

PREPARATION OF RADIOPHARMACEUTICAL FOR HEPATOBILIARY IMAGING

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Most hepatobiliary agents labeled with ^{99m}Tc are iminodiacetic acid (IDA) derivatives. Among them, ^{99m}Tc -3-bromo-2,4,6-trimethyl HIDA best combines the characteristics of a high hepatic uptake, a low urinary excretion, and fast blood clearance, and it is a hepatocellular transit. Furthermore, ^{99m}Tc -3-bromo-2,4,6-trimethyl HIDA has a lower renal clearance and the highest degree of resistance to the competitive effects of bilirubin. Although ^{99m}Tc -3-bromo-2,4,6-trimethyl HIDA shows excellent characteristics for use in cholescintigraphy, all of the kits used in Uzbekistan are imported from abroad. A synthetic procedure of the 3-bromo-(2,4,6-

trimethylphenylcarbamoymethyl) iminodiacetic acid (3-bromo-2,4,6-trimethyl HIDA) as compound to prepare ^{99m}Tc -3-bromo-2,4,6-trimethyl HIDA has not been previously reported in the literature.

2,4,6-Trimethylaniline and all other chemicals used in this study were purchased from the Aldrich Chemical Co. (Milwaukee, USA), and were of AR grade. Sodium pertechnetate ($\text{Na}^{99m}\text{TcO}_4$) was obtained using a ^{99}Mo - ^{99m}Tc generator (Radiopreparat Enterprise, Uzbekistan). The radiolabeling yield was determined by means of an instant thin layer chromatography (ITLC).

3-bromo-2,4,6-trimethyl HIDA was synthesized, and lyophilized vials were prepared which contained 20 mg of 3-bromo-2,4,6-trimethyl HIDA and 0.4 mg of SnCl_2 . Radiochemical and biologic studies showed that this agent was obtained in high radiochemical purity, were stable in vitro and in vivo. The compound, ^{99m}Tc -3-bromo-2,4,6-trimethyl HIDA, possessed high hepatic specificity meaning that none of the tissues except for the hepatobiliary system showed radioactivity concentrations, and rapid hepatocellular transit and a rapid clearance from the organs was observed.

In conclusion, a lyophilized kit and its prepared ^{99m}Tc -3-bromo-2,4,6-trimethyl HIDA can be applied as a hepatobiliary imaging agent for the evaluation of the functional status of the hepatocytes and the patency of the biliary duct.