

Effect of Hyaluronic Acid on Chondrocyte Apoptosis

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Summary:

Prevention of apoptosis is important for the prevention of post-traumatic OA. HA reduces the rate of apoptosis.

Abstract:

BACKGROUND

Chondrocyte apoptosis follows trauma and triggers osteoarthritis(OA). The prevention of apoptosis prevents OA. Hyaluronic acid (HA) suppresses chondrocytes apoptosis in instability and chemical models of OA.

PURPOSE

The aim of this study was to quantify the percentage of apoptotic cells in a contusion model of OA and assess whether intra-articular injection of high doses of HA immediately after trauma, can reduce chondrocytes' apoptosis.

METHODS

Forty knees of adult rabbits were impacted twice with a 1kg block released through a cylinder, 1 meter tall (29.4 Joules). Subsequently, 2ml of HA were injected in one knee and 2ml saline in the contra-lateral knee. Medications were repeated twice a week during 30 days, after which the animals were sacrificed. Specimens were prepared for optical microscopy and terminal deoxynucleotidyl transferase end labeling (TUNEL) staining.

RESULTS

The apoptosis rate of the contusion model was 68.01% (+ 19.73), a higher rate than those described. HA reduced significantly the rate of apoptosis to 53.52% (+ 18.09) ($p < 0.001$).

CONCLUSION

Intra-articular HA starting immediately after trauma, reduces impact-induced chondrocytes' apoptosis rates in rabbits.

CLINICAL RELEVANCE

Prevention of apoptosis is important for the prevention of post-traumatic OA. HA reduces the rate of apoptosis.

KEYWORDS: Chondrocyte; Hyaluronic Acid; Apoptosis; Rabbit; Traumatism; Knee / histology