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Longterm effects of intraarticular hyaluronan on synovial fluid in osteoarthritis of the knee.

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OBJECTIVE: Intraarticular (IA) hylan injections constitute second-line therapy for osteoarthritis (OA) of the knee, but human studies suggesting a possible mechanism of action are lacking. We examined the effect of IA Hylan GF-20 injections on synovial fluid (SF) hyaluronan (HA) concentration, viscosity, and elasticity over a 6-month period in patients with mild to moderate OA of the knees.

METHODS: Patients with symptomatic knee OA (Osteoarthritis Research Society International grade 1-2) had SF aspirated from the study knee pre- and 3 and 6 months post-Hylan injection. Primary endpoints included SF HA concentration, viscosity, and elasticity. SF HA concentration was determined using uronic acid assay, and rheology measured using a micro-Fourier rheometer.

RESULTS: Sequential SF samples were available from 32 of 60 subjects injected at baseline (15 men, 17 women; mean age 65 yrs) at 3 months post-injection. The mean HA concentration had increased by 13% ($p<0.0008$), and the complex shear modulus had increased by 16% ($p<0.03$). Sufficient SF was also available from 19 of these subjects at 6 months post-injection when mean HA concentration was 2.24+/-0.62 mg/ml compared to their baseline mean of 2.02+/-0.52 mg/ml, an increase of 10% ($p<0.053$).

CONCLUSION: This open-label study showed a statistically significant change from baseline in both SF HA concentration and complex shear modulus at 3 months following IA Hylan GF-20 injection among subjects with mild to moderate knee OA. These results suggest that one possible mechanism of action of viscosupplementation is to promote endogenous HA production. Longer-term studies are required to identify whether these changes in SF measures are important for modification of disease progression in knee OA.

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