

Evaluation of four radiopharmaceuticals for imaging inflammation in a rabbit model of arthritis

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We compared the utility of four radiopharmaceuticals; ^{111}In -chloride, ^{67}Ga -citrate, ^{111}In labeled leukocytes (WBCs) and $^{99\text{m}}\text{Tc}$ -MDP for assessing the inflammatory response in antigen induced arthritis in a rabbit model. A total of 20 rabbits, divided into four equal groups, were included in this study. Each group was studied twice with a single radiotracer: a baseline study and a follow-up study after induction of the arthritis. Knee to knee, knee to whole body, and knee to liver (except for the group studied with $^{99\text{m}}\text{Tc}$ -MDP) ratios were generated. Knee to knee ratios showed no significant change from baseline to arthritis studies in any of the four groups.

Significantly increased knee to total body ratios were seen in all of the groups, except for the group studied with $^{99\text{m}}\text{Tc}$ -MDP. The greatest increase was seen in the group studied with ^{111}In -chloride. Significantly increased knee to liver ratios were observed in all three groups for which these ratios were generated and again the greatest increase was observed in the group studied with ^{111}In -chloride. In summary, based on the higher uptake observed in this group, of the four radiotracers evaluated, ^{111}In -chloride is probably the most useful for monitoring the inflammatory response in antigen induced arthritis. The symmetry of the response suggests that it may also be useful in monitoring the response to therapy.

Key words: imaging joint inflammation, antigen induced arthritis in rabbits, ^{111}In -chloride, ^{67}Ga -citrate, ^{111}In -WBCs, $^{99\text{m}}\text{Tc}$ -MDP