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Alleviating anxiety in patients prior to MRI: A pilot single-centre single-blinded randomised controlled trial to compare video demonstration or telephone conversation with a radiographer versus routine intervention

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ABSTRACT

Introduction: Patients undergoing MRI often experience anxiety prior and during scanning. The aim of this study was to explore two simple, cost-effective and easily implemented interventions to reduce anxiety pre MRI scanning.
Methods: Seventy four patients attending first time for a MRI head, spine or cardiac scan were randomised into one of three interventions: video demonstration; telephone conversation with a radiographer; or routine MRI preparation (appointment letter). The State-Trait Anxiety Inventory (STAI) questionnaire was used to measure anxiety levels both pre and post intervention. Motion artefacts were visually assessed by 2 observers and a post scan survey was used to capture patient's satisfaction.
Results: ANCOVA revealed a significant reduction of anxiety in the video group ($F = 13.664$, $p = 0.001$), and also in the telephone group ($F = 6.443$, $p = 0.015$) compared to control patients. No significant difference was found between the two interventions ($F = 0.665$, $p = 0.419$). No difference was seen in motion artefacts between all three groups (Chi2 = 2.363 ($p = 0.359$) for observer 1 and Chi2 = 1.280 ($p = 0.865$) for observer 2). Fifty one percent (51.4%) of patients admitted to being anxious, with the possible outcome of the MRI results being the most common (18.9%) reason given for anxiety.
Conclusion: This study has demonstrated that either of the interventions used can significantly reduce pre-MRI anxiety, with the video performing slightly better than the phone call intervention. Importantly, the routine appointment letter did not contain enough information to satisfy most patients, which argues strongly for a change in current practice.

Introduction

Patients undergoing magnetic resonance imaging (MRI) often experience fear and anxiety prior to and during scanning. This could result in early termination of scan and indirectly affect image quality in terms of motion artefacts. In addition anxiety is known to increase respiratory rate, peristalsis and fluid flow, all potentially having detrimental effects on image quality.[1,2] It is reported that up to 37% of patients undergoing an MRI scan experience moderate to high levels of anxiety.[2,3]

For this reason, there has been much research testing different interventions to reduce anxiety, early termination and motion artefact, and to improve patient experience. However, the majority of previously explored interventions have either been time consuming, difficult to implement into practice, or very costly. Psychological interventions such as cognitive behavioural therapy,[1,4,5] sedation[6,7] and mock MRI[8,9] are very protocol driven, and do not consider the individual needs of each patient. In addition, the majority of these trials have focused on paediatric patient as oppose to adult patients, however the psychological needs between

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these two cohorts of patients would differ significantly. Patients have been found to have diverse informational needs[10] which supports the importance of an intervention that is flexible and caters for all patients. Patients also tend to have limited knowledge regarding diagnostic procedures with the main source of information being family and friends.[10,11] In addition, over half of patients do not know the type of investigation they will receive when attending the radiology department.[11] This limited information about the procedure decreases a patients perceived level of control and increases their fear and uncertainty.[12]

Additional written information has been a common method explored to better inform patients and to reduce anxiety prior to MRI, but there are mixed views regarding this intervention.[2,13] Video demonstration on the other hand has been found in many studies to be an effective method to improve the level of patient satisfaction prior to various medical procedures and to help reduced anxiety.[14–16] A randomised controlled trial recently explored the use of a DVD prior to patients undergoing an MRI. This study demonstrated that the intervention effectively alleviated psychological distress related to the scan which lead to decreased motion artefacts and increased scan completion rate.[17] There are however a few limitations that need to be considered within the study: the use of closed questions for patient response, which did not allow patients to elaborate on their experience fully; and the inclusion of a range of mixed scanning protocols which all may affect anxiety differently.

The current project set out to evaluate the use of two different interventions that better inform patients prior to an MRI scan with the intention of eliminating any misconceptions they may have regarding the scanning procedure. The primary aim of this study is therefore to establish whether a video demonstration or a telephone conversation with a radiographer can reduce anxiety prior to the scan.

Method

Design

This study was a pilot single-centre single-blinded randomised controlled trial (RCT) to compare the use of video demonstration, or a telephone conversation with a radiographer, versus routine intervention, to alleviate anxiety in patients prior to undergoing MRI. Patients were randomised to either one of two interventions or a third control group: 1. Online video clip (in addition to standard appointment letter and information); 2. Telephone conversation with a radiographer (in addition to standard appointment and information); 3. Standard appointment letter with information. Patients were asked to complete a validated anxiety questionnaire prior to and after receiving the intervention and also were asked to complete a post scan survey regarding their entire experience. Motion artefacts for acquired images were also assessed.

Ethical approval was obtained from the Wales Research Ethics Committee 5 (REF 14/WA/1233).

Patients

Patients were first time attending outpatient adults awaiting an MRI scan of their head, lumbar spine or heart on a Philips Achieva 1.5T scanner. From reported literature[1,3] and local clinical experience, the examination with the highest incidence of patient anxiety and premature termination is head scan. Examinations of the spine also have a high incidence of anxiety and premature termination. Cardiac patients have not yet been explored in the literature, however it is one of the longest lasting MRI scans. Patients were excluded if they were inpatients, were not able to communicate in English or Welsh, deemed to lack capacity to consent or were under the age of eighteen. Patients were also excluded if they required contrast or intended to take benzodiazepines prior to the scan. These were deemed to be confounding factors that could influence the level of anxiety experienced by the patients. A sample size calculation was completed to ensure that the study would be adequately powered to detect a meaningful difference in levels of anxiety between groups. This included allowances for predicted sample attrition and non-response across the duration of the study. Our assumption was that anxiety levels between patients receiving an intervention as oppose to routine preparation would reduce by approximately 25%. From this estimation, a total sample size of 90 would have 80% power to detect this reduction in patient's anxiety level, allowing for 20% attrition. Two hundred and thirty patients were invited to participate with a patient information sheet, consent form and a pre intervention anxiety questionnaire sent in their appointment letter. These patients were then called to determine whether they wanted to participate and subsequently randomised into the trial.

Randomisation to the study was achieved by secure web access to a remote randomisation system from NWORTH CTU at Bangor University. The randomisation was performed by dynamic allocation to protect against subversion while ensuring that the trial maintained good balance to the allocation ratio of 1:1:1 both within the stratification variable and across the trial.[18,19] Patients were stratified by areas scanned and gender.

Interventions

Control group

The control group received the standard information letter sent to all MRI patients prior to an appointment. This contains the appointment letter, the safety questionnaire and an A4 bilingual single sided sheet with information regarding basic technical details, safety issues and in general what to expect from the scan (see Appendix 1).

Intervention group 1

Intervention one consisted of a short video clip made specifically for this study using actors to illustrate the most important events occurring during the MRI procedure. The video visually demonstrates what the MRI machine looks like, how it works, examples of the noise generated and what is required of them during the scan. It is approximately a 4 min clip commencing with arrival at reception all the way through to departing the department and obtaining results. A link was available on the patient information sheet of all eligible patients however only those randomised into the video group were provided with a password. If patients did not have internet access, they had the opportunity to watch the video clip in the waiting room prior to their scan. The content of the video clip was chosen after discussion with MRI staff and previous patients to ensure all important and useful information was covered.

Intervention group 2

The second intervention was a telephone conversation prior to the MRI scan. This was an informal but semi-structured information session over the telephone where the radiographer provided patients with relevant information, answered questions and reassured them about any worries they may have prior to the procedure. Once randomised to this group, the patient and researcher arranged a suitable date and time for the telephone conversation to happen ensuring that the pre intervention anxiety questionnaire had already been completed prior to that time. The essential aspects of the telephone conversation were to develop a trusting relationship with the patient whilst encouraging them to express

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