Preliminary Results of Functional Response to Immersive Virtual Reality in Pediatric Patients with Ruptured Appendix

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Introduction: Virtual reality (VR) is effective in decreasing pain and anxiety in several clinical settings, but its use in the acute postoperative period is largely unexplored.

Hypothesis: We hypothesize that guided relaxation-based VR (VR-GR) provides greater reductions in postoperative pain and anxiety vs distraction-based VR (VR-D) in children undergoing appendectomy for ruptured appendix.

Methods: Patients 8-18 years presenting for laparoscopic appendectomy for ruptured appendix were randomly assigned to VR-GR or VR-D treatment. Patients with history of developmental delay or neurologic/psychiatric conditions were excluded. Pain catastrophizing (PCS-C) and anxiety sensitivity (CASI) were assessed prior to VR. Patients underwent 10-minute VR sessions daily for three consecutive days. Pain intensity, pain unpleasantness, and anxiety were recorded with the numeric rating scale (NRS) prior to VR use, and again immediately, 15-minutes, and 30-minutes after VR.

Results: Three patients have been recruited thus far (100% male; 66.7% Caucasian; age 11 ± 2 years). Patient 1 withdrew on POD1. Patient 2, assigned to VR-GR, experienced pain relief immediately after VR-use on POD1 (baseline 8.0, 5.0 at 0-minutes). Subsequent days showed more sustained reductions (POD2 baseline 6.5, 4.0 at 0-minutes, 5.0 at 15-minutes; POD3 baseline 6.0, 4.0 at 0-minutes, 5.0 at 15-minutes, 4.0 at 30-minutes). Change in pain unpleasantness was most pronounced POD1 (baseline 10.0, 6.0 at 0 and 15-minutes, 9.0 at 30-minutes), decreasing on subsequent days. Anxiety only decreased on POD1 (baseline 8.0, 3.0 at 0-minutes, 5.0 at 15-minutes) after which baseline anxiety remained at 0.0. Patient 3, assigned to VR-D, experienced some pain alleviation on POD1 (baseline 4.0 points; -1.0 points immediately and 30-minutes after), but no change in pain unpleasantness or anxiety (respective baseline 7.0 and 0.0). Discomfort was absent on POD 2 therefore no changes were seen with VR.

Conclusions: Drawing conclusions from preliminary findings is difficult with few patients. Current trends may point towards greater short-term reductions in pain and anxiety in VR-GR vs VR-D. Further enrollment is required.

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