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Effect Of Music On Breast Milk Secretion Among Mothers Of Low Birth Weight Babies Admitted In Selected NICU's

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Abstract

Study was conducted to assess the effect of music on breast milk secretion among mothers of low birth weight babies admitted in selected NICU's with the objectives to assess the volume of expressed breast in experimental and control group after intervention and to determine the effect of music on volume of expressed breast milk.A Quasi experimental non-equivalent control group post-test design only was selected. Total 40 samples were selected by non-probability purposive sampling method. Assigned 20 samples each in experimental and control group. Mothers who are known case of hearing deficiency and who were identified with hearing problem during preliminary assessment were excluded from the study. In experimental group soft music was given for 30 minutes through headphones once a day in morning and milk was expressed at end of 10 minutes continuing to listen to music for 4 days. In control group breast milk was expressed without intervention for 4 days. Observation checklist was prepared to record the volume of expressed breast milk (in ml). Post assessment was done on day 4. The findings revealed that, on day 1 mean volume of expressed breast milk was 8.95 ml in experimental group which was more than control group (6.35ml). On day 4 in experimental group the mean volume of expressed breast milk was 33.25ml (SD= 2.69) which was more than in control group the mean is 24.20 (SD= 2.12). The calculated t value was 11.82 with p value 0.000 which is less than 0.05. Findings show that there was more increase in volume of expressed breast milk in experimental group compared to control group.

Keywords: Music,expressed breast milk, mothers of low birth weight babies.

Introduction:

The rate of prematurity and low birth weight babies is increasing day by day, it is more recorded in developing and underdeveloped countries. Out of that India remains in one of the country recorded

with high prevalence. These newborns are at risk of getting infection and various complications. Prematurity is one of the cause of low birth weight. Any complications in these newborns lead to admission in Neonatal intensive care units[1].In 2015, 20.5 million newborns, i.e. 14.6% of all babies born globally were of low birthweight. These babies mainly died in their first month of life and those who survived faced lifelong consequences including a higher risk of stunted growth, lower IQ, and adult-onset chronic conditions such as obesity and diabetes[2].The infant mortality rate in India in 2020 is 29.848 deaths per 1000 live births which is reduced to 3.48% from 2019 which was 30.924 deaths per 1000 live births.[3]According to World Health Organization, Low birth weight (LBW) is defined as a birth weight of an infant of 2,499 gm. or less, regardless of gestational age. Categories of LBW are very low birth weight (VLBW), which is less than 1500 gm,and extremely low birth weight (ELBW) which is less than 1000 g .Normal weight at term delivery is 2500gm–4200 gm.[4]

Parents of infants admitted to the NICU experience stress, depression, anxiety, and feelings of powerlessness, helpless in the environment of the NICU. These situations are very difficult and painful for parents. They have excessive distress compared to the parents of healthy infants. The mothers are scared and nervous. Due to their baby's admission in NICU and tension of illness and stress they are unable to produce enough amount of milk to feed their baby[5]. Premature babies and low birth weight babies are more prone to develop feeding difficulties like feeding intolerance which can be an early sign of necrotizing enterocolitis (NEC), which is the most dangerous gastrointestinal complication of prematurity[6]. Breast feeding has many health advantages for both mother and baby.Breast milk contains all the nutrients which baby needs during first six months of life. It consists of antibodies which help to fight against various diseases. It is easily digested than formula feed, and changes from feed to feed to suit each baby's unique needs, making it the ideal food to promote healthy growth and development[7].Colostrum consists of high amount of immunoglobulin A(IgA) which protects the baby from getting sick by forming a protective layer in baby's nose, throat and digestive system. It also protects from diarrhoea, eczema, asthma, middle ear infections, respiratory infections and obesity and diabetes in childhood and later life[8]. The use of mother's own breast milk as compared to formula feed during initial hospitalization has a positive impact in reducing potential serious neonatal morbidities and also contributes to improvements in neurodevelopmental outcomes[5].Low birth weight babies cannot suck the breastmilk directly from the breast, so there is a need to express breast milk. Breast milk can be expressed manually or by breast milk pump. The breast milk pump can be electric or manual. Manual expression of the breast milk is easy, convenient and inexpensive. Milk is expressed by hand and can also be used for later feeds. It helps to prevent breast engorgement. Milk expressed by hands help to produce more milk because of skin to skin stimulation. It does not cause discomfort or pain compared to breast milk pump[9]. The delay

in initiation of feeding, the immature development of the mammary glands and the inhibition of milk ejection caused by stress may result in poor milk yield and decline in milk production[5].Promoting breast feeding is a well-known, simple and efficient strategy to decrease morbidity and mortality in children all over the world; therefore any intervention that can increase breast feeding rates may be part of interest to health care personnel.

The investigator while working in NICU came across with the mothers whose babies are admitted because of low birth weight and understood their anxiety related to feeding of baby and developed interest in helping mothers to cope up with their newborn stay in NICU.Most societies introduce prayer or meditation to reduce stress. It is done repeatedly at a particular time of the day. Along with meditation, systematic relaxation, self-hypnosis, yoga, and biofeedback are other forms used for relaxation of mind and body and reduction of stress. Music has also been used as a form of therapy to induce relaxation throughout history. Music therapy is simple, cheap and non-invasive procedure and helps to promote physical and psychological well-being. Studies have shown that music can reduce maternal anxiety which will help the mother to cope with the situation.

Music therapy has been studied in a variety of environments including operating rooms, NICUs, depression, mentally challenged children and a variety of other psychological disorders associated with stress[5].Music can induce the relaxation response by being both distracting and soothing. Breast milk secretion can be stimulated by music therapy. Music therapy activates the central nervous system, which in turn stimulates breast milk secretion.

Material and methods:

A quantitative approach withQuasi Experimental-Non-equivalent control group post-test only design was used for conducting the study. The independent variable was music and dependent variable was breast milk secretion. Study population in this study was Mothers of low birth weight babies who are required to do expression of breast milk and their babies were admitted in NICU. Mothers with postnatal day 3 were included in the study. Mothers with history of hearing deficiency and with nipple abnormality were excluded. Screening test for hearing of all samples were done. Those who were identified with hearing problems were also excluded. 40 mothers were selected by using Non-Probability Purposive Sampling method. Samples were divided as 20 each in experimental group control group.

After doing the validity of the tool by experts the final tool were prepared with two sections. Section 1 withDemographic Variables like age(in years),gravid and type of delivery. Section II was Observation Table to record volume of expressed breast milk which included the number of days for giving music and volumeof expressed breast milk in ml.

The research was approved by Institutional Ethical Committee after presenting research proposal with data collection tool. Permission was taken from hospital administrators, HOD of Obstetrics and Gynaecology. Written Informed Consent was taken from each mother after explaining the procedure. Code numbers were given to the data collection tool to maintain the confidentiality.

Calibration of headphones and mobile phones was done and letter was received from the Electronic Engineer. Reliability of measuring cup is not required as it is standardized by the manufacturer. Letter for selected music was also obtained frommusic teacher.

Mothers were seated comfortably. Hand washing was done and mothers were asked to clean the breast music was given with the help of headphone at a comfortable level of volume from phone. At the end of 20 minutes manual expression of breast milk was done by the researcher in experimental group for next 10 minutes continuing to listen the music. The volume of expressed milk was measured in ml by using a measuring cup. The breast milk was collected once in a day in morning, according to their feeding schedule for 4 days. In control group also breast milk was expressed by researcher for 4 days without listening to music. For each sample separate bowl and measuring cup were used and sterilized by ETO. Headphones were cleaned after every use, using antiseptic solution.

Result and Discussion:

The data was analysed using descriptive and inferential statistics. Frequency and percentage was calculated for demographic variables. Assessment of volume of expressed breast milk done by calculating mean volume in both the groups. Unpaired t test was used to assess the effectiveness of music.

Table No 1: Frequency and percentage distribution of Demographic variables

N=40

Sr No.	Variables		Experimental		Control	
			Freq.	(%)	Freq.	(%)
1	Age(in years)	19-21	3	15	5	25
		22-25	11	55	8	40
		26-29	5	25	6	30
		30 & above	1	5	1	5
2	Gravida	Primigravida	8	40	9	45
		Multigravida	12	60	11	55
3	Type of delivery	Normal	12	60	14	70
		LSCS	8	40	6	30

Table number 1shows that in age maximum were in between 21-25 years both in experimental and control group .In gravid too maximum were multigravida. In Type of labour 70% were had normal delivery.

Table No 2:Assessment of volume of expressed breast milk in Experimental and Control group.

N=40

Days	Experimental Group	Control Group.
Day 1(ml)	8.95	6.35
Day 2(ml)	15.6	11.4
Day 3(ml)	23.6	17.45
Day 4(ml)	33.25	24.2

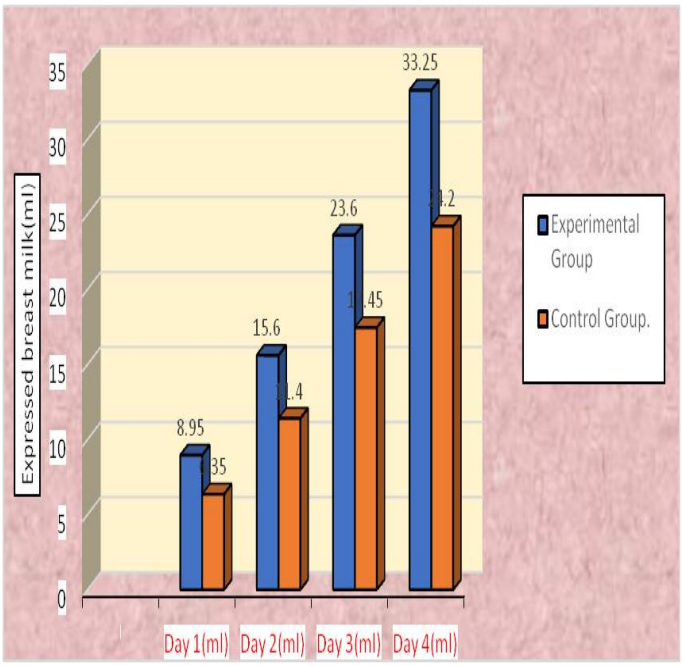

Figure No 1:Assessment of volume of expressed breast milk in experimental and control group.

Table no. 2 and figure No 1 shows that there is increase in the mean volume of expressed breast milk in both groups. On day 1 it was 8.95 ml in experimental group which was more than control group (6.35ml). Similarly, on day 2 and day 3 there was difference of 4-5ml between experimental and control group. But on day 4, the volume of expressed breast milk is consistently increased in experimental group i.e, 33.25 ml than in control group i.e. 24.20 ml. Findings shows that apart from natural increase in volume of breast milk there was more increase in volume of experimental group compared to control group.

Table no 3:Comparison of mean volume of expressed breast milk between experimental and control group (Day 1).

N=40

Group	Mean	SD	t	p
Experimental	8.95	1.43	5.68	0.00001
Control	6.35	1.46		

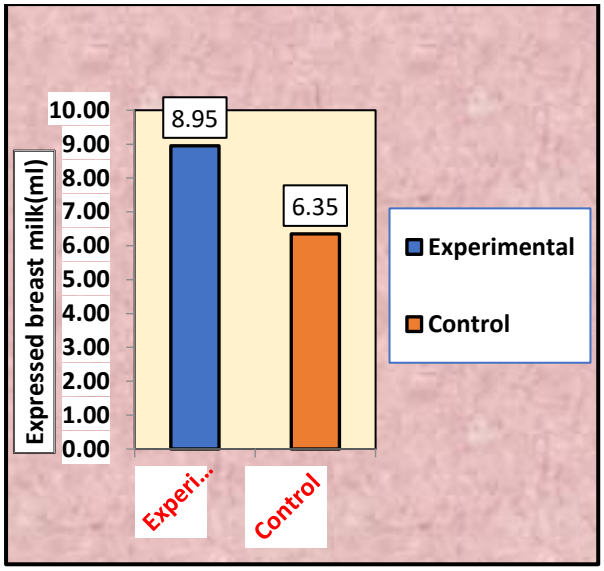

Figure No 2: Comparison of mean volume of expressed breast milk between experimental and control group (Day 1)

Above table shows that on day 1, in experimental group, the mean was 8.95ml with SD 1.43 and in control group the mean was 6.35ml and SD 1.46. The calculated t value was 5.68 with the P value is 0.00001 which is <0.005 which shows there is significant difference between the experimental and control group.

Table No 4: Comparison of mean volume of expressed breast milk between experimental and control group. (Day 4)

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N=40

Group	Mean	S.D.	T value	P value
Experimental	33.25	2.69		
Control	24.2	2.12	11.82	0

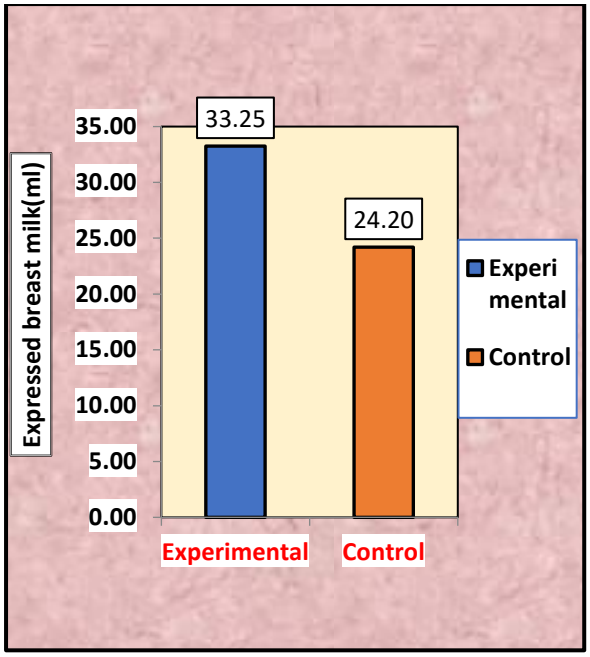

Figure No 3:Comparison of mean volume of expressed breast milk between experimental and control group (Day 4).

Table No 4 and figure No 3 depicts that there is difference in mean volume of expressed breast milk between experimental and control group. In experimental group the mean is 33.25ml (SD= 2.69) which is more than the control group mean i.e 24.20 (SD= 2.12). The calculated table value t= 11.82 with the p value of 0.000 which is less than 0.05. So, the hypothesis H0 is rejected and it concludes that music is effective in increasing the volume of expressed breast milk.

Similar type of study conducted by Pradesh Ghimire, Sarbesh Kumar Das (2018) to assess the effect of music therapy on volume of expressed breast milk in primi gravida. The study result showed with the mean volume of 29.62ml in experimental group and 20. 74 in control group with the p value of 0.0001.This study concluded that mothers who received music therapy had statically significant increase in volume of expressed breast milk as compared to control group[10].

Consistent findings were found in the study conducted by AK Jayamala, BL Preethi to evaluate the impact of music therapy on amount of breast milk secretion among mothers of premature newborns by reducing maternal stress. On the last day of the study, saliva from the mother was collected to estimate the salivary cortisol level during the sessions with Music Therapy and Non-Music Therapy. Music therapy was found to be associated with a substantial reduction in stress levels, as evidenced by an improved PSS score and lower salivary cortisol levels. Mothers who received music therapy had significant increase (p-value- 0.033) in expressed breast milk as

compared to mothers who did not listen to music. Study concluded that music therapy is a simple technique that can be used in the breast milk expression room to increase breast milk secretion in mothers who are stressed due to their neonates being admitted to the NICU[5].

DISCUSSION:

Music therapy has been shown in studies to relieve maternal anxiety, assisting mothers in coping with their infants' stay in the neonatal intensive care unit (NICU), and to influence preterm behavior, offering extended periods of quiet sleep, less crying, and an increase in weight gain[10].Music can induce the relaxation response by being both distracting and soothing. Breast milk secretion can be stimulated by music therapy. Music therapy activates the central nervous system, which in turn stimulates breast milk secretion. The hypothalamus sends impulses to the autonomic nervous system, which relaxes the mother and activates the sympathetic nervous system, which signals the posterior pituitary gland. The oxytocin hormone is produced by the posterior pituitary gland[11]. The study findings showed that the intervention of music was useful in increasing the volume of expressed breast milk. While considering the variables like gravida and type of delivery it needed to be more defined as it can change the findings. The volume of expressed breast milk in primi gravida is tend to be less than in multi gravida because of the experience. But in the present study the researcher has taken samples both primi and multi gravida as the study period was not enough to get the calculated sample of 40 with only primigravida or multigravida. When we consider normal delivery and LSCS, the mothers undergone LSCS may have more pain and it can reduce the milk production and is difficult to express breast milk comfortably. But in this study the researcher has included both type due to limited time period.

In the present study expression of breast milk was done by the researcher manually. This was done to main the consistency of expression but many mothers felt it uncomfortable. Expression of breast milk would have also been done by breast milk pump and it could have been more consistent in data collection.Researcher has observed during clinical posting, hardly some mothers are ready to use breast pump mainly because of pain.And the breast pump should be separate for each mother and it causes more pain than manual expression so researcher did manual expression of breast milk..

Some samples were not ready to listen to music for 30 minutes for 4 days. So it was difficult for the researcher to convince the samples. But there were also many samples who were interested to listen to music for the wellbeing of their baby.Even though the study findings show that there is effect of music on volume of expressed breast milk, the observation and intervention is given once a day i.e. in the morning between 8am-10am according to babys feeding schedule. There can be many

factors like diet of mother, psychology of mother, surrounding environment and family support which can affect positively or negatively on breast milk secretion. So the intervention and observation can be given twice a day for better and clear understanding also listening to music can be extended for more days.

The researcher may have generalized the study only if it is done with more samples with more specified inclusion criteria like only primigravida and normal delivery. Researcher felt and understood more about the importance of non-pharmacological methods for increasing the breast milk production and relaxing the mind. The selected samples became familiar and found themselves comfortable and relaxed and also expressed satisfaction. The researcher also felt the need that music should become a routine for every mother who is breast feeding or expressing breast milk, as it is helpful in relaxing the human mind, thereby it can improve the psychology, diet pattern, care of child etc. Study findings will be handed over to the administrators so that it may come in to the routine practice.

CONCLUSION:

The intervention of music therapy showed a significant increase in volume of expressed breast milk among mothers of low birth weight babies. Music therapy activates the central nervous system which signals the posterior pituitary gland to produce the oxytocin hormone, which increases the production of breast milk.

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CONFLICT OF INTERESTS

No conflict of interest.

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