

## **Music therapy intervention in the neonatal intensive care unit environment**

**Shmuel Arnon\***

Vianna et al.,<sup>1</sup> in their open randomized controlled trial, utilized two music therapists to systematically work with mothers of preterm infants in the neonatal intensive care unit (NICU) of their institution. Sessions were held 3 days a week for 1 hour and comprised four movements: verbal expression, music expression, lullabies and relaxation, and closing, resulting, at the first follow-up visit after hospital discharge, in a significantly higher breastfeeding rate in the intervention group than in the control group. Higher breastfeeding rates were also shown at the 60-day follow-up visit. I congratulate the authors for their interesting work, which is, to my knowledge, the first to focus on the impact of music therapy on breastfeeding rates among mothers of premature neonates. These findings may encourage caregivers to use music as a stress reliever to mothers who need support and find it hard to continue with breastfeeding during this difficult period in their life. It remains to be seen whether it was the music intervention that caused mothers to be more relaxed and thus more willing to breastfeed, or whether it was the get-together in a totally different environment to express anxiety that made mothers more able to deal with stressful situations and thus respond to the infant's needs.

### **Should music therapy be introduced into the NICU?**

The question whether music therapy should be introduced into the NICU environment has to be addressed very carefully and is divided into two parts: the benefit of music therapy for infants and the benefit for mothers.

Over the past decade, music has been introduced into the NICU as a therapy designed to enhance treatment and facilitate growth and development of premature infants. The 2002 meta-analysis of the efficacy of music therapy for premature infants demonstrated significant clinical benefits of music across a variety of physiological and behavioral measures.<sup>2</sup> The benefits that were most noticeable were weight gain, reduced observed stress behaviors and length of hospitalization, and increased oxygen saturation levels for short periods of time. Further, the 2006 North American survey reported that 72% of the NICUs provided music therapy for premature infants.<sup>3</sup>

There have been only a few studies that have explored the benefit of music therapy for mothers of preterm infants. Recently, Schlez et al.<sup>4</sup> showed that, compared with kangaroo care alone, kangaroo care combined with live harp music therapy played to mother-infant dyads had a significantly beneficial effect on maternal anxiety ( $p < 0.01$ ). Here again, close contact of mothers with their child and music therapy (i.e., kangaroo care combined with live music therapy) served as a stress-reducing technique for mothers.

### **Music delivery methods**

Different measures have been used for music delivery, for example, recorded and live music performed by one or more instruments and female therapist voice or maternal voice. Arnon et al.<sup>5</sup> demonstrated the superiority of live music (female voice and harp music combined) over recorded music or no music, inducing reductions in heart rate and

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No conflicts of interest declared concerning the publication of this editorial.

**Suggested citation:** Arnon S. Music therapy intervention in the neonatal intensive care unit environment. *J Pediatr (Rio J)*. 2011;87(3):183-185.  
doi:10.2223/JPED.2091

anxiety behavior in stable preterm infants. Furthermore, live music added calmness to the working staff and parents. Given that there are substantial theoretical and empirical data to support that female singing or speaking softly in a singsong manner has a soothing effect on infants and that the infant already starts to recognize the mother's voice even before 24 weeks and can demonstrate a preference for it right after birth,<sup>6</sup> singing by the mother, especially with other stimulations such as skin-to-skin contact (i.e., kangaroo care), can be a very effective way to soothe infants. However, these assumptions have still to be validated in studies of good methodological quality.

### When to start music intervention?

It was shown that selected recorded lullabies may begin at 28 weeks' gestational age, when infants are still in incubators. Live infant-directed lullabies along with multimodal stimulation (auditory, tactile, visual, and vestibular interventions) may already start at 32 weeks' gestational age.<sup>2</sup>

### Which kind of music is preferable?

Most studies have been using lullabies as the source for intervention. Lullabies are simple musical structures that infants can clearly differentiate, comprising lower pitch and slower tempo that are used and recognized across cultures.<sup>2</sup> Using other kinds of music such as classical music, which is not soothing, constant, or stable and relatively changing might produce alerting responses. The newborn and especially the preterm infant are unable to discriminate complicated frames of tunes, making classical music unsuitable for the NICU environment.<sup>7</sup> A word of caution was issued against using music in the NICU not documented by research, such as radio station broadcast music and toys that generate music and sounds.<sup>2</sup>

### The NICU setting

Infants and young children do not have the adult-like ability to discriminate figure or target sounds (music) from ground noise (i.e., background noise) until 9 to 12 years of age, depending on what kind of test is used.<sup>8</sup> Therefore, in order to clearly discern music from ground sounds, infants need quiet conditions and few competing sounds. To comply with the current recommendations for safe sound levels within the NICU, the ambient noise should be reduced to the minimal possible level and not exceed an hourly Leq of 50 dB, hourly L10 of 55 dB, and 1-second duration Lmax of less than 70 dB, all A-weighted (slow response).<sup>9</sup> This can be achieved by measures such as closing the doors, silencing the monitor's alarm, and reminding the parents and medical personnel to keep their voices down. In this

manner, music can be played at a mean comfortable volume, without causing hyperalertness or other adverse effects.

### Which variables should be tested to indicate music effect?

Most studies testing music intervention effect used physiological or behavioral variables, such as heart rate, oxygen saturation, and different behavioral scales, with or without external stimuli (e.g. pain). Recently, a near-infrared spectroscopy (NIRS) method was introduced to study responses to speech and music, with limited efficacy.<sup>10</sup> On the other hand, pacifier-activated lullabies, which were used successfully in few studies, have been shown to be useful tools for both promoting sucking and investigating the efficacy of music intervention.<sup>2</sup>

### Recommendation for future research to test music interventions in the NICU

Detailed guidelines, based on the evidence of high-quality research, were issued to evaluate the validity and reliability of the effects of sound and music in the NICU. Philbin & Klaas.<sup>11</sup> offered a research evaluation checklist for clinicians planning an auditory intervention study. In another recent work, a set of guidelines for music-based interventions is suggested to improve reporting and advance evidence-based practice.<sup>12</sup>

### Summary

Studies applying music to both parent/mother-infant dyads have the advantage of enhancing developmental goals in the NICU and function to reduce stress, to provide developmental stimulation during a critical period of growth, to promote bonding with parents, and to facilitate communication, neurological, and social development.

The study of music for premature infants warrants further research. Meticulous study design and reporting of studies involving music in the NICU will promote evidence-based practice in the field.

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## Hepatitis A virus infection: progress made, more work to be done

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Hepatitis A virus (HAV) has a global distribution, being the most common cause of viral hepatitis worldwide. Approximately 1.4 million new infections are diagnosed each year, but the true incidence is considered to be much higher due to under reporting. South America is considered an endemic area, with a high prevalence of seropositivity, especially in young individuals. Lower socioeconomic status, overcrowding, poor sanitation, and inadequate water treatment are commonly associated with higher incidence and asymptomatic childhood infection in developing countries. Reported disease rates in these areas are therefore low, and outbreaks of disease are rare, since most adults are immune. In countries with transitional economies and in some regions of industrialized countries where sanitary conditions vary, children may escape infection in early childhood. These improved conditions may lead to more clinically evident hepatitis, as infections occur in older, more symptom-prone age groups, and reported rates will be higher. A large

population of susceptible adolescents and adults increases the likelihood of outbreaks. This shift in the epidemiology of HAV infection has been noted in various countries around the world.<sup>1-3</sup> In addition, adoption of hepatitis A vaccination has been variable, so that interpretation of endemicity using seroprevalence of antibody to HAV (anti-HAV) is problematic.

It is with this background, investigating a potential shift in epidemiologic pattern, that Krebs et al.<sup>4</sup> undertook an epidemiologic study of anti-HAV seroprevalence in children and adolescents in Porto Alegre, Brazil.

This was a follow-up of a similar study done in the same region a decade earlier.<sup>5</sup> The aim of this work was to compare anti-HAV seroprevalence in the pediatric populations of two clinical laboratories, after demonstrating that the laboratory and payment structure were surrogates for subject socioeconomic stratum. In addition, seroprevalence rates across age groups were compared for the two study periods.

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No conflicts of interest declared concerning the publication of this editorial.

Financial support: Bristol Myers Squibb (research support), Novartis (research support, consultant), Roche (consultant), Merck-Schering Plough (research support).

**Suggested citation:** Jonas MM. Hepatitis A virus infection: progress made, more work to be done. *J Pediatr (Rio J)*. 2011;87(3):185-186.

doi:10.2223/JPED.2106