Pharmacokinetic and Safety Evaluation of Carboplatin-Impregnated Calcium Sulfate Hemihydrate Beads after Implantation in Healthy Cats

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Introduction: Feline injection site-associated sarcoma (FISAS) is highly invasive and recurs in many cats despite curative-intent surgery. Studies have suggested that implantation of carboplatin-impregnated calcium sulfate hemihydrate (C-I CSH) beads may be an adjunctive treatment option. However, the pharmacokinetic and safety profiles of CI-CSH beads were not known in cats.

Materials and Methods: Six healthy research cats were studied. Three C-I CSH beads were implanted into individual muscle pockets in specific patterns over each hemithorax. Clinical laboratory testing was regularly performed, and plasma was analyzed for platinum content at specific times from 1 hour to 21 days. Subcutaneous tissue samples were obtained for histopathology and analysis of platinum at 3, 7, 14, and 21 days at specific distances from the sites of bead implantation.

Results: At all time points and distances, tissue concentrations of platinum were sustained over 21 days but below levels reported to be cytotoxic for FISAS cells in vitro. Plasma concentrations of platinum increased to 3 hours and then decreased sharply, and mild elevations in serum calcium and phosphorus occurred. Platinum concentrations in samples with muscle were significantly higher than concentrations in samples containing only subcutaneous fat. Minimal tissue changes were noted on histopathology.

Conclusions: Implantation of C-I CSH beads was well tolerated by healthy cats. C-I CSH beads implanted into muscle pockets did not release platinum into the subcutis at levels cytotoxic to FISAS cells in vitro. Use of muscle pockets should be reevaluated for C-I CSH bead placement in animals with dermal or subcutaneous tumors.