Intrahepatic Arterial Injection of Holmium166-Chitosan Complex in the Hepatoma Treatment: A New Therapeutic Modality

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About 80% of hepatoma patients are diagnosed as an advanced inoperable stage. At present the patients are dependent only on hepatic artery embolization or intra-arterial chemotherapy. Holmium-166 is mainly a beta-ray emitter(Emax: 1.84MeV, $t_{1/2}$= 26.8hr) with 90% absorption in 2.3mm of tissue and maximum 8mm in depth. Holmium166-chitosan complex (Ho166-C) is less permeable. For small hepatoma(<3cm in diameter), we obtained 86% response rate by percutaneous Ho166-C injection. For a larger tumor(>3cm), multiple injections are needed, which resulted in decreased distribution homogeneity and responsiveness. We tried intrahepatic arterial Ho166-C injection in 45 nodular type hepatoma. Mean dose of Ho166-C was 103.25mCi. The pharmcokinetics after injection of 100, 150 and 200mCi Holmium166-C were: Cmax(nCi) 31.69, 63.91, 75.03; AUC(nCi) 122.27, 284.52, 219.62; Cl(L/min) 0.187, 0.527, 0.911, respectively, and Tmax were 0.25(hr) in all dose. Among them, 34 patients(75.5%) showed successful response. Five (13.3%) had no response and one(2.2%) were stable. Reversible bone marrow suppression was main complication, which was evident in non-responsive patients. These results suggest that intrahepatic arterial injection of Ho166-C could be a highly effective and safe treatment of advanced hepatoma. Further comparative randomized trials are needed.