

The effect of sufi music on sedation in patients under spinal anesthesia during orthopedic surgery

The effect of music on patients undergoing orthopedic surgery

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Abstract

Aim: Music is the preferred method of sedation due to its noninvasive nature, affordable cost, and easy application. In this study, we aimed to compare music therapy with a control (non-music) group in terms of perioperative sedation requirements, anxiety levels, and patient satisfaction starting from the preoperative period in patients who underwent orthopedic surgery under spinal anesthesia.

Material and Methods: This study was carried out prospectively with 50 patients in the ASA I-II risk group, aged 18-60 years and will undergo elective non-oncological orthopedic surgery. Patients taken to the preparation room were randomly classified into two groups. Propofol (FRESENIUS-Germany) infusion was started at 1 mg/kg/hour in patients who underwent spinal anesthesia in the operation room. The Bispectral Index Monitor™ (BIS) was used to verify sedation. Hemodynamic data and BIS values were recorded preoperatively (t1) and during spinal anesthesia (t2). Perioperative values were recorded at the 5th, 15th, 30th, 60th minute (t3, t4, t5, t6) and postoperative 30th minute (t7).

Results: There was no statistically significant difference between patients' demographic characteristics and the duration of surgery. Although lower values were detected in the music group in terms of heart rate (HR) and mean arterial pressure (MAP) at all times, the difference between the groups was not statistically significant. When evaluated in terms of BIS scores, significantly lower values were recorded in the music group at all times. When Ramsey Sedation Scores were compared, while high scores were obtained at t2 and after in the music group at all times, the results at t5, t6, t7 times were found to be significantly higher.

Discussion: Our study showed that listening to Sufi music starting from the preoperative period has positive effects on anxiety. Considering the negative effects of anxiety on the experience of anesthesia and operation success, it can be said that the more frequent use of a non-invasive method such as music can reduce the anxiety of the operation.

Keywords

Music therapy; Spinal anesthesia; Turkish sufi music; Perioperative anxiety

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Introduction

Spinal anesthesia is more frequently used today as it reduces intraoperative blood loss, has less common side effects such as prolonged sedation, nausea-vomiting, respiratory depression that we encounter in general anesthesia, reduces morbidity in high-risk patients, and its analgesic effect continues in the postoperative period [1]. In the preoperative period, anxiety is a natural process, and many methods are used to prevent this situation. It is known that anxiety negatively affects patients in the perioperative period [2,3]. It has been reported that the sounds of the surgical team and surgical instruments or spinal anesthesia in the operation room increase patient anxiety [2]. This situation can become stronger, particularly in orthopedic surgeries, where surgical tools such as hammer and drill are frequently used.

In the studies conducted, the effectiveness of non-pharmacological methods used in reducing the preoperative anxiety in patients has been investigated with various studies. Among these methods, giving information preoperatively, showing a short film about the surgery and the hospital, and having pediatric patients wear a mask accompanied by their family can be counted [4,5]. It has been shown that anxiety and postoperative pain are less in elderly patients who receive perioperative psychological support and music [6].

Music is a more acceptable sedation method than other pharmacological methods because of its noninvasive nature, cost-effectiveness, and easy application [7,8]. In addition to the limited number of studies on spinal anesthesia and music, researches have been conducted in existing studies by making patients listen to the music of their choice, favorite music, or classical music. In our country, studies on music date back to much older times. Particularly in Turkish-Islamic civilizations, there are works showing that Sufi Music was commonly used in the treatment of various psychiatric diseases and in hospitals. However, today, there are a limited number of studies in which Sufi Music is used for treatment and rehabilitation [9].

In this study, we aimed to compare music therapy with a control (non-music) group, starting from the preoperative period and continuing in the perioperative period, in terms of perioperative sedation requirements, anxiety levels, and patient satisfaction in patients who underwent orthopedic surgery under spinal anesthesia.

Material and Methods

This study was carried out prospectively in 50 patients in the ASA I-II risk group, aged 18-60, who will undergo elective non-oncologic orthopedic surgery, with the approval of the local ethics committee and informed consent from the patients. The exclusion criteria were identified as those who have hearing loss, are professional music practitioners, are using medications that can affect the hypothalamo-hypophyseal and sympathetic system. In addition, patients who did not like this type of music and stated that they did not want to listen were not included in the study. New patients were recruited in place of patients who were excluded for any reason to reach the planned sample size. Patients who were taken to the preparation room 30 minutes preoperatively were randomly classified into two groups as the music group (Group M) and the control group (Group K). The

software on the "www.randomizer.org" website was used for randomization. Hemodynamic data and RSS (Ramsey Sedation Scale) values of the patients were noted in the preparation room (t1). The patients in Group M were made listen to works from Turkish Sufi Music Hüseyini Mode with an mp3 player (SONY NVZ-B172), using headsets. The patients were told to adjust the volume of the music according to their preferences. An oxygen mask was worn on both group (M) and group (K), and oxygen was given at a rate of 3lt/min. Both groups received the 0.08 mg/kg midazolam (Zolamid, DEFARMA-Turkey) intravenously (IV) and given with a slow bolus. Patients were monitored and started to wait. Patients sedated with midazolam in the anesthesia preparation room were taken to the operation room 30 minutes later.

The patients who were transferred to the operating room and whose electrocardiography (ECG), non-invasive blood pressure, and peripheral oxygen saturation were monitored were made to continue to inhale 3 lt/min of oxygen with a face mask. Covidien Bispectral Index Monitor™ (BIS) (Medtronic Minimally Invasive Therapies, Minneapolis, MN) was used to confirm moderate sedation in both groups (65-75). Propofol (FRESENIUS-Germany) infusion was started to the patients at a rate of 1 mg/kg/hour with the perfuser. Spinal anesthesia was provided to the patients, who were in the lateral decubitus position, by intrathecal administration of 2.5 ml 0.5% bupivacaine with a 25 gauge needle at the L3-4 or L4-5 level. Surgery was initiated when the appropriate block-level occurred in patients who were controlled with motor block modified Bromage score and a sensory block pinprick test. Hemodynamic data and BIS values were recorded preoperative (t1) and during spinal anesthesia (t2). Perioperative 5th, 15th, 30th, 60th minute (t3, t4, t5, t6) and postoperative 30th minute (t7) values were recorded.

Obtained data were evaluated using the "SPSS for Windows 13.0" software. The data were expressed as a percentage, mean ± standard deviation. In the comparison of the data obtained by measurement, data conforming to the normal distribution were compared with the "Student t- test", and the data not conforming to the normal distribution with the "Mann-Whitney U" test. P <0.05 was considered a significant result.

Ethics committee

The study protocol was approved by the Karadeniz Technical University ethics committee (2012/132).

Results

A total of 61 patients were included in the study. Since 2 patients had hearing loss, and 4 patients had to be switched to general anesthesia, and 5 patients who did not want to participate in the study were excluded. Data were analyzed for 50 patients (Figure 1).

No statistically significant difference was found between the demographic characteristics of the patients whose age, gender, body mass index (BMI), ASA scores, and duration of surgery were evaluated (Table 1).

Although lower values were detected in the music group in terms of heart rate (HR) and mean arterial pressure (MAP) at all times, the difference between the groups was not statistically significant (p=0.538) (Figure 2).

When Ramsey Sedation Scores were compared, while high

scores were obtained in the music group at all times at t2 and after, the results at t5, t6, t7 times were considered to be significantly higher ($p=0.019$, $p = 0.047$, $p = 0.012$, respectively) (Figure 3).

Table 1. Patients' General Characteristics and Intraoperative Data

	Group M (n=25)	Group K (n=25)	p
Age	41,96±11,41	43,00±11,26	0,747
Gender (F/M)	11/14	13/12	0,777
BMI (kg/m ²)	28,4 (19 - 43,6)	28,2 (18,4 - 44,7)	0,865
ASA I-II	16/9	17/8	
Operation time (min)	58,12±12,11	56,54±13,11	0,624

Data of patients are expressed as numbers, mean ± standard deviation. BMI; body mass index. ASA; American Society of Anesthesiologists, M; Male, F; Female.

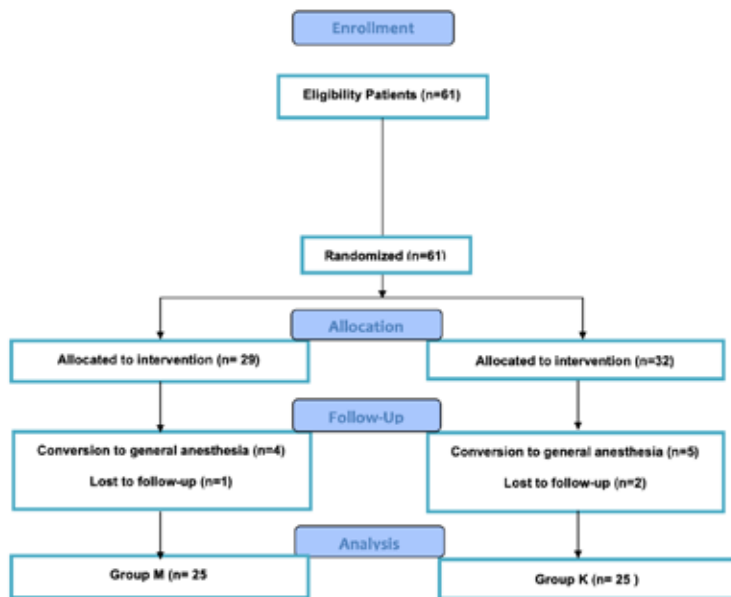


Figure 1. Consolidated Standards of Reporting Trials (CONSORT) flowchart of participant involvement

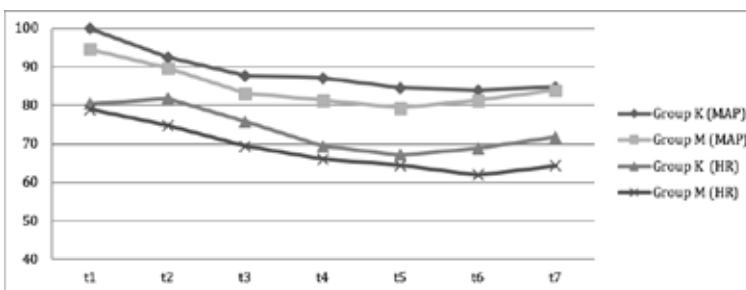


Figure 2. Mean arterial pressure (MAP) and heart rate (HR) trend throughout nerve block administration between music and control groups

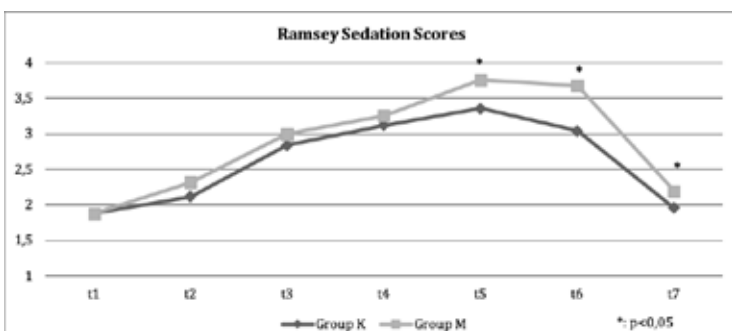


Figure 3. Distributions of Ramsey Sedation Scores (RSS) value over time

Discussion

This prospective, randomized and controlled study was conducted after ethics committee approval was obtained. The main finding of the study is that the respiratory rate and BIS values are significantly lower and RSS is significantly higher in the music group. No significant difference was found between the heart rate count, mean arterial pressure, and saturation values at the measurement times.

Different rates of anxiolysis have been achieved in studies using non-pharmacological methods to reduce anxiety due to anesthesia or surgery. The sedative effect of music therapy and particularly classical Turkish music has been known for many years. Our study has shown that classical Turkish music can be helpful in reducing anxiety in patients undergoing orthopedic surgery under spinal anesthesia.

Surgery anxiety depends on many factors. In adult patients, many factors related to anesthesia, surgical procedure, postoperative pain thought and postoperative rehabilitation process affect anxiety. The high level of anxiety negatively affects the success of the surgery, patient comfort, and patient satisfaction. Although pharmacological premedication can be used to combat anxiety non-invasive, pleasant methods should be preferred. The primary and side effects of the agents used for pharmacological premedication may cause undesirable results.

Although the use of music in medicine dates back many years, music has been studied frequently in recent years to prevent anxiety due to reasons such as being non-invasive, cheap, and having no side effects. The effect of music on all classifications of patients, from intensive care patients who are followed up with a mechanical ventilator, to patients under spinal anesthesia, from the pediatric age group to the elderly population, is investigated [6,10-12].

Although music genres, age groups, sample sizes, clinical situations, and situations that cause anxiety are different, the effect of music therapy on reducing anxiety is generally mentioned.

The assessment of anxiety is difficult due to the presence of confounding factors, differences in past experiences, and personality factors. Various questionnaires have been conducted to understand whether the level of anxiety is immediate or general. The relationship between state- and trait anxiety has been tried to be evaluated in the questionnaires. The evaluations made, although their validity has been proven for the society studied, raise questions in terms of their objectivity. The disadvantages of pharmacological methods used to reduce anxiety are respiratory and hemodynamic adverse effects and the possibility of extra anxiety caused by the procedure.

In studies where music was used to deal with anxiety, no difference was found between hemodynamic and respiratory data of the patients [1,13,14]. In a study investigating the effects of music, silence, and ambient noise, no difference was found between the number of respiration. In our study, no difference was found between the heart rate, mean arterial pressure, and peripheral oxygen saturation of the patients, and their respiratory rate was lower in the music group at all times. Despite the difference in respiratory rates, the saturation values of the patients did not change. The difference between

the respiratory numbers in our study can be attributed to the more anxiolytic effect of traditional Sufi music we use.

The effects of the modes used in traditional Turkish music on the human psyche have been known for many years. And Farabi has described in his works what mode of this music genre has what kind of effects. According to these results, which are mostly based on experience, the Hüseyni mode music we made our patients listen to in our study, is known for its effects of peace, tranquility, comfort, and sleep.

The bispectral index is an EEG parameter and it is an approved method that can show the anesthetic effect. It offers clinicians the opportunity to objectively evaluate the sedative and hypnotic effects of anesthetic medications. In our study, the distinction between BIS values has an important place in eliminating subjective data.

In a study investigating the sedative effects of music in patients undergoing septorhinoplasty with a methodology similar to our study, significant BIS score changes were detected in the music group [15]. The BIS data in our study are compatible with the aforementioned study.

In another study investigating the effect of music, white noise, and ambient noise on propofol consumption in patients who underwent spinal anesthesia in patient-controlled sedation, propofol consumption was found to be significantly lower in the music group, and no significant difference was encountered between patients [16]. In our study, the patients evaluated with the Ramsey sedation scale had higher perioperative 30th and 60th minute and postoperative 30th-minute sedation scores than the control group. In the studies aforementioned, in which the level of anxiety was evaluated subjectively, conflicting results with our study were considered normal.

It is obvious that it is difficult to achieve standardization in studies conducted with music. There are many confounding factors in the planning and implementation of the study. The absence of a purification of ambient sounds (silence), called the white noise group in our study, and the non-standardization of sound intensity can be considered a shortcoming. In further studies, we believe that it is possible to clarify how much, what intensity, and which type of music can be used by investigating different types of music, different surgical types, and different sound intensities.

Our study showed that making listen to traditional Sufi music from the preoperative period to the perioperative and postoperative period has positive effects on anxiety. Considering the negative effects of anxiety on the experience of anesthesia and operation success, it can be said that the more frequent use of a non-invasive method such as music can reduce the anxiety of the operation.

Scientific Responsibility Statement

The authors declare that they are responsible for the article's scientific content including study design, data collection, analysis and interpretation, writing, some of the main line, or all of the preparation and scientific review of the contents and approval of the final version of the article.

Animal and human rights statement

All procedures performed in this study were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. No animal or human studies were carried out by the authors for this article.

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Conflict of interest

None of the authors received any type of financial support that could be considered potential conflict of interest regarding the manuscript or its submission.

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