

The effects of visual and auditory music interventions on peroperative anxiety in daily surgery

Music and anxiety

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Abstract

Aim: In this study, we aimed to reveal the effects of auditory and visual music concerns on peroperative anxiety evaluation in day-to-day hand surgery patients who underwent infraclavicular block.

Material and Methods: One hundred twenty patients who underwent daily forearm, wrist or hand surgery and infraclavicular block were included in the study. The patients were divided into 3 groups (Group K, Group I, Group G). The first STAI assessment was performed before the block and after block and the patients were taken to the operating room. Patients were put on their headphones and were not removed until the end of the case. Group K was given a headset to isolate the ambient sound, Group I was given a stereo headset connected to the tablet (iPad, Apple, USA), and a list of music was opened, and Group G was connected to the tablet. At the end of the case, STAI evaluation was done.

Results: In comparisons between groups, it was found that there was a statistically significant difference between the groups in terms of postop STAI-1 scores ($p < 0.05$), the music group scores were lower than the other groups. In in-group comparisons, in all groups, a statistically significant difference was found between the measurement times in terms of STAI-1 values ($p < 0.05$). There was a statistically significant difference ($p < 0.05$) between the measurement times in terms of STAI-2 values in music group patients.

Discussion: In our study, we found that visual and auditory music was effective in reducing peroperative anxiety.

Keywords

Anesthesia; Anxiety; Music

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Introduction

The perioperative period can cause problems in the vast majority of patients due to the physical trauma it causes, as well as fears and increased anxiety associated with surgical procedures. This situation can be observed more frequently due to the operation sounds and noises especially in the operating rooms where bone operations are performed such as orthopedics and hand surgery. These problems are tried to be overcome with the anxiolytic and sedative drugs or psychological preparation programs traditionally given to the patients before the surgical procedure. However, today, anesthesia applications are increasing day by day, and there is not much time left for psychological preparation programs. Applied anxiolytic and sedative drugs, besides the anxiolytic benefit they provide, may cause various undesirable effects and prolongation of recovery period, especially in operations performed under regional anesthesia. [1-5]. It has long been known that music has calming effect even on animals. It is stated in many clinical studies that it is a safe, effective, and non-invasive aid in relieving pain and anxiety. Although the effects of preoperative and intraoperative anxiety have been demonstrated by anesthesiologists, studies that say that anxiety levels will not change between groups who listen to music and do not listen, under conditions where there is silence in the operating room cause controversy on this subject to continue [1-5].

In this study, it was aimed to reveal the effects of auditory and visual music concerns on anxiety evaluation in day-to-day hand surgery patients who underwent infraclavicular block.

Material and Methods

One hundred twenty patients who were identified in the power analysis to be performed forearm, wrist or hand surgery and infraclavicular block were enrolled prospectively after obtaining an ethical committee and written informed consent. Inclusion criteria are 18-65 years old, American Society of Anesthesiology (ASA) 1 to 3 and body mass index from 20 to 30 kg / m². Exclusion criteria are pre-existing neuropathy, coagulopathy, neurological or neuromuscular disease, hepatic or kidney failure, local anesthetic allergy, pregnancy, previous surgery in the infraclavicular region, affective disorder, substance abuse, hearing or vision loss, and professional music education and patients who do not want to wear headphones during the intraoperative period during patient consent.

Randomization was done according to the randomization program on the web site www.random.org. The patients were divided into 3 groups (Group K, Group I, Group G) according to the randomization program. After patients arrived in the premedication room, an 18- or 20-gauge intravenous catheter was placed in the upper extremity opposite the surgical field. The first STAI assessment was made before the block. During the procedure, oxygen was given from the nasal cannula at 4 lt / min and saturation was observed with pulse oximetry, heartbeats were observed with ECG, and blood pressure were observed with non-invasive blood pressure measurement (Standard monitoring defined by ASA). Infraclavicular block was applied to all patients by the same person. For all patients, 10 cm nerve block needles (21G, Locoplex, Vygon, Ecouen, France), portable USG machine (Logiq E, General Electric, USA) and 6- to 13-MHz linear USG

linear probe were used. After skin asepsis was obtained, 2 ml of 2% lidocaine local anesthetic infiltration was routinely applied to the injection site, and the USG probe was placed in the infraclavicular fossa right next to the coracoid protrusion, and the image was taken in the midline on the short axis subclavian artery in the USG image. Using the in-plane technique, the tip of the 21-gauge, 10-cm block needle was advanced until it was dorsal to the artery. After confirming the location of the needle tip in the image section, 20 cc of local anesthetic was applied to the area under the subclavian artery with 0.05% bupivacaine. STAI evaluation was done for the patients holding the block for the second time and the patients were taken to the operating room. After performing standard ASA monitoring in the operating room, patients were put on their headphones that were not removed until the end of the case.

Group K was given a headset to isolate the ambient sound, Group I was given a stereo headset connected to the tablet (iPad, Apple, USA), and a list of music was opened, and Group G was connected to the tablet (iPad, Apple, USA). Stereo headphones and a list of music videos that the patient wanted to watch from the tablet were given until the end of the case. The blood pressure and pulse of a patient were recorded within 5 minutes throughout the case. At the end of the case, STAI evaluation was done for the patients for the third and last time and the data obtained were recorded.

Anxiety assessments of the patients were made with state and trait anxiety scale scores (STAI 1 and 2). STAI 1-2 is a patient anxiety assessment form with validity and reliability [6]. State Anxiety Scale (STAI 1) determines how the individual feels at a certain moment and under certain conditions. Trait Anxiety Scale (STAI 2) determines how the individual feels, regardless of the situation and circumstances. STAI 1-2 is an easy-to-apply inventory that can be answered by the individual. Both scales can be applied at the same time. In this case, the State Anxiety Scale should be given first and then Trait Anxiety Scale. Each question has four answers (no, some, many, all) and the test consists of twenty questions. The scales include 'direct (straight)' and 'inverted' expressions. While "reverse" expressions expressing positive feelings are scored, those with a weight value of 1 are converted to 4, and those with a weight value of 4 are converted to 1. In direct expressions expressing negative emotions, the answers of 4 indicate the height of anxiety. In inverted statements, answers of 4 indicate low anxiety, and answers of 1 indicate high anxiety. Ten (1, 2, 5, 8, 10, 11, 15, 16, 19, 20th items) on the State Anxiety Scale, and 7 on the Trait Anxiety Scale (21, 26, 27, 30, 33, 36, 39. substances) has an inverted expression. While scoring, two separate keys are prepared to determine the total weights of direct and inverted expressions. From the total weighted score obtained for direct expressions, the total weighted score of the reverse expressions is subtracted and a fixed value is added to this number. This value is 50 for the State Anxiety Scale and 35 for the Trait Anxiety Scale. The scoring is between 20 and 80, it is classified as low level 20-37 anxiety 38-44 medium level anxiety, and 45-80 high-level anxiety.

Statistical Analysis

The data were analyzed using IBM SPSS 25.0 statistical software. While evaluating the study data, the Chi-Square (χ^2) test

was used to compare descriptive statistical methods (frequency, percentage, mean, standard deviation, median, min-max) as well as qualitative data. The suitability of the data to normal distribution was evaluated by the Kolmogorov-Smirnov and the Shapiro-Wilk tests. One-Way Anova test was used for comparing the normally distributed quantitative data between groups, and the Repeated Measures Anova test for intra-group comparisons. Values with probability (P) less than $\alpha = 0.05$ are important and there is a difference between the groups, the larger values are insignificant and there is no difference between the groups.

Power Analysis

Power (Power) analysis was done with G * Power 3.1.9.4 statistical software; $n_1 = 31$, $n_2 = 34$, $n_3 = 32$, $\alpha = 0.05$, Effect Size (Effect size) $f = 0.35$; power (power $(1-\beta)$) = 0.87.

Results

There was no statistically significant difference in terms of demographic value ($p > 0.05$) (Table 1).

In terms of comparisons between groups, while there was no statistically significant difference in terms of Stai-1 scores in pre-block and preop values ($p > 0.05$), there was a statistically significant difference ($p < 0.05$) between the groups in terms of postop Stai-1 scores. Multiple comparison (post-hoc) tests were applied to find out which group/groups the difference originated from, and the scores of the music group patients were found to be statistically significantly lower than the other groups (Table 2).

In terms of in-group comparisons, in all groups, there was a statistically significant difference ($p < 0.05$) between the measurement times in terms of Stai-1 values. Multiple comparison (post-hoc) tests were applied to find out what measurement time/times the difference originated, while it was found that there was a statistically significant difference between the pre-block and preop values in the Control and Video groups, and the pre-block values were lower, while in the Music group, a statistically significant difference was found between the measured values.

In terms of comparisons between groups, it was found that there was no statistically significant difference between the groups in terms of Stai-2 scores at all measurement times ($p > 0.05$) (Table 2).

In-group comparisons results

While there was no statistically significant difference between the measurement times in terms of Stai-2 values in the control and video groups ($p > 0.05$), there was a statistically significant difference between the measurement times in terms of Stai-2 values in the music group patients ($p < 0.05$). Multiple comparison (post-hoc) tests were applied to find out which measurement time/times the difference originated, while it was found that there was a statistically significant difference between pre-block and postop values, and pre-block values were lower. While the music group was statistically measured between the values measured at all measurement times, a significant difference was found (Table 3).

Between groups comparisons results

While there was no statistically significant difference in terms of Stai-1 scores in pre-block and preop values ($p > 0.05$), there

was a statistically significant difference ($p < 0.05$) between the groups in terms of postop Stai-1 scores. Binary comparisons were made to find out in which group/groups the difference originated, and the Stai-1 Low rates of the patients with music group were found to be statistically significantly higher than the other groups (Table 3).

Table 1. Demographic values

		Control (n=31)	Music (n=34)	Video (n=32)	P
Gender	Women	11 (%35,5)	9 (%26,5)	9 (%28,1)	0,705 ^a
	Men	20 (%64,5)	25 (%73,5)	23 (%71,9)	
Age*		34,4 ± 11,8	32,1 ± 11,9	32,3 ± 9,4	0,674 ^b

a: Chi- Square Test, b: One-Way Anova, *: Mean ± SD ($p > 0.05$).

Table 2. In comparisons between groups and in-in groups STAI-1 and 2

STAI - 1	Control ^a (n=31)	Music ^b (n=34)	Video ^c (n=32)	P*	
Before Block ¹	41,4 ± 12,2	43,4 ± 12,4	39,1 ± 9,6	0,321	--
Preop ²	44,6 ± 13,3	47,6 ± 12,5	43,4 ± 9,3	0,340	--
Postop ³	41,7 ± 12,4	32,1 ± 6,4	39,9 ± 10,6	0,000	b and a-c
P**	0,000	0,000	0,000		
Diferences	1 and 2	All	1 and 2		
STAI - 2	Control ^a (n=31)	Music ^b (n=34)	Video ^c (n=32)	P*	
Before Block ¹	41,2 ± 6,9	41,2 ± 7,5	37,9 ± 7,2	0,112	
Preop ²	41,6 ± 8,1	39,6 ± 8,1	38,8 ± 6,5	0,343	
Postop ³	40,2 ± 7,5	37,9 ± 7,7	37,5 ± 6,8	0,282	
P**	0,118	0,003	0,227		
Diferences	--	1 and 3	--		

*: One-Way Anova, **: Repeated Measures Anova

Table 3. In comparisons between groups STAI-1 and 2

STAI - 1		Control (n=31)	Music (n=34)	Video (n=32)	P*
Before Block	Low	14 (%45,2)	11 (%32,4)	16 (%50,0)	0,435
	Medium	6 (%19,4)	7 (%20,6)	8 (%25,0)	
	High	11 (%35,5)	16 (%47,1)	8 (%25,0)	
Preop	Low	11 (%35,5)	10 (%29,4)	9 (%28,1)	0,134
	Medium	4 (%12,9)	3 (%8,8)	10 (%31,3)	
	High	16 (%51,6)	21 (%61,8)	13 (%40,6)	
Postop	Low	15 (%48,4)	28 (%82,4)	16 (%50,0)	0,011
	Medium	4 (%12,9)	4 (%11,8)	7 (%21,9)	
	High	12 (%38,7)	2 (%5,9)	9 (%28,1)	
STAI - 2		Control (n=31)	Music (n=34)	Video (n=32)	P*
Before Block	Low	8 (%25,8)	13 (%38,2)	16 (%50,0)	0,087
	Medium	10 (%32,3)	9 (%26,5)	12 (%37,5)	
	High	13 (%41,9)	12 (%35,3)	4 (%12,5)	
Preop	Low	10 (%32,3)	16 (%47,1)	11 (%34,4)	0,093
	Medium	10 (%32,3)	7 (%20,6)	16 (%50,0)	
	High	11 (%35,5)	11 (%32,4)	5 (%15,6)	
Postop	Low	11 (%35,5)	19 (%55,9)	20 (%62,5)	0,088
	Medium	9 (%29,0)	11 (%32,4)	7 (%21,9)	
	High	11 (%35,5)	4 (%11,8)	5 (%15,6)	

*: Chi-Square Test

Discussion

In this study, we aimed to reveal the effects of auditory and visual music concerns on anxiety evaluation in day-to-day hand surgery patients who underwent infraclavicular block with STAI test. According to the control group, we can say that visual and auditory concerns are effective in relieving anxiety and that the music group shows a more effective decrease in anxiety than the other two groups. Although our findings are similar to the previous studies on this subject, the differences in the evaluation scales, study group and conditions did not affect our achievement of the same result.

The systematic reviews and studies show that music intervention can have an effect on reducing patient anxiety and pain in the perioperative setting. It also has been reported that patients' postoperative recovery includes, among other things, regaining control over physical and psychological functions such as pain or anxiety [5-12].

The positive effects of music intervention have been likened to patient-controlled analgesia, [4]. And music could be called "audioanalgesia," "audioanxiolytic," or "audio relaxation." Although patients' selection of the type of music has been advocated by some, the Cochrane review found that the positive effect of music was similar in studies in which patients selected the type of music and those in which patients did not choose the type of music [4]. Although there are many studies and evaluations for different surgical interventions or non-operating room interventions related to the subject, the variability of the selected music type in children and adults or the physiological variables depending on the type of music chosen by the patient, the differences in the evaluation methods, studies on such situations are still ongoing. [1-11, 7-12].

In our group where music is performed with video visuals, the fact that the values are higher in our group than the music is performed indicates that the visuals selected in cases with high brain activity such as sedation and pain may also be effective. Along with these, we also think that these results can be verified more precisely by evaluating the brain functions using the technological devices such as BIS, EEG, and the differences of the selected music types and visuals, as well as the wave activations that occur during this process. In our study, we could not use monitors where high brain functions such as BIS and EEG can be evaluated, and the study may be limited. We are of the opinion that studies such as BIS and EEG, which include personal differences and variable music, video images, can be conducted on this subject.

Conclusion

In our study, we found that the visual and auditory music concerns were effective in reducing perioperative anxiety in the perioperative period and we think that comprehensive studies can be conducted on the subject.

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.

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Conflict of interest

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