

EFFECT OF MUSIC AS NON PHARMACOLOGICAL INTERVENTION DURING LABOUR ON MATERNAL AND PERINATAL OUTCOME

Obstetrics & Gynaecology

Diti Anand*

Senior Resident, Dept. of Obstetrics and Gynaecology, GMCH Chhatrapati Sambhajanagar, Chhatrapati Sambhajanagar, Maharashtra- 431001, India.
*Corresponding Author

Shrinivas N. Gadappa

Professor and Head of department, Department of Obstetrics & Gynecology, GMCH Chhatrapati Sambhajanagar, Chhatrapati Sambhajanagar, Maharashtra- 431001, India

Prashant E. Bhingare

Associate professor, Department of Obstetrics & Gynecology, GMCH Chhatrapati Sambhajanagar, Chhatrapati Sambhajanagar, Maharashtra- 431001, India.

ABSTRACT

Purpose Of The Study Childbirth, although being the most beautiful experience in a woman's life, is associated with pain, fear and anxiety which can have negative effects on labor outcome. Studies have proven that music has effect on reducing pain, anxiety and reducing labour duration. Aiming at RMC and providing positive birth experience to a mother, we incorporated soothing music during labour as non pharmacological method and compared maternal and newborn outcomes with control group. **Methods** This was a quasi-experimental study conducted in the Department of OBGY, GMCH, Chhatrapati Sambhajanagar comprising 100 low-risk women satisfying inclusion criteria. First 50 women were allotted to experimental group and next 50 to control group who received soothing music during labour or no music during labour respectively. The impact of this intervention was evaluated by duration of labour, mode of delivery, need of oxytocin augmentation and admission to neonatal intensive care units, and data was analysed by an appropriate statistical test. **Results** The duration of labour, need of oxytocin augmentation and rate of caesarean section was significantly lower in the intervention group than in the control group. The intervention group experienced significant reduction in anxiety and pain in first stage of labour. The rate of NICU admission was lower in the intervention group, however statistically comparable to control group. **Conclusion** The findings of this study indicate that listening to music during labor improves maternal and newborn outcomes without any harm. As this is a harmless treatment that is simple to implement, we recommend its routine use during labor in private as well as the public sector.

KEYWORDS

Respectful maternity care Caesarean section rate NICU admission Music

INTRODUCTION

Labor is a unique experience associated with childbirth which is normally a meaningful and welcomed event in the life of a woman. (1) It is one of the most beautiful episodes in a mother's life, associated with joy, happiness, and celebration. However, a delivery is also related to negative emotions: fear, anxiety, low sense of security, and the expectation of pain [2]. Women often mention, that because of their anxiety they would prefer a caesarean section rather than a natural delivery [3]. It has been seen that the anxiety occurring at the last trimester of pregnancy and labour, and especially acute state anxiety have negative effects on the duration of the phases of labour(4). Labour pain as well as being unpleasant for the mother, can have deleterious effects on the foetus (5). There are biochemical and neurophysiological evidences that maternal pain during labor results in deleterious consequences for the parturient and fetus (6). Diverse interventions such as pharmacologic methods, acupressure, biofeedback, aromatherapy, hypnosis, relaxation techniques, breathing technique, massage, and warm shower have been used to relieve labor pain [7, 8, 9, 10] Pharmacological pain management methods (PPM) have been associated with various side effects and risks despite their effectiveness [11]. Over the past few decades, a growing interest has been expressed in revisiting non-pharmacological pain management techniques (NPPM) to reduce labor pain [12, 13]. This shift is driven by a confluence of factors, including increasing evidence of pharmacological interventions' side effects and risks. Additionally, there has been a broader societal shift towards more patient-centered and holistic healthcare, emphasizing personal autonomy, shared decision-making, and natural and complementary therapies [14]. NPPMs have demonstrated encouraging outcomes in diminishing pain intensity and enhancing satisfaction and are commonly regarded as safe, with minimal adverse effects compared to pharmacological interventions [15, 16, 17]. Music therapy as non-pharmacologic intervention has been studied and is believed to restore, maintain, and improve emotional, physiological and psychological well being. The application of music in pain management has gained popularity in medicine only in the last two decades only [18] particularly in the treatment of psychological variables during pregnancy, and to facilitate the birthing process [19]. Listening to music causes distraction and diverts feelings of anxiety, and activates the release of endorphins-the body's natural pain killers [20]. Music-therapy during labor increases tolerance to pain, decrease anxiety,

increases parturition and uterine activity, and shorten labor duration (21). International studies have shown that soothing music is effective in reducing distress, pain and for inducing relaxation and reducing anxiety of the women during the latent phase of labor [22-29]. Previous studies also cited that listening to music provided greater relaxation, assisted concentration, and shortened labor [26, 27]. Use of music as relaxation techniques has been recommended by WHO in labour care guide (30). Also, under LAQSHYA Labour room Quality improvement initiative 2017, it is component of various interventions in care environment (31). Goodman et al. describe that a positive childbirth experience increases first-time mothers' self-confidence and leads to positive expectations for future childbirth experiences. Negative experiences can lead to women choosing caesarean section at the next delivery or abortion as a future desire [32] As we practice RMC at our institute and follow LAQSHYA guidelines, and soothing music being one of its components, we wish to study on it.

Objective(s)

To compare the maternal and fetal outcome with women exposed and not exposed to soothing music during labour under

1. Duration of labour
2. Need of oxytocin augmentation
3. Mode of delivery
4. NICU admission

MATERIAL AND METHOD(S)

Inclusion Criteria Primigravida or multigravida at 37-40 weeks of gestational age with singleton pregnancy with cephalic presentation with no obstetric complication, no medical disorder, spontaneous labour with cervical dilatation 4-7cm, delivered at our institute. Women who are willing to participate in this study.

Exclusion Criteria Women with multiple gestation, non- cephalic presentation, medical disorders, requiring ICU admission, women with previous LSCS, < 37 weeks of gestational age, IUFD. Women who do not want to participate in study.

Intervention After obtaining the permission from the institution ethics committee this study was conducted in the Dept. of Obstetrics and gynecology. A detailed history of woman was taken regarding name, age, socio economic status, address, occupation, previous medical

disorders. After applying the inclusion and exclusion criteria women were selected for this study. First 50 women were allotted to experimental group and next 50 to control group who received soothing music during labour or no music during labour respectively. The intervention took place in the labour room. The non-music group were provided with the usual standard routine care (vital signs monitoring & fetal heart monitoring) while the music group were provided with the usual standard routine of care and were also exposed to music therapy during labour. Both groups did not receive analgesics or other non-pharmacologic treatments during the course of the investigation. Study group included the females exposed to soothing music in labour and control group included females without any exposure to soothing music during labour. As instrumental music is more effective at decreasing psychological stress than lyrical music (34), a series of random melodies consisting of instrumental music of trending soothing Bollywood songs on youtube was played on labor room music system for women in labour and those were counted in study group after applying inclusion and exclusion criteria. Similarly, control group was studied when no music was played.

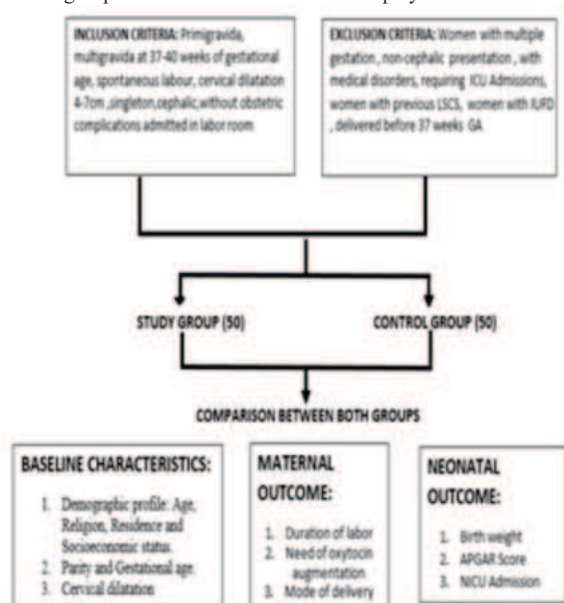


Fig. 1 The effect of music during labour on the maternal and newborn outcome at a tertiary care centre

Evaluation of effectiveness of music therapy in terms of pain and anxiety in study group mothers during the first stage of labour was carried out for those who delivered vaginally. Anxiety was tested by using state scale of Speilberger's State Trait Anxiety Inventory which has total 20 questions (maximum score: 80). Anxiety was recorded twice i.e. at entry point in study and at end of 1st stage of labour. Similarly, pain was tested by numerical pain intensity scale having scale of 1 to 10.

Data were analysed by using SPSS software version 15 and a p -value < 0.05 was considered significant. For qualitative data, the Chi-square test was used and for quantitative data, a t -test was used.

Cases were interviewed regarding their labour experience at the time of discharge.

Observation(s):

Both groups were comparable with respect to age, religion, residence, parity, gestational age and socioeconomic status (Table 1). Both groups were also comparable with respect to cervical dilatation at inclusion in study.

Table 1 Baseline Characteristics Of Study Population

Baseline characteristics	Intervention group (n=50)	Control group (n=50)	Statistical analysis
Age	23.76 ± 3.15	23.58 ± 3.32	$p = 0.7$
Religion	Hindu	50%	$p = 0.83$
	Muslim	48%	

	Jain	2%	0	
Residence	Rural	52%	64%	$p = 0.085$
	Urban	48%	36%	
Parity	Nullipara	60%	56%	$p = 0.717$
	≥Primipara	40%	64%	
Mean gestational age		39.1	39.2	$p = 0.5$
Socioeconomic status*	Class II (upper middle)	2 %	10%	$p = 0.217$
	Class III (lower middle)	24%	18%	
	Class IV (upper lower)	64%	68%	
	Class V (lower)	10%	4%	

*Modified Kuppaswamy's Scale

The duration of labour and need of oxytocin augmentation had significant difference between intervention group and the control group. The rate of caesarean section was significantly reduced in the intervention group (18%) than in the control group (30%) (Table 2.A).

Table 2 Comparison Of Clinical Outcomes

A. Maternal outcome				
Characteristics		Intervention group	Control group	Statistical analysis
Mean duration of labor		137 minutes ± 75.81 minutes (n=41)	244.91 minutes ± 124.13 minutes (n=35)	$p < 0.0001$
Need of oxytocin augmentation	Yes	04	16	$p =$
	No	37	19	0.000388
Mode of delivery (n=50)	Normal delivery	82%	70%	$p = 0.04$
	Caesarean section (LSCS)	18%	30%	
	Operative vaginal delivery (OVD)	0	0	
B. Neonatal Outcome				
Characteristics		Intervention group (n=50)	Control group (n=50)	Statistical analysis
Mean birth weight		2820.8g ± 286.68g	2791.88g ± 333.02g	$p = 0.6418$
NICU admission	Yes	02	07	$p = 0.08061$
	No	48	43	
C. Comparison of pretest and post-test anxiety and pain score				
Characteristics		Mean	Standard deviation	Statistical analysis
Anxiety score	Pre-test	57.21	3.18	$p < 0.0001$
	Post-test	48.09	4.18	
Pain score	Pre-test	7.8	0.77	$p < 0.0001$
	Post-test	6.75	0.65	

There were total 9 NICU admissions for asphyxia with 5 min APGAR score <7. All were given discharge within 48 hours of admission. The rate of NICU admission although lower in study group (4%) than the control group (14%) but was statistically comparable. Baby weight at birth was comparable in both groups. (Table 2.B.).

Table 2.C. indicates that the anxiety level and the pain level of the study group mother was significantly reduced in the posttest. Thus it can be inferred that the music therapy was effective in reducing the anxiety level and the pain level of the mothers in first stage of labour.

Out of 50 women who received music therapy, around 86% of women were fully satisfied with the labour room environment due to presence of music. One of the multipara woman mentioned while being discharged, "my experience in this pregnancy was better than previous one. I felt homely environment with music being played."

DISCUSSION

A safe childbirth process requires appropriate management of pain and discomfort during labour and childbirth. Relaxation techniques help to keep the mother's body tension free to avoid excessive pain and discomfort. As an age old relaxation technique, proper music is having tremendous positive impact on mind. Music therapy is a non

pharmacological intervention which has been used widely to promote comfort as well as relaxation. The present study investigates the effectiveness of music therapy during active labour and its impact of obstetric outcomes.

This clinical trial showed that in women with singleton pregnancies at term, listening to music resulted in a statistically significant reduction in duration of labour than no music. Music during labor and delivery was also associated with a decreased need of oxytocin augmentation and increased rate of spontaneous vaginal delivery which is consistent with the study by Zhu [41] using music therapy to achieve decreases of duration of labor and an increased probability of spontaneous delivery. Music interventions results in a reduction of pain and stress during childbirth, as supported by various studies. (34-36) Music-therapy during labor increases tolerance to pain, decrease anxiety, increases parturition and uterine activity, and shorten labor duration (21).

Music decreases pain and unpleasant feelings probably by activating the network of cortical and subcortical regions of brain especially dopaminergic system in brain. Previous studies indicate that music has analgesic (painkiller) effects and is effective in reducing stress and banishing negative thoughts.

It has been seen that the anxiety occurring at the last trimester of pregnancy and labour, and especially acute state anxiety have negative effects on the duration of the phases of labour (4). A systematic review by Santiv  ez-Acosta et al. [42], which assessed the effects of music on pain and anxiety management in primiparous women during labour and found that music alleviated pain and anxiety throughout the latent and active phases of labour.

Studies have indicated that listening to music increases plasma levels of oxytocin hormone (37). Music probably increases the production and discretion level of oxytocin hormone, by raising the level of dopamine in near ventricular nucleus and supraoptic, which finally shorten the labor time (21). This explains our study findings of decreased duration of labour and need of external oxytocin. Oxytocin also reduces the pain by stimulating the opioidergic systems (38). Khodakarami et al (39) have done a research in one of the hospitals in Tehran which proves that music and messages significantly decreases the pain of delivery and shorten its time.

We observed a significantly higher rate of Spontaneous Vaginal Delivery among patients listening to music during labor as compared to those not listening to music. Similar findings were noted by Pasternak Y et al (40).

Limitations of our trial includes the single center nature of the trial, and the small sample size which raises the question of the external generalizability of the findings. Also, although the instrumental music contained trending and most liked songs, it was generalized for everyone and women were not given choice to choose the music of their taste. Thirdly, the music was played on speaker and music system, and women did not have personal earphones. Use of personal earphones could have better delivered music to cases and would have minimalised effect external noise.

CONCLUSION

The findings of this study indicate that listening to music during labor improves maternal and newborn outcomes without any harm. As this is a harmless treatment that is simple to implement, we recommend its routine use during labor in private as well as the public sector.

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