Effects of CXCR4 siRNA/dextran-spermine nanoparticles on CXCR4 expression and serum LDH levels in a mouse model of colorectal cancer metastasis to the liver.

ABSTRACT

Liver metastasis is the main cause of mortality related to colorectal cancer. CXCR4 is necessary for the outgrowth of colon cancer micrometastases. In oncology, it has been demonstrated that several human tumors release lactate dehydrogenase (LDH) into the circulation. CXCR4 gene expression and serum LDH levels are often increased in patients with colorectal cancer. Despite technological advances in cancer therapy, five-year overall survival is still around 50%. Therefore, better treatment needs to be developed. RNA interference (RNAi) is a modern and powerful tool for inhibition of gene expression. However, the rate-limiting step in this technology is effective delivery of RNAi agents. We have investigated a novel strategy of CXCR4 siRNA therapy and its effect on serum LDH levels in a BALB/C mouse model of colorectal cancer metastasis to the liver. Hepatic metastasis was established by injecting a CT26.WT mouse colon carcinoma cell line via the tail vein. Our results demonstrated that CXCR4 siRNA/ dextran-spermine nanoparticles achieved high silencing efficiency with low toxicity. Favorable localization of the nanoparticles was confirmed with CXCR4 gene expression in the liver, that was correlated with serum LDH levels. More research will be needed to determine the effect of CXCR4 silencing on serum LDH levels, which may be a useful marker for predicting liver metastasis in colorectal cancer.

Keyword: Colorectal cancer; CXCR4 siRNA; Serum LDH; Liver; Dextran-spermine.