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PROSTATE CANCER

Localized docetaxel delivery is feasible

Patients with metastatic castration-resistant prostate cancer (mCRPC) often receive treatment with systemically administered docetaxel; however, adverse events are common, and are known to have a detrimental effect on the quality of life of these patients. Now, research involving a mouse model of prostate cancer demonstrates the feasibility of targeted delivery of docetaxel using magnetically actuated drug delivery (MADD) from an implanted drug reservoir device.

A total of five mice underwent device implantation at the time of inoculation with tumour cells and tumour growth was monitored in all mice until approximately 2 weeks after inoculation. A 1.5-μg dose of docetaxel was then released using repeat 10-second magnetic pulses delivered over a 30-minute period using an external electromagnet positioned close to the device; drug delivery was repeated on a weekly basis for 6 weeks. Mice in other treatment groups received weekly doses of 10 mg/kg docetaxel, delivered either subcutaneously or intravenously over the same period of time.

Compared with untreated controls, mice receiving docetaxel via MADD had a significantly lower mean tumour growth rate. Furthermore, the growth rates of tumours in mice treated with subcutaneous or intravenous docetaxel were not significantly different to those of mice receiving docetaxel via MADD, suggesting that levels of antitumour efficacy were similar across all routes of administration. Histological examinations of tumour tissue samples revealed the highest levels of caspase-3 expression, and lowest levels of Ki67 expression (indicating engagement of apaoptosis and cellular proliferation, respectively) among tumour tissue samples from mice in the MADD group compared with all other groups, although these differences were not statistically significant.

These findings suggest that MADD provides a more effective, and possibly better tolerated, alternative to systemic administration of docetaxel.

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ORIGINAL ARTICLE Struss, W. J. *et al.* Magnetically-actuated drug delivery device (MADDD) for minimally invasive treatment of prostate cancer: An *in vivo* animal pilot study. *Prostate* http://dx.doi.org/10.1002/pros.23395 (2017)