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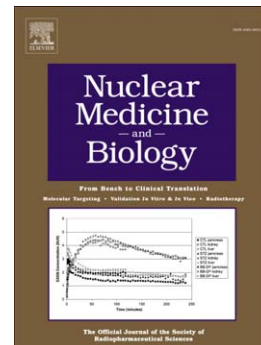
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Preclinical evaluation of ^{99m}Tc labeled chondroitin sulfate for monitoring of cartilage degeneration in osteoarthritis.

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ABSTRACT

Purpose: In previous in-vitro and ex-vivo studies we proved the specific uptake of ^{99m}Tc radiolabeled chondroitin sulfate (CS) in human articular cartilage. As a logical next step for the clinical use for imaging osteoarthritis we investigated in-vivo uptake of $^{99m}\text{TcCS}$ in dogs.

Procedures: The radiolabeling of CS Condrosulf (IBSA, Lugano, Switzerland) was performed using 25 mg of CS and 20-40 MBq/kg body weight of ^{99m}Tc by means of the tin method. In-vivo uptake of $^{99m}\text{TcCS}$ was evaluated in dogs (n=12, castrated males, 4-9 years, with 15-51 kg body weight). 6 healthy dogs served as controls and 6 with clinical and radiological signs of osteoarthritis in the carpal, elbow, and tarsal joint were examined. The tracer was i.v. injected into the external cephalic vein. The uptake was monitored after 2, 4, 6 and 24h in healthy and osteoarthritic dogs using a planar gamma camera by regional planar or whole body ventral and dorsal acquisition. For whole body scintigraphy animals were under general anaesthesia, for planar under sedation only.

Results: In healthy control dogs we did not detect any specific uptake of $^{99m}\text{TcCS}$ in the cartilage. In contrast, in the diseased dog suffering from osteoarthritis a significant, specific, persistent uptake between 4-6h in tarsal, carpal and cubital joints was documented.

Median target (joint) to background (mid antebrachium) ratio (T/B) in the OA joints after 4, 6, and 24h was significantly higher than in healthy controls. Target to background ratio using soft tissue as a background (T/S) a similar significantly higher than in healthy controls

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