



Effects of music therapy on pain and anxiety in patients undergoing port catheter placement procedure



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Available online 1 September 2013

KEYWORDS

Music intervention;
Invasive medical
procedures;
Stress hormones;
Pain;
Anxiety

Summary

Background: Patients scheduled to invasive medical procedures experience high levels of anxiety, which may lead to increased perceptions of pain and vital sign instability throughout.

Aims: To examine the effect of a music intervention (MI) on stress hormones, physiologic parameters, pain, and anxiety state before and during port catheter placement procedures (PCPPs).

Methods: We conducted a prospective, randomized, controlled study in 100 oncology patients, who were randomly assigned to an MI group ($n=50$) or a control group ($n=50$). The effects of music were assessed by determination of serum cortisol and adrenocorticotrophic hormone (ACTH) levels, heart and respiratory rate (HR, RR) and systolic and diastolic blood pressure (SBP, DBP), on arrival in the surgical intervention room, as well as immediately prior to and immediately after the PCPP, in both groups. Furthermore, pain and anxiety levels were identified using visual analogue scale and state-trait anxiety inventory scales.

Results: On arrival, there were no differences between the patients in terms of serum cortisol and ACTH levels, HR, RR, SBP, DBP and anxiety levels. There were significant reductions in hormone levels ($p < 0.05$ for all), HR ($p < 0.001$), RR ($p < 0.001$), SBP ($p < 0.05$) and DBP ($p < 0.05$), immediately prior to and immediately after the PCPP in participants in the MI group compared to those in the control group. Furthermore, music led to a significant reduction in pain ($p < 0.05$) and anxiety scores ($p < 0.05$) in the MI group compared to control group.

Conclusion: During invasive medical procedures, MI significantly decreases stress hormone levels, physiological parameters, acute procedural pain and anxiety.

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Introduction

Patients scheduled to undergo diagnostic and/or invasive procedures are often frightened and anxious, which may influence physiologic responses, such as respiratory rate (RR), heart rate (HR), blood pressure (BP), perceptions of pain, and plasma concentrations of stress hormones.^{1–3}

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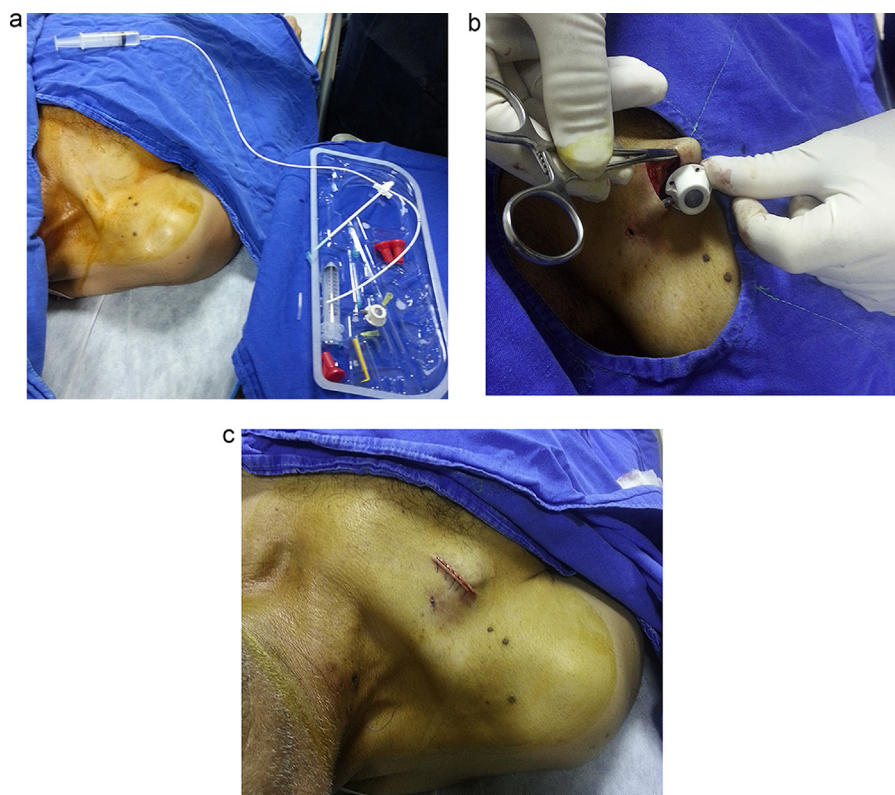


Fig. 1 (a–c) Port catheter placement procedure.

Physiologic and psychological instability may increase the length of the procedure and the amount of sedation required. Moreover, a tense patient may find it problematic to cooperate with the team, thereby adding technical difficulties to the procedure.^{4,5} Therefore, to decrease pre and postoperative emotional distress, and thereby conduct an effective interventional procedure, it is important to address anxiety and fright.

In recent decades, there has been a growing interest in complementary medicine for adjunctive interventions in the care of acute care patients, in order to create a more therapeutic and healing environment. Many medical studies have focused on goals that include increasing relaxation, decreasing pain, reducing anxiety, increasing coping skills, providing procedural support, and improving quality of life.⁶ Music has been used in an attempt to achieve these goals.^{1–6} The use of music has been an essential part of healing since the beginning of cultural history, and the earliest known evidence for this phenomenon comes from descriptions of therapeutic musical interventions (MIs) found in cuneiform writings in Mesopotamia, which date from 4000 BC.⁷ In recent years, interest in the potential therapeutic uses of music has grown,⁴ with MI being used for individuals of all ages and in specialties such as intensive care, cancer care, maternity, pain management, dementia, palliative care, oncology, surgery, and invasive procedures.^{4,5} Listening to music has proved successful with regard to decreasing pain, stress, and anxiety in a variety of clinical settings, and its effects have been observed as decreases in HR, RR, BP, metabolic rate, oxygen consumption,

skeletal tension, stress hormones levels, and sweat gland activity.⁴

A port catheter is an implanted venous access device, also known as an implanted port, and is used for patients who require frequent or continuous chemotherapy administration. Port catheter placement is invasive, and is among the most frequently performed medical procedures in oncology patients. It is usually done under local anesthesia or conscious sedation, and involves making a 3 cm skin incision on the chest wall for the port pocket, and a 5 mm incision in the lower neck to enter the vein. The port is placed completely inside the body. One end of the catheter is inserted into the vein, while the other is connected to the portal, under the skin^{8,9} (Fig. 1a–c).

Invasive medical procedures are known to have a negative impact on patients by producing emotional distress, anxiety and fright, which leads to more pain and an increase in stress hormones.^{1–7} High levels of anxiety and fright may result in more difficult/uncomfortable/incomplete procedures. A variety of sedative drugs are often used to decrease pre and intraoperative emotional distress and anxiety; however, these medications frequently result in side effects, such as respiratory depression and decreased BP. However, music, which has been used for many years to reduce anxiety and promote relaxation, does not cause any side effects.

The purpose of this study was to evaluate the effect of MI on stress hormones, physiological parameters, acute procedural pain, and anxiety in patients undergoing port catheter placement procedure (PCPP).

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