Acute Tolerance to Propofol Sedation in a Child Coming for One Month of Radiation Therapy
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SUMMARY: We present a case of a 3 year old boy with a history of Central Nervous System Ependymoma who was scheduled for 25 radiation therapy treatments extending over a 5 week period. During this interval the patient’s propofol requirements increased ~300%.

CASE REPORT: A three year old boy with a history of ependymoma had undergone craniotomy and resection and was scheduled for a course of radiation therapy over a five week period. The patient had no other significant medical history. Meds included pantoprazole, ondansetron, and a multivitamin. The child weighed 15kg and had a functioning broviac in place. After the initial anesthetic during which time the patient was marked with tattoos and a mask was molded to keep the patient’s head immobile during the treatment sequences the patient was scheduled for 25 treatments on an out-patient basis. After evaluation in the Pediatric ASU the child was transported to the radiation therapy suite with his mother. An IV was sterilely connected to his broviac. The child was carried into the radiation therapy unit with his mother, routine monitors were applied and the child received a bolus of propofol as he was being positioned. A propofol infusion was started. The entire period was usually less than 15 minutes.

At the start of the treatment sessions the child was readily induced with 2-3 mg/kg propofol and was managed on an infusion of (100-150 microgram/kg/min propofol). By the conclusion of the treatment sequence the patient required 7-8 mg/kg bolus to allow positioning and was maintained on 350 microgram/kg/hr.

DISCUSSION: Drug tolerance occurs to a lot of the medications that we frequently use in anesthesia. Propofol has been shown to induce tolerance in lab animals when boluses and continuous infusions were studied1. There have been studies looking at the pediatric cancer population and radiation treatment. One study looked at induction doses and did not show a clinically significant difference in induction propofol dosing during the treatment course of 6 children for a total of 159 treatments. The age of the patients were about 2 years of age2.

Another study looked at 15 patients during radiation treatment. The authors stated that physiologic parameters (heart rate, blood pressure, oxygen saturation, respiratory rate) and requirements for additional propofol did not increase during the treatment period for their patients3.

It appears that in our patient, there is a tolerance developed to repeated daily administration of propofol and we feel that this should be studied further.

REFERENCES: