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**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- $\alpha$ ) 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- $\alpha$  monoclonal antibodies are a new drug that is being investigated for its powerful anti-inflammatory effects.

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

*Methods.* Eleven patients (5 males; 6 females; age 52 $\pm$  16 years) who fullfilled 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  $\pm$  0.97 (mean $\pm$ SD) in diseased knees and 0.52 $\pm$ 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 $\pm$ 0.32 (mean $\pm$ SD)]. In 3/9 cases, this pattern disappeared but SUV remained slightly elevated in one case [SUV 0.85 $\pm$ 0.28 (mean $\pm$ SD)]. No new synovitis developed in the initially normal knees [SUV 0.44 $\pm$ 0.18 (mean $\pm$ SD)].

*Conclusions.* Anti-TNF $\alpha$  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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