

Feasibility of Pediatric Procedural Sedation in a Limited-Resource Setting: Successes and Challenges

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Background

Pediatric procedural sedation is common in Emergency Departments in high-income countries for children needing painful procedures like orthopedic reductions, burn debridement or suture repair. It is expected that pediatric emergency providers be able to provide procedural sedation. Due to limitations in medical education and resources, children in low- and middle-income countries (LMIC) frequently do not receive sedation when they must undergo painful procedures. There is also no formalized training or guideline for medical providers in LMIC on how to safely perform procedural sedation in children. This feasibility project aimed to teach medical providers in a limited-resource setting how to safely perform procedural sedation in children. There is a robust partnership between Children's Hospital of Boston and the Pediatric Post Graduate Residency Training program at Liberia College of Physicians and Surgeons (LCPS). This project was implemented with pediatric and surgical residents in Liberia given their role as emergency providers for children necessitating painful procedures who benefit from procedural sedation.

Objectives

- Develop and implement a curriculum for pediatric providers in LMIC on how to safely use ketamine for procedural sedation in children.
- Demonstrate objective knowledge gain.

Methods

With the input of content experts from the fields of Pediatric Anesthesiology and Pediatric Emergency Medicine, a curriculum was developed including: indications and contraindications for procedural sedation, pharmacology of ketamine, potential adverse events, appropriate documentation and post-sedation monitoring. The curriculum utilized adult learning theories and was tailored specifically for limited-resource settings, in that it focused on medications and equipment that are inexpensive and widely available in LMIC. Participation was offered to all residents enrolled in the Pediatric and Surgery Programs at LCPS and was completely voluntary. The training lasted a total of six hours over two days. Participants' knowledge of procedural sedation using pre- and post-assessments was evaluated.

Results

Sixteen residents participated in the training (9/16 [56%] pediatric residents and 7/16 [44%] surgical residents). Mean pre-test score was 53.6 (range 33.3 – 66.7, n=16). Mean post-test score was 89.6 (range 75 – 100, n=8). Among the residents who took both pre- and post-tests, all showed improvement.

Conclusion

This feasibility study showed substantial knowledge gain regarding procedural sedation among pediatric providers in LMIC. Further research is necessary to investigate change in practice patterns regarding procedural sedation, as well as frequency of adverse events that occur during procedural sedation. An international guideline for pediatric procedural sedation in resource-limited settings should be developed as a critical first step towards expanded procedural sedation practice.