CLINICAL STUDY

Clinical Efficacy, Safety, and Feasibility of Using Video Glasses during Interventional Radiologic Procedures: A Randomized Trial

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ABSTRACT

Purpose: To evaluate the clinical efficacy, safety, and feasibility of implementing video glasses in a variety of interventional radiologic (IR) procedures.

Materials and Methods: Between August 2012 and August 2013, 83 patients undergoing outpatient IR procedures were randomized to a control group (n = 44) or an experimental group outfitted with video glasses (n = 39). State-Trait Anxiety Inventory (STAI) scores, sedation and analgesia doses, mean arterial pressure (MAP), heart rate (HR), respiratory rate (RR), pain scores, and procedure times were obtained. Complications and adverse events related to the use of video glasses were recorded. Postprocedural staff surveys and patient satisfaction surveys were completed.

Results: Women had greater preprocedural anxiety than men ($P = .0056$), and patients undergoing vascular interventions had greater preprocedural anxiety than those undergoing nonvascular interventions ($P = .0396$). When assessed after the procedure, patients who wore video glasses had significantly reduced levels of anxiety (−7.7 vs −4.4, respectively; $P = .0335$) and average MAP (−6.3 vs 2.1, respectively; $P = .0486$) compared with control patients. There was no significant difference in amount of sedation and analgesia, HR, RR, pain score, or procedure time between groups. No significant adverse events related to the use of video glasses were observed. Postprocedural surveys showed that video glasses were not distracting and did not interfere or pose a safety issue during procedures. Patients enjoyed using the video glasses and would use them again for a future procedure.

Conclusions: Video glasses can be safely implemented during IR procedures to reduce anxiety and improve a patient's overall experience.

ABBREVIATIONS

HR = heart rate, IR = interventional radiologic, MAP = mean arterial pressure, RR = respiratory rate, STAI = State-Trait Anxiety Inventory

Minimally invasive procedures provide an alternative to open surgery and the advantage of reduced general anesthesia, pain, and recovery time. However, despite the technical advantages, patients often experience varying levels of anxiety about procedures and their outcomes.

Increased anxiety leads to physiologic stress on the body, which has potential detrimental health effects, such as impaired or prolonged healing (1). In patients undergoing surgery, anxiety is associated with increased anesthesia use (2) and postoperative pain medications, both of which can lead to potential complications such as cardiovascular and respiratory depression, aspiration, decreased activity, increased risk of thrombosis, and reduced bowel motility (2,3). Patients undergoing minimally invasive procedures are commonly treated with moderate sedation (4), which is associated with its own risks, including hypoxia, apnea, unconsciousness, and motor imbalances (5–8).

Previous studies have explored different strategies to decrease procedural anxiety, including music therapy, relaxation training, guided imagery, and self-hypnosis (9–11). However, we are aware of no research to date

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that has investigated the clinical efficacy, safety, and feasibility of using audiovisual devices in patients undergoing interventional radiologic (IR) procedures. Unlike previously studied interventions, video glasses can provide a hands-free and audiovisual experience for patients. The goal of the present research is to assess whether video glasses can be implemented safely in a variety of IR procedures without disturbing physicians and support staff and without interfering with the normal physician–patient interaction. We hypothesized that video glasses can be used to positively impact patients undergoing IR procedures by reducing anxiety, as well as improving the overall patient experience.

MATERIALS AND METHODS

Patient Selection

This prospective single-institution study was approved by the research study review board of the institution Between August 2012 and August 2013, we recruited adult patients who were undergoing elective IR procedures at the institution. Patients 18 years of age or older, of either sex and any ethnicity, were recruited provided they spoke English, were undergoing an outpatient IR procedure, and were able to provide informed consent. Patients were excluded if they were (*i*) undergoing emergency procedures; (*ii*) required general anesthesia; (*iii*) had a history of hearing difficulties, visual difficulties, or epileptic seizures; (*iv*) were unable or unwilling to understand or provide informed consent; or (*v*) were unable to complete study procedures or unable to tolerate study constraints.

Patients were randomized to an experimental group (video glasses) or control group (no video glasses) based on block randomization (block size of 4). The randomization process was concealed with the use of sealed and consecutively numbered envelopes. Patient enrollment, assignment, and data collection were performed by two research coordinators at the study institution.

The Consolidated Standards of Reporting Trials study flowchart is shown in Figure 1. Briefly, among 240 patients eligible for the study, 96 consented and were enrolled. Thirteen patients (eight in the video glasses group and five in the control group) were excluded from the study for the following reasons: (*i*) the patient decided to take off the video glasses during the procedure (n = 5), (*ii*) the study was interrupted during

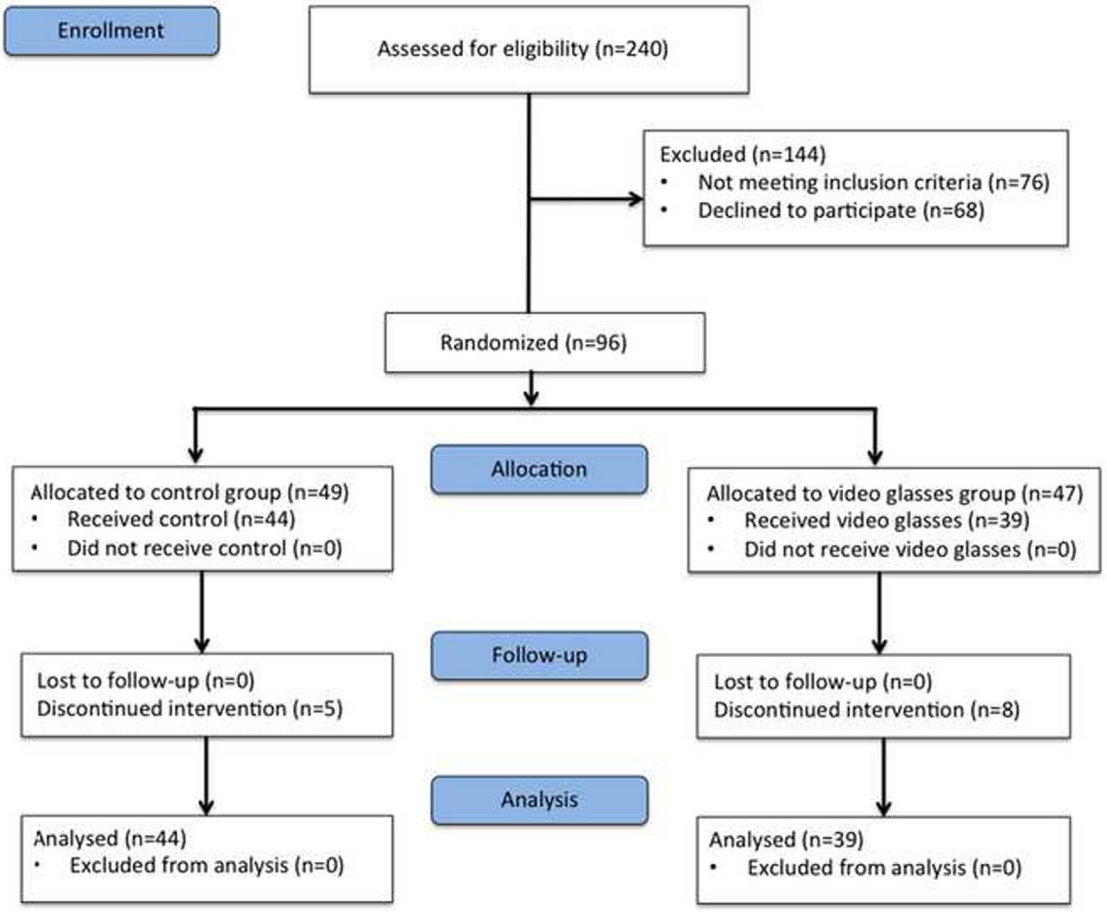

Figure 1. Consolidated Standards of Reporting Trials flowchart.