Study of the differences between the Hyal-Joint® and hyaluronic acid ex fermentation on synovial fluid

OBJECTIVE
To determine the differences between Hyal-Joint® and hyaluronic acid (HA) produced by bacterial fermentation in the stimulation of the synthesis of endogenous hyaluronic acid (eHA) by human synoviocytes.
ABSTRACT

Hyaluronic acid is the main glycosaminoglycan in synovial fluid, where it is synthesized by the synoviocytes. HA provides viscosity to the synovial fluid, thereby improving joint function and reducing friction between articular-cartilage surfaces. In patients with osteoarthritis (OA), concentrations of endogenous HA in the synovial fluid are low, and the fluid’s viscoelastic properties are limited.

Intraarticular administration of exogenous HA is an alternative treatment currently used in cases of OA. The reason intraarticular HA is so effective is not yet fully understood, but the stimulation of endogenous HA synthesis has been shown to be one of its most important effects. A molecule that stimulates synoviocyte production of HA would therefore be a valid alternative for improving synovial-fluid health, and would be of particular interest if administered orally.

RESULTS

A culture of human osteoarthritic synoviocytes was stimulated using Hyal-Joint® (and HA from bacterial fermentation at different concentrations. After incubating the samples for 12 and 24 hours, the concentration of eHA in the cell cultures was measured. Both molecules have a dose-dependent effect, with the most efficacious dosages being 100 and 200 μg/ml.

![Diagram of cell culture of synoviocytes]

After 12 and 24 hours’ incubation, Hyal-Joint® presented higher values of eHA than HAf.

CONCLUSION

Based on the results obtained, it can be stated that, at the same concentration levels of each product, the highest levels of endogenous HA were measured in the cells stimulated with Hyal-Joint® and the lowest levels of endogenous HA were measured in the cells stimulated with HA from bacterial fermentation.

According to this study, it can be concluded that there are differences between the action of Hyal-Joint® and HA from bacterial fermentation in the synovial-fluid cells, with Hyal-Joint® being more active in promoting synthesis of endogenous HA.

CENTRE WHERE THE STUDY WAS PERFORMED

The study was carried out by a group of investigators under the direction of Dr. Blanco at the Rheumatology Service Research Unit at Hospital Juan Canalejo in La Coruña.

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