RESEARCH ARTICLE

Preclinical Validation of ^{99m}Tc–Annexin A5-128 in Experimental Autoimmune Myocarditis and Infective Endocarditis: Comparison with ^{99m}Tc–HYNIC–Annexin A5

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Abstract

Hydrazinonicotinamide–annexin A5 (HYNIC-Anx), a 99m technetium (^{99m}Tc)-labeled agent targeting phosphatidylserine, proved to be sensitive for the detection of apoptosis and thrombosis but is no longer available for clinical use. A mutant of human annexin designed for direct ^{99m}Tc labeling (referred to as Anx A5-128) showed improved binding affinity to phosphatidylserine and is expected to be used in humans. We compared both radiotracers with regard to pharmacokinetics and diagnostic ability in animal models. Biodistribution studies were performed in normal rats. Radiolabeled Anx A5-128 and HYNIC-Anx were compared in cardiovascular settings involving phosphatidylserine expression: experimental autoimmune myocarditis and infective endocarditis. Initial blood clearance was faster for Anx A5-128 than for HYNIC-Anx, and tissue biodistribution was similar overall for both tracers. The diagnostic sensitivity of Anx A5-128 was excellent and comparable to that of HYNIC-Anx. Anx A5-128 showed biodistribution and diagnostic ability similar to those of the HYNIC-Anx derivative, supporting its translation to clinical use.