RESEARCH PAPER

Effect of Music Therapy on Preoperative Anxiety in Patients Undergoing Elective Lower Segment Cesarean Section Using the Amsterdam Preoperative Anxiety and Information Scale: A Randomized Controlled Study

Dr Sarvesh B[1], Dr Abhishek Yesudhas[2], Dr U Anand Krishnan[3]

[1]Professor, Department of Anaesthesiology, Adichunchanagiri Institute of Medical Science, Adichunchanagiri University, Nagamangala Taluk, Mandya District, Karnataka, India.

[2]3rd year Junior Resident, Department of Anaesthesiology, Adichunchanagiri Institute of Medical Science, Adichunchanagiri University, Nagamangala Taluk, Mandya District, Karnataka, India.

[3]3rd year Junior Resident, Department of Anaesthesiology, Adichunchanagiri Institute of Medical Science, Adichunchanagiri University, Nagamangala Taluk, Mandya District, Karnataka, India.

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ABSTRACT

Introduction: Preoperative anxiety is common among patients undergoing surgery and is particularly significant in parturient scheduled for elective lower segment cesarean section (LSCS). Elevated anxiety is associated with adverse perioperative outcomes. Non-pharmacological interventions such as music therapy have gained attention as safe and effective alternatives to reduce anxiety without drug-related side effects. The present study aimed to evaluate the effect of music therapy on preoperative anxiety in patients undergoing elective LSCS using the Amsterdam Preoperative Anxiety and Information Scale (APAIS).

Materials and Methods: This prospective randomized controlled study was conducted in the Department of Anaesthesiology at Adichunchanagiri Institute of Medical Sciences. A total of 100 parturient undergoing elective LSCS under spinal anaesthesia were randomly allocated into two groups: music group (n=50) and control group (n=50). The music group received 20 minutes of calming instrumental music prior to surgery, while the control group received standard care. Anxiety was assessed using the Amsterdam Preoperative Anxiety and Information Scale (APAIS) before and after intervention. Heart rate and blood pressure were also recorded.

Results: Baseline characteristics and APAIS scores were comparable between groups ($p > 0.05$). Post-intervention, APAIS scores were significantly lower in the music group compared to controls (8.2 ± 1.9 vs 12.1 ± 2.2, $p < 0.001$), with a greater mean reduction (5.4 ± 1.8 vs 1.3 ± 1.2, $p < 0.001$). Significant reductions in heart rate and blood pressure were also observed in the music group ($p < 0.01$). The proportion of patients with high anxiety (APAIS ≥ 11) was significantly lower in the music group (24% vs 68%, $p < 0.001$).

Conclusion: Music therapy significantly reduces preoperative anxiety and improves hemodynamic stability in patients undergoing elective LSCS. It is a simple, safe, and cost-effective intervention that can be incorporated into routine preoperative care.

Keywords: Music therapy; Preoperative anxiety; Cesarean section; APAIS; Non-pharmacological intervention

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INTRODUCTION

Preoperative anxiety is a common and clinically significant concern among patients undergoing surgical procedures, with reported prevalence ranging from 40% to 70% [1]. It is particularly pronounced in obstetric populations, where concerns regarding maternal safety, fetal well-being, and the surgical outcome contribute to heightened anxiety levels [2]. Elevated preoperative anxiety has been associated with adverse perioperative outcomes, including increased anaesthetic requirements,

hemodynamic instability, prolonged recovery, and reduced patient satisfaction [3].

Accurate assessment of preoperative anxiety is essential for timely intervention [4]. The Amsterdam Preoperative Anxiety and Information Scale (APAIS) is a validated and widely used tool that evaluates anxiety related to anaesthesia and surgery, along with the patient's need for information [5]. It offers a simple, reliable, and clinically applicable method for quantifying anxiety levels in the preoperative setting [6].

Pharmacological agents such as benzodiazepines are commonly employed to reduce preoperative anxiety; however, their use may be associated with undesirable effects such as excessive sedation, respiratory depression, and potential neonatal implications in obstetric patients [7,8]. Consequently, there is growing interest in non-pharmacological interventions that are safe, cost-effective, and free from drug-related adverse effects [9].

Music therapy has emerged as a promising non-invasive intervention that can modulate autonomic responses, reduce stress, and provide distraction, thereby alleviating anxiety [10,11]. Several studies have demonstrated its effectiveness in reducing preoperative anxiety and improving perioperative outcomes [12,13]. However, limited data are available regarding its role in parturients undergoing elective lower segment cesarean section. Therefore, the present study aimed to evaluate the effect of music therapy on preoperative anxiety in patients undergoing elective LSCS using the Amsterdam Preoperative Anxiety and Information Scale.

MATERIALS AND METHODS

This prospective randomized controlled study was conducted in the Department of Anaesthesiology at Adichunchanagiri Institute of Medical Sciences over a period of two months, after obtaining approval from the Institutional Ethics Committee. A total of 100 parturient scheduled for elective lower segment cesarean section (LSCS) under spinal anaesthesia were enrolled. Written informed consent was obtained from all participants prior to inclusion in the study.

Participants aged 18–40 years with ASA physical status II undergoing elective LSCS were included. Patients undergoing emergency cesarean section, those with a history of psychiatric illness, hearing impairment, or those receiving anxiolytic medications were excluded. Patients who declined to participate were also excluded from the study.

Eligible participants were randomly allocated into two groups using a sealed opaque envelope technique. Group M (music group, n=50) received 20 minutes of calming instrumental music through headphones prior to surgery, while Group C (control group, n=50) received standard preoperative care without music intervention. Baseline anxiety was assessed using the Amsterdam Preoperative Anxiety and Information Scale (APAIS) before intervention and reassessed after intervention prior to transfer to the operating theatre. Heart rate and blood pressure were recorded at baseline and after the intervention.

The primary outcome was the change in APAIS score between the two groups. Secondary outcomes included changes in heart rate, systolic and diastolic blood pressure, and the proportion of patients with high anxiety (APAIS ≥11). Continuous variables were expressed as mean ± standard deviation and compared using paired and independent t-tests, while categorical variables were expressed as number (percentage) and analyzed using the chi-square test. A p-value of <0.05 was considered statistically significant.

RESULTS

Baseline characteristics were comparable between the two groups. The mean age in the music group was 26.8 ± 3.4 years compared to 27.2 ± 3.1 years in the control group. Similarly, the mean gestational age was 38.4 ± 1.2 weeks in the music group and 38.6 ± 1.1 weeks in the control group. No statistically significant differences were observed ($p > 0.05$), indicating adequate baseline homogeneity (Table 1).

Table 1: Baseline Characteristics

Variable	Music Group (n=50)	Control Group (n=50)	p-value
Age (years)	26.8 ± 3.4	27.2 ± 3.1	0.58
Gestational age (weeks)	38.4 ± 1.2	38.6 ± 1.1	0.42

APAIS scores were similar at baseline between the music and control groups (13.6 ± 2.1 vs 13.4 ± 2.3, $p = 0.71$). Following intervention, the music group demonstrated a marked reduction in anxiety scores (8.2 ± 1.9), whereas the control group showed only a modest decrease (12.1 ± 2.2). The mean reduction in APAIS score was significantly greater in the music group compared to the control group (5.4 ± 1.8 vs 1.3 ± 1.2, $p < 0.001$) (Table 2).

Table 2: APAIS Scores

Parameter	Music Group	Control Group	p-value
Baseline	13.6 ± 2.1	13.4 ± 2.3	0.71
Post-intervention	8.2 ± 1.9	12.1 ± 2.2	<0.001
Mean reduction	5.4 ± 1.8	1.3 ± 1.2	<0.001

Hemodynamic parameters were comparable at baseline between the two groups. Post-intervention, the music group showed a significant reduction in heart rate compared to the control group (82.1 ± 5.9 vs 89.8 ± 6.5, p < 0.001). Similarly, systolic blood pressure decreased significantly in the music group (118.2 ± 7.5 mmHg) compared to the control group (123.6 ± 8.1 mmHg, p = 0.002). Diastolic blood pressure also showed a significant reduction in the music group (75.6 ± 5.2 vs 80.1 ± 5.6, p < 0.001), reflecting improved autonomic stability (Table 3).

Table 3: Hemodynamic Parameters

Parameter	Music Group	Control Group	p-value
Heart Rate (beats/min)			
Baseline	92.4 ± 6.8	91.7 ± 7.1	0.64
Post-intervention	82.1 ± 5.9	89.8 ± 6.5	<0.001
Systolic BP (mmHg)			
Baseline	126.5 ± 8.2	125.8 ± 7.9	0.68
Post-intervention	118.2 ± 7.5	123.6 ± 8.1	0.002
Diastolic BP (mmHg)			
Baseline	82.3 ± 5.6	81.9 ± 5.8	0.74
Post-intervention	75.6 ± 5.2	80.1 ± 5.6	<0.001

The proportion of patients with high anxiety (APAIS ≥11) was significantly lower in the music group compared to the control group (12 [24%] vs 34 [68%], p < 0.001). Conversely, a higher proportion of patients in the music group had low anxiety levels (38 [76%] vs 16 [32%]), demonstrating the effectiveness of music therapy in reducing clinically significant preoperative anxiety (Table 4).

Table 4: Anxiety Category

Category	Music Group (n=50)	Control Group (n=50)	p-value
High anxiety (≥11)	12 (24%)	34 (68%)	<0.001
Low anxiety (<11)	38 (76%)	16 (32%)	

DISCUSSION

The present study demonstrates that music therapy significantly reduces preoperative anxiety in parturient undergoing elective LSCS, as evidenced by a marked reduction in APAIS scores in the intervention group compared to controls. These findings are consistent with multiple randomized controlled trials and meta-analyses, which have shown that music serves as an effective non-pharmacological intervention for alleviating preoperative anxiety. A recent randomized study by Ding et al. reported that structured music intervention significantly reduced anxiety levels in patients undergoing gynaecological surgery compared to standard care [14]. Similarly, earlier work by Wang SM et al. demonstrated

that music can effectively decrease preoperative anxiety in surgical patients, supporting the robustness of the present findings [15].

The significant reduction in anxiety scores observed in this study is further supported by systematic reviews and meta-analyses. A recent meta-analysis reported a substantial decrease in preoperative anxiety among patients exposed to music, with a weighted mean difference of −6.78, indicating a clinically meaningful effect [16]. These findings align closely with the magnitude of reduction observed in the present study, reinforcing the role of music as a reliable anxiolytic adjunct in perioperative care.

In addition to reducing subjective anxiety, the present study demonstrated significant improvements in physiological parameters, including heart rate and blood pressure, indicating attenuation of the sympathetic stress response. This is in agreement with previous studies that have shown music to modulate autonomic function and reduce perioperative stress markers. For instance, studies in cesarean section patients have reported reductions in heart rate and diastolic blood pressure following music intervention [17]. Furthermore, broader perioperative research indicates that music therapy contributes to improved physiological stability and reduced stress hormone levels [18]. However, some studies have reported inconsistent effects on hemodynamic parameters, suggesting that the extent of physiological benefit may vary depending on study design and patient population [15].

The proportion of patients with clinically significant anxiety (APAIS ≥11) was markedly lower in the music group in the present study, highlighting its clinical relevance beyond statistical significance. This finding is particularly important in obstetric anesthesia, where minimizing anxiety can improve maternal experience and potentially influence perioperative outcomes. Previous literature in cesarean delivery has similarly demonstrated that music reduces anxiety and enhances patient comfort during surgical procedures [19]. Overall, the present study adds to the growing body of evidence supporting music therapy as a simple, safe, and cost-effective intervention that can be easily integrated into routine preoperative care.

LIMITATIONS

The present study has certain limitations. First, it was conducted at a single tertiary care centre with a relatively small sample size, which may limit the generalizability of the findings. Second, the study included only elective LSCS patients with ASA II status, and therefore the results may not be applicable to high-risk pregnancies or emergency cesarean sections. Third, anxiety assessment was limited to the immediate preoperative period without evaluation of postoperative anxiety, pain, or maternal satisfaction. Additionally, individual music preferences were not considered, which could have influenced the psychological response to the intervention. Further multicentric studies with larger sample sizes and long-term follow-up are required to validate these findings.

CONCLUSION

Music therapy is an effective, safe, and non-pharmacological intervention for reducing preoperative anxiety in patients undergoing elective lower segment cesarean section. It significantly decreases APAIS scores, stabilizes hemodynamic parameters, and reduces the proportion of patients with clinically significant anxiety. Given its simplicity, cost-effectiveness, and absence of adverse effects, music therapy can be readily incorporated into routine preoperative care to improve patient comfort and overall perioperative experience.

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