

Specially selected music in the Cardiac Laboratory -an important tool for improvement of the well-being of patients

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Abstract

Purpose: To investigate the effect of a specially selected music sound environment on the wellbeing of adult, lightly sedated patients in a Cardiac Laboratory during invasive procedures.

Method: 193 patients were included in two groups. One group (99 patients) was exposed to specially selected "music sound environment" (music group) – the other group (94 patients) was exposed to "basic sound environment" (non music group). The patients were questioned about their well-being and opinion of the sound environment during the procedure.

Results: In the music group 90 patients (91%) found that the sound environment was pleasant – compared to 53 patients (56%) in the non music group ($p < 0.05$). The group of patients with "no opinion" was significantly lower ($p < 0.05$) in the music group than in the non music group (8% versus 42%). In the non music group 34% of the patients were positive to a hypothetical offer of listening to music, whereas 82% of the patients in the music group liked the music. Both groups noticed sounds and noises with similar frequencies. In the music group 62% of the patients noticed the music spontaneously. Sixty eight patients (68%) experienced, that music was of major positive importance for their feeling of well-being. Seven patients (7%) expressed that the music was of minor positive importance. None experienced a negative correlation between music and well-being. The results were not related to age, sex or procedure. The patients expressed that music made them feel less tense, more relaxed and safe.

Conclusion: Specially selected music had a positive effect on the well-being of patients and experience of the sound environment during invasive cardiac interventions. Based on the negative expectations and the positive experience of the patients with regard to music environment, we recommend that specially selected music should be a part of the sound environment in the cardiac laboratory, without asking the patients for permission on beforehand.

Method

Setting

Our Cardiac Laboratory is equipped with two almost identical x-ray rooms for coronary interventions. In x-ray room 1 the sound environment consisted of our usual "basic sounds", which were the sounds and noises from the staff (3 nurses and 1 cardiologist), the heartbeat of the patient through loudspeakers (to be heard by everyone in the room and to be used clinically by the staff), unpacking of sterile equipment, telephones, talking, ventilation, the noise from the movable x-ray equipment, etc. During the study period we made no changes in our "basic sounds". In x-ray room 2 the sound environment consisted of "basic sounds" with superimposed selected music played via ceiling suspended loudspeakers. Thus, we changed the sound environment in the music room by adding music to the "basic sounds".

We made a specific order of the Compact Discs (CD) to be played, and the volume was fixed at a specified level, which made the music just audible.

The patients were consecutively included into the study and randomly assigned to the music and the non music group. The patients were not asked or informed in advance about our study of the sound environment or about playing music, and we did not draw the attention of the patients to the fact that there was music in the x-ray room. In order to avoid any bias we switched the sound environment of the two rooms after having included 100 patients. The protocol for the study was approved by the local ethical committee.

The music

The genre of music for the study was chosen from the experience of previous studies (5, 9, 10), after having listened to numerable CD`s and gained advice from the composer Niels Eje (14). We played soft classical music (15) or music composed by the composer Niels Eje (14). In other studies relaxing music has been defined as “low-pitched, a simple and direct musical rhythm, a tempo of approximately 60 beats per minute” (6) The patients and the staff involved had no influence on the choice of music, which was selected by the investigators of the study on the basis of available literature. There are several recommendations of the best suitable genre of music for patients in hospital settings (10, 13), but there are no evidence-based recommendations in this field so far.

Design

The patients were hospitalized on the day of the cardiac intervention. They were pre-medicated by an oral dose of 5 mg Diazepam and were transferred to the Cardiac Laboratory 1 hour later. All patients undergoing coronary examination or intervention during the period of the study were consecutively included. However, we excluded patients, who were hard of hearing, did not understand the Danish language, asked for the music to be turned off (in the music sound environment) or asked for music to be played (in the basic sound environment). The patients were questioned immediately after the cardiac procedure at the Cardiac Laboratory by nurses, who were specifically trained in how and when to question the patients. The questions of the questionnaire for the patients focused on the following items:

- The patients opinion of the sound environment (pleasant / unpleasant / no opinion).
- The sounds spontaneously noticed in the room during the procedure (telephone, unpacking, music, heartbeat etc.)
- The effect of the music in relation to their state of well-being?
- The like or dislike of the music they heard (in music sound environment) - or “would they have liked to listen to music - if possible?” (in basic sound environment) – the patients were asked to motivate their answer.

Results

Demographics:

193 patients were included, men (64%) and women (36%). The average of age for both sexes was 62 years, and the range of age was 30 – 89. The number of patients in basic sound environment and music sound environment was 94 and 99, respectively. One patient asked for music in basic sound environment – and was excluded.

No patients asked for the music to be turned off in the music sound environment. One of the staff asked for the music to be turned off in the music sound environment. In the music group 68 patients (69%) experienced, that music was of major positive importance for their feeling of well-being. Seven patients (7%) expressed that the music was of minor positive importance. None experienced a negative correlation between music and well-being, whereas 24 patients (24%) had no opinion of the correlation of music and the feeling of well-being. In the music sound environment 90 patients (91%) found that the sound environment was pleasant compared to 53 patients (56%) in the basic sound environment. One patient (1%) found that the sound environment was unpleasant in music sound environment. No patients (0%) found the sound environment unpleasant in basic sound environment (N.S.). Eight patients (8%) in the music sound environment had no opinion on the sound environment compared to 41 (44%) with no opinion in the basic sound environment ($p < 0.05$). In Figure 1 the results of the patients' opinion of the sound environment is graphically presented.

Which sounds did the patients notice?

<u>Basic sound environment</u>	<u>Music sound environment</u>
The heartbeat 23%	The heartbeat 17%
The telephone ringing 1%	The telephone ringing 2%
Talking of the staff 20%	Talking of the staff 15%
Unpacking of equipment 4%	Unpacking of equipment 0%
Nothing special 18%	Nothing special 10%
	The music 62%

There was no significant difference ($p > 0.05$) between the observation of the sounds in the two sound environments. Sixty two percent of the patients in the music group noticed the music spontaneously – although they were not notified about the presence of music in the room in advance. During the interviews we experienced spontaneous remarks about the music played during the coronary intervention. Typical remarks were: “The music made me feel relaxed”, “I felt safe”, “It gave me a good feeling” and “It helped me think of other things”.

Discussion

At the Cardiac Laboratory in Aalborg, Denmark, we have focused on patient environment. We care about the surroundings of the patient with regard to sounds, colours, light intensity and temperature. Thus the sound environment is for us a natural and obvious parameter to watch. When arriving to the Cardiac Laboratory our lightly sedated, but fully awake patients meet a world of total strangeness: x-ray equipment, computers, and sterile rooms. The staff is dressed up in sterile clothing with caps and masks. The laboratory represents an area with unfamiliar sounds and noises from the x-ray equipment, unpacking of sterile equipment, contrast-syringe, instruments and sounds from the use of computers – as well as a massive hi-tech visual impression. It is of major importance to focus on improvement of the quality of care – also with regard to the surroundings. Linda Heitz (10) says: “It is nice to experience something familiar, music, when so much of what a person experiences in the hospital is not”.

In our study 82% of the patients liked the music we had chosen – although they had no influence on the choice of music. The fact that the majority of our patients liked the music they heard may be explained by: the source of the sound, the type of music played and the level of the sound. Music played via ceiling suspended loudspeakers (and not headphones or sound pillows) does not isolate the patient from staff and surroundings. The music will be at a pleasant “distance” and will never be disturbing or “dangerous” (e.g. emotionally provocative). This applies to the level of the sound as well. We choose a sound level just audible, which made the music a supplement to the other sounds in the room, and the music never claimed the attention of the patient. Finally the type of music was specially selected. The composer Niels Eje (14) creates music specially designed for patients in hospital settings. This music is soft, image-creating and stimulating, and it provides a relaxing atmosphere. The composition of his music is designed to bypass the taste of ages, sexes and general opinion of genres of music. In this study we played several pieces of his compositions together with selected classical pieces, which fulfilled the same criteria.

The choice of the music is important although no evidence based recommendations are available. The right music for the purpose in question should be selected either by following the patients own wish or by following the advice of experienced composers of designed music- and sound environment for hospital patients (14). We have chosen that the music genre should be able to bypass all types of music related to age, sex and taste. We have in the choice of music of this study adapted the theories of the music organisation “Musica Humana” (16) - a project-organization that organizes and initiates studies of sound environment in hospitals. This organization is committed to creating and documenting a new sound environment for patients. The studies of the organization analyze the use of a created sound- and music environment as a supplement to the basic sounds. Others have recommended that the patients choose the genre of music individually, e.g. Rebecca O’Sullivan (13), Linda Heitz (10) and Carol Bolwerk et al. (5) – based on the opinion that “The nature of the music will determine the effect the music has on the listener” (5), “Individuals will react differently to the same music..” (10) and “Music should be adapted to each patient’s needs...” (13). Our study showed however that it is possible to find music that will satisfy and be of therapeutic use for the majority of the patients – at least within the category of the cardiac patient group.

In our study we found no difference between our two patient groups with respect to the frequency of spontaneously notified sounds. We had expected that the observation of the sounds would be less in music sound environment compared to the basic sound environment. Our expectations were a.o. based on Rebecca O’Sullivan (13) who states: “If ones attention focuses on the music all other stimuli will be cancelled, therefore providing distraction therapy reducing awareness of the sounds of ventilators and alarms.” Although 62% of the patients in the music group noticed the music the awareness of other sounds remained unchanged. Nevertheless, there was a clear difference between the patients’ opinion of the sound environment in the two rooms – and the only difference we made was to add music to the basic sounds. Our results supports that certain types of music may be superimposed on the basic sound environment in a non-dominant way and still have a major impact on patients.

Most patients had negative expectations with regard to listening to music in relation to their stay at the Cardiac Laboratory. They had no relevant insight in the positive effect that music could bring to them in relation to the therapeutic procedure. We conclude that patients should not be asked for the permission of playing specially selected music – as their expectations do not match their experience. Granted that the music has the right qualities the majority of the patients will have a

positive experience – regardless of their expectations. It is our experience that it may be difficult for the patients to choose the type of music best suited for the coronary intervention – as they have no impression of their needs in the given situation. Many of our patients agreed that the music they heard during the coronary intervention was perfect for this use, but they would be reluctant to listen to this genre of music at home. Based on our results we recommend that specially selected or composed music is chosen for a given therapeutic situation – and allowance for playing the music is not needed to be asked for on beforehand.

Several studies have examined the effects of music with focus on physiological and psychological changes (1, 2, 3, 4, 6, 10, 11, 13), and there seems to be a great variety of the measured effects. In our study we focused on the patients statements on well-being and total experience of the stay in relation to the sound environment. Most cardiac patients are medicated with drugs which slower the pulse and blood pressure and the measurement of these parameters might be of uncertain value in relation to the effect of music and we have therefore focused on the psychological benefits of listening to music. In addition we find it of great importance as a nursing intervention to focus on the possible improvement of the psychological feeling of well-being of our patients.

We have learned from this study that specially selected or composed music may be a strong and positive factor for patient well-being and their experience of the sound environment. The results of this study support the fact that music is a useful tool for improved patient care. In relation to music in a hospital environment Jill White (6) states: “it takes very little time to implement, it is inexpensive, and it is an intervention the clinical nurse specialist can help patients to use independently in a very short time.” In a Cardiac Laboratory there are many unavoidable stressors. It is of great importance to use our knowledge of the positive effects of specially selected music to minimize stressors and improve patient comfort and possibly morbidity in relation to invasive cardiac procedures. In conclusion our study showed that it is possible to improve the sound environment by the use of specially selected or composed music superimposed on the basic sound environment. The use of music caused a significant improvement of the patient experience of the stay in our laboratory. Based on our results medical staff needs strong arguments **not** to play music and **not** to consider the sound environment in the Cardiac laboratory environment. We recommend the implementation of a standard procedure for improvement of the sound environment by using specially selected or composed music.

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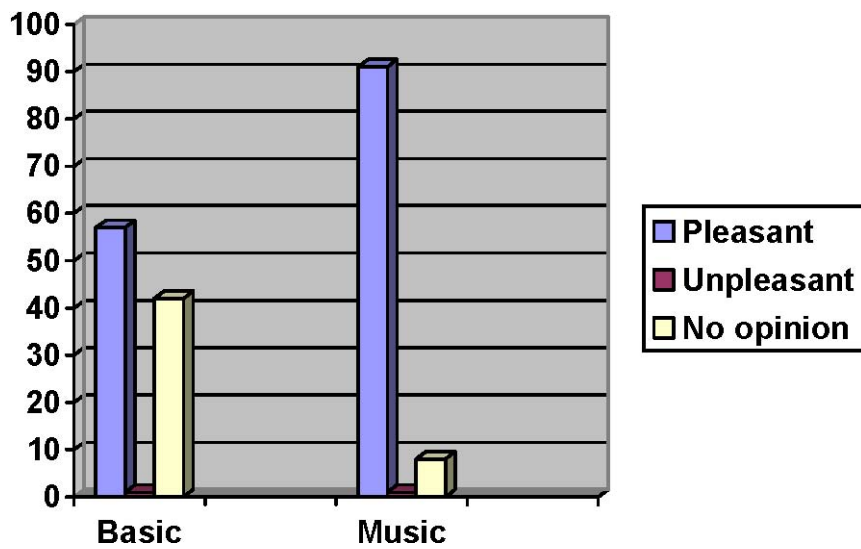


Fig. 1 The patients`experience of the sound environment. The opinions of the patients are shown in basic sound environment as well as in music sound.

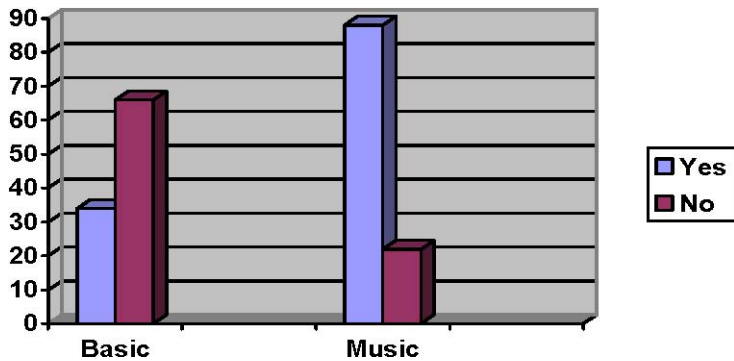


Fig. 2 Expectations versus experience of being in music sound environment. In the questionnaire the patients in basic sound environment were asked if they would have liked to listen to music, if possible. In basic sound environment we asked the patients if they were satisfied with having listened to music during the coronary intervention.

References

1. Cook, Janet D. "The Therapeutic Use of Music: A Literature Review". Nursing Forum. Vol. 20. No. 3. 1981.
2. Evans, D. "Review: Music as a single session intervention reduces anxiety and respiratory rate in patients admitted to hospital". Evidence Based Nursing. Volume 5, July 2002.
3. Barnason, Susan et al. "The effects of music interventions on anxiety in the patient after coronary artery bypass grafting". 1995. HEART & LUNG.
4. Zimmerman, Lani et al. "The effects of music interventions on anxiety in the patient after coronary artery bypass grafting". HEART & LUNG. March/April 1995, vol. 24, no 2.
5. Bolwerk, Carol A. Lueders. "Effects of relaxing music on state anxiety in myocardial infarction patients". Critical Care Nursing. Vol. 13. 1990.
6. White, Jill M. "Music Therapy: An intervention to reduce anxiety in the myocardial infarction patient." Clinical Nurse Specialist, Vol. 6, no 2, 1992
7. Guzetta, C. E. "Effects of relaxation and music therapy on patients in a coronary care unit with presumptive acute myocardial infarction". HEART & LUNG, vol. 17, no 5, 1998
8. Zimmermann, Lani M, et al. "Effects of music on patient anxiety in coronary care units". HEART & LUNG, vol. 17, no. 5, 1988.
9. White, Jill M. "State of the Science of Music Interventions". Critical Care Nursing Clinics of North America, vol. 12, no 2, June 2000
10. Heitz, Linda et al. "Effect of Music Therapy in the Postanesthesia Care Unit: A Nursing Intervention". Journal of Post Anesthesia Nursing, Vol. 7, No 1. 1992
11. Evans, David. "The effectiveness of music as an intervention for hospital patients: a systematic review". Journal of Advanced Nursing, 37 (1), 8-18. 2002
12. Updike, Phyllis. "Music Therapy Results for ICU Patients". Dimensions of Critical Care Nursing. Vol. 9, No. 1. 1990.
13. O'Sullivan, Rebecca. "A musical road to recovery: Music in intensive care". 1991. Intensive Care Nursing.
14. Niels Eje – Danish composer who has designed music programmes for patients in hospital settings – intensive care units, recovery wards and cardiac laboratory. The music is specially designed for patients and consists of a symbiosis of sounds from nature and special composed music. The music programme bypasses all genres of music and generates a stimulating, image-creating and relaxing atmosphere.
15. Niels Eje "Day and Night" (Specially composed- and selected classical music) Niels Eje "MusiCure" – designed sound and music environment
16. Musica Humana – a project organization with the purpose of creating and producing documentary evidence of the use of specially created music for hospitals. The organization is based upon a close co-operation between experts within medicine, nursing, psychology and music composition. Web-side to be connected: www.musicahumana.dk