GLUCOSE METABOLISM IN RHEUMATOID ARTHRITIS KNEE JOINTS BEFORE AND AFTER ANTI-TNF-ALPHA BLOCKADE: EVALUATION BY PET WITH 18-FDG

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Introduction. Tumor necrosis factor–alpha (TNF-α) is a proinflammatory cytokine, that plays a important role in the pathogenesis of rheumatoid arthritis (RA). It may enhance carbohydrate metabolism at the point of glucose entry into macrophages. Anti-TNF-α monoclonal antibodies are a new drug that is being investigated for its powerful anti-inflammatory effects.

Objective. To evaluate 2-[fluorine-18]fluoro-2-deoxy-d-glucose positron emission tomography (FDG-PET) for recognizing inflamed synovia and for assessing their response to anti-TNFα treatment.

Methods. Eleven patients (5 males; 6 females; age 52±16 years) who fulfilled ARA criteria for RA underwent FDG-PET scanning prior to TNF-alpha-blockade and 2 months later on average (range: 1-4 months). Data were assessed visually (diffuse uptake in soft tissue surrounding bones assumed to represent synovitis) and quantitatively (synovial maximum standard uptake value (SUV) normalized for lean body weight).

Results. Baseline scans revealed a synovitis pattern in 9/22 knees. The SUV was 2.03 ±0.97 (mean±SD) in diseased knees and 0.52±0.19 in normal synovia. During anti-TNF alpha-treatment, the metabolic synovitis pattern was still identified in 6/9 cases, but the intensity of uptake was significantly decreased [SUV 1.11±0.32 (mean±SD)]. In 3/9 cases, this pattern disappeared but SUV remained slightly elevated in one case [SUV 0.85±0.28 (mean±SD)]. No new synovitis developed in the initially normal knees [SUV 0.44±0.18 (mean±SD)].

Conclusions. Anti-TNFα therapy is associated with a decrease in glucose uptake of inflamed knee joints. FDG-PET is a promising noninvasive, objective, rapid and semi-quantitative imaging modality for assessing disease activity.

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