Research Article

Effects of music on patients undergoing caesarean section under spinal anaesthesia

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Abstract

Introduction: Most caesarean sections are performed under epidural or spinal block and women undergoing caesarean section often experience anxiety in anticipation of the event to which one may be unfamiliar, uncomfortable or have undesirable results. **Methods:** This randomized controlled clinical trial was conducted for a period of one year. 100 pregnant with American Society of Anesthesiologists (ASA) physical status I–II scheduled to undergo cesarean section surgery under spinal anaesthesia were taken up for the study and were randomly divided into two equal groups. The objective of the study was to evaluate the effect of music on self-reported anxiety and hemodynamic parameters in the intraoperative phase in patients who underwent caesarean section under spinal anaesthesia. Patients of study group were subjected to listen preoperatively self chosen music with the help of headphone with the volume label as acceptable by the patient. Music listening started on completion of successful spinal anaesthetic procedure and lasted till the end of the surgery. The Visual Analogue Scale (VAS) was explained in detail to the patients and was used to measure the preoperative & postoperative anxiety, and maternal satisfaction score (MSS), and haemodynamic parameters was recorded. **Results:** There was no statistically significant change in the SpO2 (P=.782), systolic (P=.405) and diastolic blood pressure (P=.513) but there was significant change in the respiratory rate (P=.004) and pulse rate (P=.017) on completion of the surgery in the music group. A statistically significant difference was also recorded in the VAS for anxiety score (VASA), P=.000 and MSS (P=.000) in the postoperative period in the music group. **Conclusion:** Music therapy is an example of a non-pharmacological aid that can be used on patients undergoing surgical under spinal anaesthesia, empowering the patient to develop own ability to gain control over negative effects of the surgical stress.
Key words: Caesarean Section, Headphone, Music, Spinal Anaesthesia.

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INTRODUCTION

Most caesarean sections are performed under epidural or spinal block and women undergoing caesarean section often experience anxiety in anticipation of the event to which one may be unfamiliar, uncomfortable or have undesirable results. This anxiety can increase the risk of psychological and physiological complications and delays in postoperative recovery.[1] Negative physiological manifestations are increased blood pressure and heart rate, leading to slower wound healing, diminished immune response, and increased risk of infection. Caesarean section has also been associated with emotional difficulties for the woman, including postpartum depression and negative feelings about the experience of childbirth.[2]For attenuation of stress and anxiety use of pharmacologic methods like opioids and benzodiazepines may impair the recovery of patients for their sedative and emetic effects. The use of variety of non-pharmacological interventions, especially in caesarean section where the immediate close contact of mother and neonate is desired, would improve the recovery of patients.Since ancient time it has been observed that music plays a role in different situations of

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our day to day life. Music is found to enhance well being and reduce stress by exerting direct physiologic effects through the autonomic nervous system. Some studies have suggested that exposure to calming music can alleviate perioperative pain and anxiety[3,4], and may improve the hemodynamic status of patients.[5,6] This randomized controlled clinical trial was conducted to evaluate the effects of music on self-reported anxiety and hemodynamic parameters in the intraoperative phase in patients who underwent caesarean section under spinal anaesthesia.

METHODS

This was a randomized, controlled study conducted in College of Medicine & JNM Hospital, Kalyani (West Bengal) from April 2013 to March 2014. 100 pregnant women with American Society of Anesthesiologists (ASA) physical status I–II scheduled to undergo caesarean section surgery under spinal anaesthesia were taken up for the study. Our objective was to study the effect of music on self-reported anxiety and hemodynamic parameters in the intraoperative phase in patients who underwent caesarean section under spinal anaesthesia.

Exclusion criteria included patients with any hearing impairment, chronic pain problems, any known psychiatric or memory disorder, and patient who refused to listen music during caesarean section. Subjects were randomly assigned to either Music Group (A) or Silence Group (B). Group-A received standard care along with music while Group B received only standard care. The study was approved by the ethics committee of the hospital. Patients of Group-A were subjected to listen preoperatively self chosen music with the help of headphone with the volume label as acceptable by the patient. Music listening started on completion of successful spinal anaesthetic procedure and lasted till the end of the surgery. The Visual Analogue Scale for Anxiety (VASA) was explained in detail to the patients. Preoperative anxiety was recorded using VASA, which consists of a 10 cm horizontal line with the descriptors '0-no anxiety' at the left extent and '10-worst possible anxiety' at the right extent (Gift 1989). Intraoperative haemodynamic parameters were monitored and recorded which included Pulse, Haemoglobin oxygen saturation (SpO_2); Respiration rate (per minute); Systolic and Diastolic blood pressure (mmHg). Intraoperative anxiety using VASA and Maternal Satisfaction Score (MSS) regarding perioperative experience was recorded using Visual Analogue Scale (VAS) which consists of a 10 cm horizontal line with descriptors '0-worst experience' at the left extent and '10-Highly satisfied' was recorded in the immediate postoperative period.Standard routine monitoring was done and haemodynamic parameters for the study were collected at three points: (I): In the Pre operation room prior to anaesthesia and caesarean section; (II): On completion of the process of spinal anaesthesia; (III): After delivery of the baby in the intra-operation period and (IV): On completion of surgery. Anxiety using VAS was recorded in two points: First (A1): Preoperative period and second (A2) in the post operative recovery room along with the MSS. Randomization was done by allocating the patients in the groups on alternate basis. The observers were blind as: (i) one recorded the VASA and MSS; (ii) one applied headphone to all patient but played the music only to the Music group (Group-A) and (iii) one did the analysis of the data using MS Excel and SPSS 22.0 software. The differences of means of different variables were tested with independent t test. All tests applied were two-tailed. P value less than .05 was considered to be significant.

RESULTS

Table 1: Comparison of baseline characteristics and duration of surgery in two groups

Variable	Music group(n=50)	Silence group (n=50)	p value
Age (years) Mean (Standard Deviation)	24.68 (4.74)	24.84 (3.99)	.851
Weight (Kg) Mean (Standard Deviation)	56.62 (6.97)	57.58 (6.39)	.474
Height (cm) Mean (Standard Deviation)	157.22 (7.96)	161.42 (7.47)	.008
Surgery(minutes) Mean (Standard Deviation)	31.20 (10.01)	28.64 (7.33)	.148

Patients in both the groups were comparable in terms of age, weight and duration of surgery, the height of patients in the silence group was significantly more.

Table 2: Comparison of SpO2, respiration rate, pulse rate, systolic and diastolic blood pressure in two groups

Variable	Music group(n=50)	Silence group (n=50)	p value
SpO2			
(I)Pre- operative	99.76 (.06)	99.68 (.74)	.543
(II)On completion of SA	99.82 (.44)	99.84 (.37)	.806
(III) After delivery of baby	99.80 (.49)	99.84 (.37)	.648
(IV) On completion of surgery	99.86 (.35)	99.84 (.37)	.782
Respiratory rate			
(I)Pre- operative	16.08 (.93)	16.12 (.69)	.806
(II)On completion of SA	16.16 (.51)	16.18 (.77)	.879
(III)After delivery of baby	16.12 (.59)	16.52 (.74)	.003
(IV)On completion of surgery	16.16 (.47)	16.58 (.88)	.004
Pulse rate			
(I)Pre- operative	89.72 (14.22)	90.62 (14.80)	.757
(II)On completion of SA	86.14 (16.11)	87.86 (17.12)	.606
(III)After delivery of baby	88.88 (9.91)	91.98 (9.41)	.112
(IV)On completion of surgery	85.10 (14.82)	92.28 (14.77)	.017
Systolic blood pressure			
(I)Pre- operative	132.16 (10.44)	130.90 (8.95)	.519
(II)On completion of SA	126.52 (9.25)	126.24 (8.78)	.877
(III)After delivery of baby	117.88 (11.68)	120.16 (12.53)	.349
(IV)On completion of surgery	109.76 (10.83)	111.66 (11.89)	.405
Diastolic blood pressure			
(I)Pre- operative	89.52 (13.89)	89.00 (4.68)	.802
(II)On completion of SA	86.86 (7.07)	85.64 (5.79)	.348
(III)After delivery of baby	77.02 (8.36)	79.96 (12.94)	.180
(IV)On completion of surgery	69.36 (10.99)	67.96 (10.33)	.513

n=number of patients

The clinical outcomes of SpO2, respiration rate, pulse rate, systolic and diastolic blood pressure were presented as means and standard deviations (SD) for both groups and at majority interval of time there was no significant change with exception of few like significant change in the respiratory rate was noted in time III (P=.003) and IV (P=.004), pulse rate in time IV (P=.017) only (Table 2).

Table 3: Comparison of VASA, MSS in two groups

Data	Music group(n=50)	Silence group (n=50)	p value
VASA: A1 Mean (Standard Deviation)	5.96 (2.57)	5.90 (2.57)	.907
VASA:A2 Mean (Standard Deviation)	.28 (.45)	4.96 (1.32)	.000
MSS Mean (Standard Deviation)	9.62 (.64)	6.00 (1.19)	.000

n=number of patients

VASA score in the preoperative (A1) and postoperative period (A2) and MSS in the postoperative period (A2) were presented as mean and standard deviation (SD) for both groups (Table 3).

DISCUSSION

With the availability of different music, we see that it makes its presence in different emotional and psychological situations. It is evident that one can enjoy different music depending upon his/her own mental situation at different intervals of time. In our study we found that music is effective in reducing anxiety with increased maternal satisfaction in regard to the surgical birth process. Studies evaluating the effects of music interventions in surgical patients have examined music provided at different times (preoperatively, intraoperatively, and/or postoperatively), with different patient populations, and using different types of musical selections. There are several positive reports regarding the effects of music on perioperative anxiety levels.[3,4] Chang *et al* in their study on music used SpO2,

respiration rate, pulse rate, systolic and diastolic blood pressure, and VASAscore as primary outcomes and birth satisfaction as a secondary outcome with no statistically significant differences between the intervention and control groups for most outcomes.[5] However, like our study there were statistically significant differences between the intervention and control groups for pulse rates and MSS. Some negative reports have also been published in this regard.[8,9] Anxiety was not influenced by music in the study by Ebneshahidi Aand Mohseni M possibly because the levels of estimated anxiety were low and the preoperative levels of anxiety was not measured.[10]Music may be useful during caesarean section under regional anaesthesia in terms of improving outcomes for the mother and baby. A few studies showed the efficacy of music postoperatively on reducing blood pressure and heart rate.[6,7] But these studies did not adjust hemodynamic parameters for the intensity of pain and anxiety; thus, a desirable direct effect on blood pressure and heart rate could not be determined by their results.Instudies that reported significant effects of music on blood pressure, patients were allowed to choose the type of music[1,11,12,13,14,15,16],and in 4 of these studies with significant effects on blood pressure, the music intervention was initiated preoperatively.[11,13,14,15] These findings suggest that music interventions may be most effective in reducing blood pressure if patients are allowed to choose the type of music and if the music intervention is initiated preoperatively. In this study, we allowed participants to listen to their favorite music. We expected that self chosen music might help our patients feel at home in the strange environment of operation theater and facilitate distraction from undesired experiences such as pain and anxiety. In agreement with our results, some previous studies demonstrated the efficacy of patient-selected music in the perioperative period.[17,18,19], even with comparable effects with standard sedative music.[20]However, it has been suggested by Siedliecki SL *et al* that no particular style of music is more effective than another at increasing relaxation; rather, the most important factor is how much the patient likes the music.[21]Broscious SK *et al* found that music therapy might be more effective when patients are capable of focusing on music intervention. [22]It is important to note that age, culture, socioeconomic status, and religion affect the way people respond to pain and music.[23,24]Music can act as a distracting agent to refocus the attention from negative stimuli causing the stress, to something that is pleasant; it occupies one's mind with something familiar, soothing and preferred, allowing people to escape to "their own world". The patient can focus on his or her awareness of the music, as an aid to relaxation.[1] Additional research is needed to more specifically examine the mechanisms by which music produces beneficial effects on anxiety. Our study demonstrated that playing music during surgery under spinal anaesthesia would be beneficial for patients.

CONCLUSION

Music therapy is an example of a non-pharmacological aid that can be used on patients undergoing surgical under spinal anaesthesia, empowering the patient to develop own ability to gain control over negative effects of the surgical stress. This intervention is a simple, inexpensive and non-invasive method that can be usedadvantageously during intra and postoperative care.

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