

عنوان مقاله:

Preparation and biological study of ^{68}Ga -DOTA-alendronate

محل انتشار:

مجله پزشکی هسته ای و زیست شناسی آسیا اقیانوسیه, دوره 4, شماره 2 (سال: 1395)

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خلاصه مقاله:

Objective(s): In line with previous research on the development of conjugated bisphosphonate ligands as new bone-avid agents, in this study, DOTA conjugated alendronate (DOTA-ALN) was synthesized and evaluated after labeling with gallium-68 (^{68}Ga). Methods: DOTA-ALN was synthesized and characterized, followed by ^{68}Ga -DOTA-ALN preparation, using DOTA-ALN and $^{68}\text{GaCl}_3$ (pH: 4-5) at 92-95°C for 10 min. Stability tests, hydroxyapatite assay, partition coefficient calculation, biodistribution studies, and imaging were performed on the developed agent in normal rats. Results: The complex was prepared with high radiochemical purity (> 99% as depicted by radio thin-layer chromatography; specific activity: 310-320GBq/mmol) after solid phase purification and was stabilized for up to 90 min with a logP value of -2.91. Maximum ligand binding (65%) was observed in the presence of 50 mg of hydroxyapatite; a major portion of the activity was excreted through the kidneys. With the exception of excretory organs, gastrointestinal tract organs, including the liver, intestine, and colon, showed significant uptake; however, the bone uptake was low (<1%) at 30 min after the injection. The data were also confirmed by sequential imaging at 30-90 min following the intravenous injection. Conclusion: The high solubility and anionic properties of the complex led to major renal excretion and low hydroxyapatite uptake; therefore, the complex failed to demonstrate bone imaging behaviors.

کلمات کلیدی:

Ga-68, DOTA, Alendronate, Biodistribution, Radiolabeling

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