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Abstract #4892

Macromolecular fraction and magnetization exchange rate acquired with UTE-MRI differ in the tibial bone of diabetic rats: a feasibility study

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Synopsis

Keywords: High-Field MRI, Bone, Diabetes bone, UTE-MRI, MMF, Exchange rate

Motivation: Increased risk of fractures in patients with type-2 diabetes mellitus (T2DM) despite higher average bone mineral density is unexplained with routine diagnostic tools like DEXA and CT.

Goal(s): This study aimed to examine the feasibility of using ultrashort echo time (UTE) magnetization transfer (MT) modeling to detect the potential differences between T2DM and normal rats.

Approach: The macromolecular fraction (MMF) and proton exchange rate (k_{ab}) from UTE-MT modeling on the tibial bone of Zucker diabetic fatty (ZDF) and Zucker lean (ZL) rats were compared.

Results: There was a significant difference in MMF and k_{ab} measures between the two groups.

Impact: The MMF and k_{ab} measures can detect potential bone alternations related to T2DM which may help to better understand the pathogenesis of T2DM bone fractures.

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