comprise over 250 diseases mainly affecting young people and are accompanied by a high degree of physical and mental disabilities. Despite numerous attempts to identify the etiology, they still remain unknown. They were incriminated many factors: genetic, environmental, endocrinological, infectious - without specifying exactly what agent could trigger the disease. In the evolution of joint destruction were highlighted three stages: inflammatory synovitis, osteochondral destruction and fibrosis. Methods: Based on these preliminary data, the paper has proposed to make an experimental model of chronic arthritis in laboratory animals - rats Wistar, young and adults - and determine the dynamic evolution of radiographic, osteodensitometry and inflammatory parameters. Results. Young animals have presented higher radiological scores compared with the adults; parameters of bone densitometry (T-score and Z, DEXA, BMD) at the beginning and at the end of the experiment indicated a higher level of bone destruction in group of young animals compared to the adult, while inflammatory parameters (fibrinogen, cervuloplasmina, uric acid) were equal for both groups of animals. Conclusions. Osteodensitometrical, radiological and laboratory parameters constitute the basic indicators in assessing inflammatory diseases, highlighting the intensity of the destructive osteo-articular phenomena.

Keywords: arthritis, DEXA, RX.

Introduction

Radiological parameters (radiological scores Sharp, Van der Heyde, Larsen) used in the quantitative assessment of bone and cartilage destruction in RA were adapted to an experimental model of arthritis in laboratory animals - being used rats of the Wistar, young and adult female, considering that inflammatory diseases mainly affects female subjects and have a more severe evolution in young compared to adult patients.

Osteodensitometry parameters: DEXA, respective T and Z scores, BMD (Bone Mineral Density) they also can identify the changes in bone mineral density, bone loss being correlated with the local synovitis.

Inflammatory parameters were determined in the dynamic throughout the experiment.

Material and method. The experimental study was conducted over a period of eight weeks, on Wistar rats young and adult female, which was induced arthritis by injecting tibial-femoral joint with 1% carrageenan, 0.02 ml, 3 times/week. The animals received standard food and were properly hydrated. During the experiment, the fibrinogen, cervuloplasmin and uric acid levels were determined in the dynamic. Radiological examination was conducted in Semiologically and Radiology Clinic (leader prof. dr. Vasile Vulpe) of University of Agricultural Sciences and Veterinary Medicine "Ion Ionescu de la Brad" Iasi, and the bone densitometry at the Endocrinology Clinic.
of University Hospital „St. Spiridon” Iasi - using Helicon 100 (made in USA).

**Results.** Regarding on Larsen radiological scores valid to human (0 to 5), we have tried to develop similar scores in laboratory animals as follows: score 0 - normal aspect of the tibial-femoral joint; score 1 - 25% destruction; score 2 - 50% destruction; score 3 - stiffen marrow.

**Bone densitometry examination**

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![Young rat witness](Image)

![Adult rat with arthritis (may investigation)](Image)
Adult rat with arthritis (July investigation)

Young rat with arthritis (May investigation)

Young rat with arthritis (July investigation)
Inflammatory parameters in young animals

Average values of fibrinogen in young rats group with arthritis comparing to witness group

Ceruloplasmin levels variation in young rats group with arthritis

The average values of ceruloplasmin in young rats group with arthritis comparing to witness group
The variation of uric acid levels in young rats group with arthritis

Average values of uric acid in young rats group comparing to witness group

Inflammatory parameters in adult animals

The variation of fibrinogen levels in adults rats group with arthritis
Average values of fibrinogen in adults tars group comparing to witness group

The variation of ceruoplasmin levels in adults rats group with arthritis

The average ceruoplasmin values in adults rats group with arthritis comparing to witness group
Conclusions. Intensity of bones and cartilage destruction phenomena was higher in the young animals compared to adult ones, thus confirming the data presented in the literature.

Bibliography