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Procedural sedation performed by pediatric critical care physicians for children undergoing daily radiation therapy is effective and safe

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Abstract

Radiation therapy targets tumor tissue and requires children to lay still, often necessitating sedation. Historically anesthesiologists provided procedural sedation, but pediatric critical care physicians now regularly administer sedation outside the operating room. Procedural sedation for radiation poses unique challenges. The objective was to evaluate the success and assess complications of repeated sedations for radiation performed by pediatric critical care physicians. We performed a single-center, retrospective case series of children who received procedural sedation for radiation therapy by PICU physicians. The primary outcome was success, defined as completion of radiation treatment. Secondary outcomes included type of medication, dosing, tolerance, and complications requiring intervention. In our sample, 55 patients underwent 1174 sedation instances (mean 19.8 per patient). Patients had a mean age of 4.7 years (SD3.4), and weight of 20.2 kg (SD11.9). All patients had an ASA of 2 or 3. All patients had either a brain tumor or a non-mediastinal solid tumor. The success rate was 99.8%. The mean duration of sedation was 30.7 min (SD12.4). All sedations included propofol as a first agent with a mean bolus 3.3 mg/kg (SD1.4) and drip rate 148.7 mcg/kg/min (SD39.7). 4.4% of sedations required a second agent medication. There was no significant effect of repeated sedation with regards to the medication amount received ($p = 0.97$). Laryngospasm occurred during 0.2% of sedations. No patients required bag-mask ventilation, intubation, or chest compressions; no patients died during sedation. Pediatric critical care physicians can perform procedural sedation for radiation therapy successfully.

Keywords: Critical care; PICU; pediatric; radiation; sedation; tumor.

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