

Effect of Recorded Maternal Voice on Quantitative EEG in the Preterm Newborn

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Background: Despite continued advances in quality medical care for premature infants, neurodevelopmental delay remains one of the most common complications of prematurity. It is also known that early diagnosis and intervention for developmental delays leads to improved outcomes. More recently, quantitative electroencephalogram (qEEG) has shown potential as a prognostic tool for identifying delays in preterm infants but remains an underutilized assessment. Maternal voice exposure has positive effects on autonomic stability and feeding vigor/tolerance in preterm infants. This novel study aims to investigate the effects of recorded maternal voice on qEEG patterns in preterm neonates. **Methods:** Prospective, randomized, placebo-controlled clinical trial with planned enrollment of 40 infants. Infants born at 24 0/7 - 32 3/7 weeks gestation, without congenital/neurologic anomalies, and admitted to the Newborn Intensive Care Unit (NICU), are eligible to participate. Enrolled infants have a baseline qEEG performed just prior to 33 weeks corrected gestational age (cga). A recording of their mother's voice or a blank control recording is then played for the infant (1 hour daily) for a 2-week intervention period (from 33-35 weeks cga). A second qEEG is obtained in the infant following the intervention period (from 35-36 weeks cga). The qEEG data is processed for quantitative spectral analysis.

Results: Enrollment is ongoing, with n=7 at time of submission. We hypothesize that infants exposed to their mother's recorded voice will have an increase in higher-frequency alpha and beta spectral powers on qEEG. This has previously been shown to correlate with long-term neurodevelopmental outcomes. If pattern differences match previously published results, recorded maternal voice may be a useful addition to NICU developmental care strategies, and the use of qEEG as a screening/prognostic tool in the neonatal population could be further explored.

Next Steps: Continued enrollment, data collection and analysis.

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