Implementation of a Practice MRI Program Shows Rapid Improvement in Success of MRI Without Sedation in Pediatric Patients Following Introduction of Simulation Training

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INTRODUCTION

• Magnetic resonance imaging (MRI) is a common modality for pediatric diagnostic imaging often requiring sedation or general anesthesia.
• Practice MRI has been shown to be effective in decreasing the need for sedation or anesthesia in pediatric patients.
• This study examines our experience with the implementation of a practice MRI program looking specifically for patient, MRI study or staff characteristics associated with the success of MRI completion without the use of sedation or general anesthesia.

METHODS

• Retrospective review of 112 subjects, 3-16 years of age (mean 7.85 years) designated as anesthesia cases for MRI during a nine-month trial.
• Patient selection for simulation trial was at the discretion of the Child Life Specialist (CLS) (age, parent request, scan type/duration and demeanor during evaluation).
• No formal criteria was used to advance from simulator to live MRI (child’s ability to remain motionless during the simulation (≥ 5 minutes) and follow directions).
• Success of live MRI was defined as completion of the examination without using sedation or general anesthesia while acquiring acceptable diagnostic images.
• Multivariable logistic regression was used to predict success of MRI without sedation adjusting for months since introduction of the simulator, patient age and gender, type of scan, and supplemental use of video goggles.
• Fixed-effects logistic regression was used to account for clustering of patients by CLS.

RESULTS

• 94 of 112 (84%) subjects completed live MRI without general anesthesia or sedation.
• Monthly success rates ranged from 60% in the first month to 100% in the second, seventh, and ninth months.
• Multivariable logistic regression adjusting for all covariates found that each month since simulator introduction was associated with 42% greater odds of success (OR=1.42; 95% CI: 1.08, 1.85; p=0.011).
• No covariates in the multivariable model, including use of video goggles, were significantly associated with successfully completing MRI without sedation.

CONCLUSIONS

• Implementation of an MRI practice program is valuable in avoiding the need for general anesthesia or sedation.
• Despite the lack of clear guidelines for selecting pediatric patients for MRI simulation training and advancement to a live MRI without sedation or anesthesia, success rates improved rapidly after simulator introduction and experience.
• The use of such a program not only offers a potential safety advantage, but also significant cost and scheduling efficiency.

REFERENCES