Research Article

The Effect of Quran Vocalizations on Pain Relief in Neonates During Treatment Procedures

Pouneh Zolfaghari[1], Maryam Farjamfar[2], Elahe Ebrahimpour[1], Elahe Yahyaei[3] and Mohammad Bagher Sohrabi[4]*

[1]*Vice-chancellery of Health, Shahroud University of Medical Sciences, Shahroud, Iran*

[2]*Department of Psychology, School of Medicine, Shahroud University of Medical Sciences, Shahroud, Iran*

[3]*Vice-chancellery of Education, Shahroud University of Medical Sciences, Shahroud, Iran*

[4]*School of Medicine, Shahroud University of Medical Sciences, Shahroud, Iran*

*Corresponding author: Mohammad Bagher Sohrabi, School of Medicine, Shahroud University of Medical Sciences, Shahroud, Iran

Abstract

Introduction: Pain is a destructive one and remains in the mind of the child suffering from it Pain management in newborns through pharmaceutical and complementary medicine, including Quran recitation is done. Hence the aim of this study was to effect of Quran vocalizations on pain relief in neonates during treatment procedures in Imam Hossain hospital of Shahroud in 2014.

Methods and Materials: This cross-sectional study that compared with study of Quran audio impact in reducing neonatal pain during medical procedures performed. Sample size was estimated to be about 120, and this number of the subjects was selected in six months period. The data were recorded in check list prepared according to also, theory of development and Lawrence s Neonate-Infant pain scale [NIPS].

Results: In the intervention group, 28 patients (46.7%) were female and the rest were male while 29 patients in the control group (48.3%) were male and the rest female that were not significant differences. The results of this study showed that the experimental group, the mean number of breathing, crying, movements of arms and legs as well as the mean state of consciousness at the end of treatment compared to baseline that this differences were significant (p<0.001), while in the control group this difference was not seen. So the results showed that the highest impact Quran was the end of the procedure started 10 minutes to reach its maximum impact.

Conclusion: According to the results can be obtained from more appropriate to examine the behavioral pain symptoms of physiological performance of this tool to promote and Quran recitation to reduce pain in newborns help, but it is necessary to determine the duration of the sound of heavenly research did more.

Keywords: Pain; Neonatal; Quran vocalizations; Behavioral sign's; Treatment procedure

Introduction

Pain is one of the most common human problems that has been experienced more or less in all people but the symptoms of it are usually different in different ages [1]. One of the most common misconceptions is that infants do not feel pain because their nervous system has not developed enough. No longer is the experience of pain painful and harmful for infants because they lack memories of pain [2]. Recent research has provided ample evidence that infants, even preterm infants, have a more mature central nervous system than might be thought. The onset of neural pathways myelinated in the fetus is during the second and third trimesters of the fetus, but may begin earlier. Fine or non-myelinated fibers also transmit the stimulation of pain, but only slower the rate of transmission [3]. Stress from pain, even brief and brief, can lead to problems such as (hypermetabolic status, cardiac arrhythmias) and even complications and delay in neonatal recovery. In infants, behavioral and physiological symptoms of pain are the only way to express it. For this reason, less research has been done to try and quantify neonatal pain and to facilitate the identification of pain intensity by nurses [2]. In study by Poznanski, infants responded to circumcision

pain with screams and limb movements [4]. Other studies have also shown that in neonates, pain reactions can occur in the form of leg pulling, upper and lower limb flexion, facial tearing, and crying [2, 4].

Also in Kuner & Fuller study, it was found that nurses' work experience and experience are directly related to their diagnosis and rating of neonatal pain [5]. Nurses' experience and skills, especially those working in the neonatal ward, are vital. It was also found that these pain symptoms in infants can be altered by altering the vital signs of their infants, so that Beaver has shown in a study that elevated heart rate and blood pressure and is decreasing in blood oxygen levels indicate pre-term neonatal pain [6]. Whichever of these diagnostic symptoms is present, neonatal pain should be controlled as soon as possible after diagnosis. Different methods such as drug therapy, massage therapy and complementary medicine are used to control neonatal pain. One of the most important methods of complementary medicine is music and vowel therapy and one of the most beautiful sounds is the beautiful sound of reciting the verses of the Holy Quran with its own order which is considered as one of the most magnificent aspects of the Holy Quran miracle [7]. In the verses of the Holy Quran, the letters are uniquely aligned, so that when they hear, there is no rhythm or weight, no rhythm or weight, no rhythmic rhythm is heard, so that no text is loud Reading, like the Holy Quran, is not compact and effective [8]. In Iran, many studies have been done on the effect of the Quran's sound on patients in various fields and positive results have been obtained.

For example, the results of the study [7], to investigate the effect of the Holy Quran on vital signs of patients before cardiac surgery showed a significant difference in heart rate and respiratory rate in the intervention group compared to the control group [9]. In Khatoni study to investigate the effect of the holy Quran on the level of anxiety in patients admitted to ICU in one of Tehran hospitals, Khatoni concluded that listening to the Holy Quran may reduce anxiety in patients [10]. Regarding the necessity of neonatal pain control when performing medical and therapeutic procedures to prevent neurobehavioral complications and given the positive effects of Quran phonics on the control of physical and psychological problems in a number of patients and also because there has been no study on the effect of the Holy Quran on pain control during neonatal treatment procedures, the aim of this study was to effect of Quran vocalizations on pain relief in neonates during treatment procedures in Imam Hossain hospital of Shahroud in 2014.

Materials and Methods

This study was a case-control study that was conducted in the first half of 2014. The study population included 120 neonates admitted to the neonatal ward of Imam Hossein hospital in Shahroud. In this study continuous sampling method was used. The researcher, after obtaining the necessary authorization for the research from Shahroud University of Medical Sciences, was present in the study environment for several consecutive days and selected samples from the neonates who were eligible to participate in the study. A written letter from parents was included in the

study. Samples were randomly divided into two groups using four randomized blocks. The children were divided into two equal case groups (Quran voice broadcasting) and control groups (without Quran voice broadcasting). Inclusion criteria for neonates included: Iranian nationality, fetal age 34-38 weeks at birth, weight over 2500 g, Apgar score of 7 and above at first and fifth minutes of birth, lying in bed, breast feeding, evidence of auditory system health and no history of severe response to sound stimulation in nursing reports, lack of intrauterine growth retardation, absence of anomalies and nervous system problems (hydrocephalus, microcephaly, meningo mycelium, intrahepatic rheumatoid arthritis, spina bifida, cerebral palsy), absence of acute disease (neonatal infection, asphyxia, severe hypoxia, intestinal necrosis, acute pulmonary disease), anemia and lack of sedative drugs such as phenobarbital and my mother had a history of addiction to drugs. Exclusion criteria included: Severe reaction to voice stimulation during intervention [including: hiccup symptoms, tilted mouth, eye squeeze, eye rolling, tongue twitching, finger opening, motor scrambling, crying, screaming and stuttering], abnormal physiological parameters such as heart rate greater than 200, reduction in arterial oxygen saturation were less than 80% during the intervention, and infant's need for any medical or nursing or touch intervention during the study.

For the infants of the case group while performing the medical procedures, the Quran voice transmission via A4TECH model EST2010 was used. The sound level of the audio player was determined in dBel by the sound level meter and under expert supervision. For the control group no Quranic sounds were broadcast. Before the intervention, the infant's medical record was reviewed by the researcher and demographic information including variables such as type of delivery, date of birth, sex, gestational age, chronological age (number of days past the baby's birth), birth weight, inclusion weight and minute Apgar The first and fifth were recorded in the data collection form. Then the neonate's hearing was confirmed by observing the startle reflex and response to the acoustic stimulus and the baby's weight was determined by digital scales. Before attaching the baby to the monitor, the researcher made sure that the baby received, changed, and needed no nutritional intervention and care during the next 40 minutes. Then, the hands were washed, the infant was laid back on the couch, and hair neutrodes were attached to the infant for evaluation of physiological indices. The oxygen saturation electrodes were mounted on the anterior and posterior surfaces of the foot and covered with carbon to increase the accuracy of the device and to prevent light effects. To record heart rate and respiratory rate, three electrodes were mounted on the infant's chest in a triangular fashion and fixed with anti-allergic adhesive to prevent displacement during physiological index recording.

To reduce infant manipulation, the indices were measured continuously and only the information recorded at the desired time was used to calculate and compare differences between groups. Earphones were used to prevent the effects of sound on other neonates during audio playback. The handset was connected to the MP3 Player, the volume was controlled on the device, and then the handset was placed on the baby's ear. After the baby was no longer

in need of touch or manipulation, information recording began. Physiological responses were recorded every 10 minutes in three stages immediately before the intervention, during the intervention (10-20 minutes after the intervention) and 10 minutes after the intervention. The first stage of recording the infant's physiological responses was performed just before the infant started and did not manipulate based on the numbers that the monitor displayed. Then, if the infant belonged to the intervention group, the Holy Qur'an's voice would begin to be broadcast to him and he would continue to record physiological responses at 10-minute intervals. The Quran sound was transmitted to the intervention group for 20 minutes and at 20 minutes after recording the physiological responses, the sound player was switched off and the last recording was performed 10 minutes after the mute.

The infants in the control group, like the intervention group, were attached to the monitor and their physiological responses were recorded every 10 minutes. In order to eliminate the confounding effect of headphones in the control group, infants were put on earphones, with the exception that no sound was delivered. Room temperature was maintained in the range of 27-28 °C. All infants in both groups were followed for 6 months during medical procedures including blood sampling, venipuncture, intramuscular injection, gastric catheterization, and cerebrospinal fluid (LP) ingestion. Instruments for measuring changes included neonatal balance, cardiac monitor, arterial oxygen saturation device, and continuous monitoring of experienced nurses during procedures. Simultaneous observation was used to avoid measurement error. Two trained colleagues were asked to simultaneously monitor the heart rate, respiratory rate, and oxygen saturation percentage at the desired time on the monitor and to record in separate questionnaires for each infant. The mean of these numbers was then used to report changes in each infant. Neonatal pain assessment tools have been used to assess behavioral symptoms of neonatal pain. This tool (Neonatal Infant Pain Scale) consists of 6 options that only have zero, one, and two scoring options, and five options, namely face states, respiratory patterns, hand movements, leg movements and level of consciousness, with scores of zero and one. The score range will be between zero and seven. These changes are recorded in the specific form of each baby. After collecting, the isolates were entered into SPSS 16 software and analyzed by statistical tests. In case of non-normality of variables, Mann-Whitney test was used to compare the means between the two groups and Wilcoxon was used to compare means within groups. In normal distribution, independent t-test was used to compare the means between the two groups. Parents of infants who participated in the study were provided with complete information about the research and its aims and importance. Parents were assured that participation in the study was voluntary and not participating in the study would not affect their infant care services and information, and that information would be kept confidential. If parents wish to participate in the study, a consent form is provided for them to read and sign.

Results

Of the 120 neonates who were randomly divided into two equal groups of case and control, the demographic and contextual information (gender, type of delivery, neonatal apgar score at 1 and 5 minutes at birth, fetal age, age, birth weight and neonatal weight at the time of study) no significant difference was observed between two groups. These results are shown in Table 1. Based on independent t-test in the intervention group, mean difference in breathing rate, crying intensity, hand and foot movements and also in Mann-Whitney test mean difference in consciousness status at the end of the intervention was significantly different from the baseline level (p <0.001). This difference was not observed in the control group. The results are shown in Table 2. So the results also showed that the maximum effect of the Quranic phoneme started at 10 min and reached its maximum effect at the end of the procedure (min of 20).

Table 1: Demographic characteristics of neonates in two groups at baseline.

Variable	Intervention group (n=60)	Control group	
Gender (girls / boys)	32/28	31/29	0.213
Type of Delivery (Normal / Cesarean)	41/19	39/21	0.178
Apgar minute 1	8.17±0.45	8.23±0.59	0.235
Apgar minute 5	9.41±0.75	9.35±0.68	0.088
Fetal Age (Week)	33.28±5.12	34.08±4.88	0.109
Calendar Age (days)	3.85±4.25	4.10±4.30	0.075
Birth Weight (g)	2750±350	2690±438	0.146
Study Weight (g)	2990±523	2630±450	0.144

Table 2: Comparison of mean score of physiological variables and mean state of consciousness at the end and baseline in the intervention and control groups.

Points	Intervention group (n=60)	Control group	
Before intervention	6.4±1.5	6.2±1.8	0.452
After intervention	3.5±3.8	5.7±0.5	0.001

Discussion

The results of this study showed that there was a significant difference between the two groups in terms of changes in physiological symptoms before and after the intervention. Among the physiological symptoms, the most common symptoms were facial flares. Seymour et al., in their study suggested that nurses were more concerned with sweating and discoloration than physiological symptoms among infants [11]. The most commonly observed behavioral signs are facial changes and then changes in respiratory pattern and crying. This indicates that during behavioral procedures, changing facial expressions, crying, and changing the respiratory pattern are key clues to assess neonatal pain. Many studies have been done to evaluate the pain of infants and also how nurses and parents have used and interpreted the pain, which have yielded similar results. One of these studies is Bore et al., Which has been conducted to investigate neonatal reactions to painful stimuli. Results showed that preterm infants use more physiological symptoms, especially increasing of heart

rate, respiratory rate and blood resure, and term infants use behavioral symptoms such as crying and facial changes to express pain [6]. In Jones' study, restlessness, crying, and frustration were reported as the most behavioral symptoms of pain [12]. In their study, Throbbed and Howard stated that nurses often identified restlessness, frowning, crying, hypertension, and respiratory distress as both behavioral symptoms in term and preterm infants [2]. In both of these studies, a pain assessment tool was used, and it is noteworthy that although in the Howard and Thurber study, the neonatal intensive care unit nurses used more equipments than the Jones research, similar symptoms were observed. And the other point is that out of the selected symptoms, only the heart rate monitor needs a special device. These results suggest that nurses with the least equipment needed can use their observational skills to assess neonatal pain. Lawrence states that the standard form of infant pain assessment has high internal validity and can be used to demonstrate the severity of infant pain by referring to behavioral symptoms during the procedure and even after the procedure. The results of the present study also showed a decrease in physiological stress in the intervention group compared to the control group. While Coleman and Pratt found in a study that playing music in premature infants increased the rate of breathing and decreased heart rate [12]. A study by Calabro et al., showed that music had no significant effect on neonatal respiratory rate and heart rate [13]. According to the study by Arnon et al., The mean heart rate in the live music group was significantly lower than the two recorded and control groups. They concluded that playing live music had a greater impact on the physiological and behavioral responses of preterm infants than recorded music [14].

In a study conducted by Majidi to investigate the effect of the holy Quran on the level of stress in patients, the results showed a decrease in breathing and pulse rate after the intervention in the holy Quran compared to the control group [15]. The present study is consistent. The findings of this study are in agreement with the study of Collins, Kak and Chaw. In the study of Chaw et al., Neonates who received music therapy during endotracheal suctioning had higher oxygen saturation levels than the control group [16]. In the Cassidy and Stendley study, in neonates receiving lullaby music, the arterial oxygen saturation level was significantly higher than the control group [17-20], however, Calabrera et al., did not report a significant difference in the effect of music on the level of saturated oxygen saturation [13], which is different from the results of the present study. Also in a study by Neil et al., the effect of music and sound recorded in neonatal intensive care units was compared, with no difference in arterial oxygen saturation [2].

The differences in the results of studies that examined the effect of music on preterm infants may be due to differences in the number of samples, the use of different types of music in different ways, the effects of confounding variables, different methods of data collection, and so on. So far, no study has been done on the effect of the holy Quran on infants, but the results of this study are in line with the studies on the effect of the holy Quran on the level of anxiety and physiological responses of the patients. For example,

the results of a study by Nasrabadi showed that listening to the Qur'an reduces the severity of pain and its associated behavioral symptoms in patients after abdominal surgery [17]. In another study by Majidi to investigate the effect of Quran phonation on the level of anxiety in patients admitted for angiography, the results showed a decrease in personality and situational anxiety, as well as a decrease in systolic and diastolic blood pressure, and pulse and respiratory rate in the Quran group [7]. In a study by Elder Abadi et al., to investigate the effect of the holy Quran on vital signs of patients before cardiac surgery, there was a significant difference in heart rate and respiratory rate between the intervention and control groups. They concluded that listening to the Holy Quran recalls stress- dependent physiological responses in patients [9]. Despite the contradictory findings regarding the effect of music on the physiological responses of preterm infants, the results of all studies in Iran show the positive effect of the holy Quran on reducing pain and anxiety in adults. Since most of these studies used the verses of surah Yusuf, so according to the expert advisor, verses 7-23 of surah Yusuf were chosen for this study by the voice of Master Mohammad Shayta Anwar. Undoubtedly, the use of other verses of the holy Qur'an can pave the way for further research into the effect of this heavenly calling. Music and tunes reduce the activity of the neuroendocrine and sympathetic systems and allow the parasympathetic to overcome the sympathetic, resulting in relaxation and sleep, decreased heart rate, deep breathing regulation, relaxation of the muscles and induction. The state of consciousness is calming. The neuroendocrine system is affected by music in three ways: 1-The secretion of endorphins from the pituitary gland which relieves pain and affects mood and memory. 2- Decreased secretion of catecholamines, such as epinephrine and epinephrine light from the adrenal gland, which decrease heart rate, metabolism, blood pressure, free fatty acids and oxygen consumption. 3- Decrease in adrenal corticosteroids that are released during stress [17]. Another mechanism for how music works is that music may distract the infant from distracting noise and thereby reduce the baby's stress responses. This response has been suggested as a tool to relax the central nervous system and reduce stress responses [7]. Finally, it can be concluded that the sound of the Holy Quran may have reduced stress in neonates with the mechanism of decreased sympathetic activity and secretion of catecholamines and increased parasympathetic activity and endorphins secretion.

Conclusion

According to the results of this study, behavioral and physiologic observable symptoms can be used to assess neonatal pain. Of course, health care providers and nurses may also pay less attention to physiological symptoms than behavioral symptoms. But as the makers and users of pain assessment tools state, the combinations of a behavioral pain assessment form with physiological symptoms of pain increases its content validity. Since there was no negative effect on infants' physiological parameters in the intervention group, so further research can be done to reduce stress and improve physiological status of neonates in hospitalized infants was used

in the hospital. Limitations of this study include the inability to measure the intensity of ambient noises, the lack of a monitor with a printer, and the presence of unwanted ambient noises.

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