

Effectiveness of Immersive Virtual Reality Technology as a Distraction Technique During Awake Pediatric Interventional Radiology Procedures

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Background/Introduction: Non-pharmacological distraction techniques have shown to improve patient cooperation during pain and anxiety provoking interventions (1,2). Immersive virtual reality (VR) technology is a novel distraction technique that can be utilized in our pediatric population to facilitate successful invasive procedures with minimal to no pharmacological sedation (3). We aimed to evaluate the effectiveness of using VR technology in lieu of pharmacologic sedation for select interventional radiology procedures.

Methods: This investigation was a collaborative effort between anesthesiology and interventional radiology departments at a pediatric tertiary referral center. Patient selection and informed consent for use of VR technology was performed. Prior to the procedure, the patient was oriented to the VR system: a Samsung Gear Virtual Reality Oculus headset, a handheld controller, and a pre-loaded library of age-appropriate games (Samsung Electronics, Suwon, South Korea). The patient was positioned in the appropriate procedural position in accord with effective and comfortable use of the VR system. During the procedure, the anesthesiologist remained at bedside, providing supplementary distraction coaching. A pre- and post-procedure survey examining pain levels and patient satisfaction scores were obtained from both the patient and the consenting legal guardian.

Results: An 11-year-old female gymnast with chronic back pain requiring epidural steroid injections was selected as the pilot subject. The patient preferred not to undergo an anesthetic due to a previous adverse reaction and elected to proceed with the procedure awake. She underwent two injections while using VR technology in September 2019 and October 2019. Both procedures were technically successful without procedural complications. After each procedure, the patient expressed a maximal satisfaction score of 10 out of 10 and reported VR as her choice if repeat procedures were necessary. Lower pain scores were also reported with VR immersion intraoperatively. The patient's mother also reported satisfaction with her daughter's experience and would request the same method of distraction for future injections.

Conclusion: With appropriate patient and procedural selection, immersive virtual reality technology is a safe, effective distraction technique that can be used to decrease pain, anxiety, and improve patient satisfaction during awake invasive interventions. By decreasing or removing the need for pharmacologic sedation for select procedures, unnecessary perioperative anesthetic risk can be reduced in our pediatric patients.

References:

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