Antitumor effect of radiosensitive microcapsules under subcutaneous injection

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Abstract

Since 2004, we reported the use of liquid-core microcapsules for anticancer drug targeting. However, we did not test their increasing of antitumor effect and decreasing adverse effect. In this study we observed antitumor effect and adverse effect of subcutaneously injected microcapsules in combination with radiation, in meth-A-fibrosarcoma in VIVO in BALB/c mice.

The capsules were generated by spraying a mixture of 2.0% hyaluronic acid, 2.0% alginate, supplemented with 0.2 mmol carboplatin on mixture of 0.5 mol/L $CaCl_2$ and $FeCl_2$. Resulting microcapsules were irradiated by ^{60}Co γ-ray at doses ranging from 0.5 to 2.5 Gy. The released carboplatin was detected and quantified by particle-induced X-ray emission.

The antitumor effect was measured by growth delay. The strength of adverse effect was measured basing on fuzzy hair, loss of body weight and death.

There were no significant difference in the concentration of carboplatin between encapsulated carboplatin and uncapsulated one in combination with radiation.

There were no significant differences in antitumor effect between combined therapy of encapsulated carboplatin with radiation and uncapulated carboplatin with radiation. However, their adverse effect was drastically decreased by encapsulating carboplatin.

Our microcapsules were considered effective in decreasing the adverse effect of carboplatin.