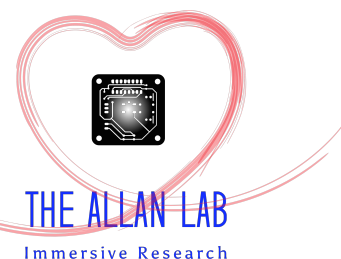


Virtual Reality – a new addition to the anxiolytic armamentarium during implantation of cardiac devices.

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INTRODUCTION

Pacemaker implantation can be a painful and anxiety-provoking procedure¹. Perioperative pain and anxiety impact patients' experiences and are associated with higher complication rates and prolonged recovery times.

Through distraction, virtual reality (VR) can improve the experience of patients undergoing these procedures, blunting pain perception². Further, as the experience of pain is strongly influenced by psychological and environmental factors, transporting the patient from the unfamiliar environment of the operating theatre to a relaxing and meditative scene can help alleviate both anxiety and pain³.

We conducted a pilot study to assess the effects of the use of intra-operative VR in patients undergoing pacemaker implantation.



Figure 1. Example VR Meditation Scene: Zen Garden Scene (Image: HealthyMind)

METHODS

Twenty patients undergoing elective or urgent pacemaker procedures were screened for eligibility. Two were excluded (lacking capacity, 1; visual impairment, 1), and one declined participation. The mean age was 81.5 years.

The control group (n=8) received standard care: local anaesthetic (lidocaine 1%) at the pacemaker implantation site and use of intravenous midazolam at the operator's discretion. The intervention group (n=9) received an immersive guided meditation in VR (HealthyMind) during the procedure, in addition to standard care.

The VR experience was controlled using a linked wireless tablet by the researcher, which also allowed direct communication with the patient. The patient was free to remove the headset at any time.

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DISCUSSION

This pilot study showed good acceptability of VR in this demographic of patients and lower pain scores for those receiving VR anxiolysis. This work is caveated by small sample size, heterogeneous study population and multiple confounding factors. Future studies could include alternative biometrics, such as galvanic skin response, as physiological markers of pain and anxiety.



Figure 3. Patient wearing HealthyMind VR headset during procedure. (Shared with patient's consent).

RESULTS

Pain & Anxiety:

- Lower reported **pain** (visual analogue scale; 1.9 vs. 3.1);
- Post-procedure **anxiety** was similar in both groups (State-Trait Anxiety Index; 80.4 vs 81.9);

Medication use:

- No significant difference in local anaesthetic use (28.3 vs 28.5 ml of 1% lidocaine);
- Fewer patients required the anxiolytic midazolam (11% vs 25%);

Comfort:

- Three patients in the VR group (33%) fell asleep during the procedure, compared with only one in the standard care group (13%).
- One patient removed the headset during the procedure due to discomfort related to the device strap

Physiological monitoring:

- The prerequisite dysrhythmias in patients undergoing pacemaker implantation precluded any meaningful interpretation of HR and HRV-derived stress scores (Figure 2).

There were no significant procedural complications.

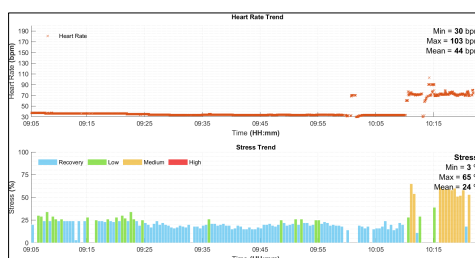


Figure 2. B-Secur HeartKey continuous heart rate and Physiological Stress score monitoring.

CONCLUSION

The use cases for VR in healthcare are expanding, from medical simulation for clinician education and complex procedure planning to virtual rehabilitation programmes⁴.

This pilot study sits alongside a growing body of evidence supporting the perioperative use of VR⁵ and demonstrates that VR is a feasible intervention to reduce pain and anxiety during the implantation of cardiac devices.

In addition to good tolerability and analgesic effect, the trend toward reduced medication requirements with VR suggests that patients will avoid harm from medication side effects and recover more promptly after their procedure. Given the excellent safety profile of VR, there seems little to lose.

ACKNOWLEDGEMENTS

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