

Experimental study of the antitumor effect of phosphorus-32 glass microspheres on the tumor loaded nude mice

Lu Liu, Pei-Lin Huang, Guan-Sheng Tong

Lu Liu, Guan-Sheng Tong, Institute of Medical Science, Nanjing Railway Medical College, Nanjing 210009, Jiangsu Province, China

Pei-Lin Huang, Department of Pathology, Nanjing Railway Medical College, Nanjing 210009, Jiangsu Province, China

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Correspondence to: Dr. Lu Liu, Institute of Medical Science, Nanjing Railway Medical College, Nanjing 210009, Jiangsu Province, China. luliuzhou@263.net
Telephone: +86-25-3318787-49083
Fax: +86-25-3426368

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Abstract

AIM: To evaluate the pharmacological effect of phosphorus-32 glass microspheres (32P-GMS) injected into the implanted human liver cancer cell mass in nude mice.

METHODS: Fifty two Balb/ctumor loaded nude mice were allocated into treatment group ($n = 38$) and control group ($n = 14$), in the former group different doses of 32P-GMS were injected into the tumor mass, while in the latter group 31P-GMS or no treatment were given instead of 32P-GMS. After dynamically observing the growth of tumor for day 3-28, the experimental animals were killed

in batches, the tumor and its nearby tissues were examined by light and electronic microscopy.

RESULTS: In comparing with the control group, the treatment group showed the tumor inhibiting rates of 59.7%-93.6% (Variance analysis of the mean weight of different doses and control group after square root correction, $F = 579.62$, $P < 0.01$). As the tumor mass attained the absorbed dose of 7320 Gy, the tumor cells were completely destroyed and at this maximal dose in one case, the epithelial tissue neighboring to this mass showed the signs of metaplasia. When the absorbed doses ranged from 1830 Gy to 3660 Gy, most of the tumor cells showed the evidences of injury or necrosis, and some well differentiated tumor cells appeared. As the absorbed dose being 366 Gy or less, some tumor cells remained in active proliferative stage with a lot of fibroblasts and lymphocytes presented in the neighboring interstitial tissues.

CONCLUSION: When the experimental model of implanted human liver cancer cells received 32P-GMS of 1830-3660 Gy, it produces excellent anticancer action without any injury to the normal neighboring tissues and the prominent anticancer effect is found within day 3 after intratumor injection.

Key words: Liver neoplasms/pathology; Phosphorus-32 glass; Microspheres; Radiology, interventional; Antineoplastic agents; Mice, nude; Neoplasm transplantation; Neoplasms, experimental

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