

Heart Rate Variability during Maternal Singing in Kangaroo Care Position in Stable Preterm Infants

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Background

Heart rate variability (HRV) is an indirect marker of the autonomic nervous system function. Maternal singing was suggested as a stress relieving modality for preterm infants.

OBJECTIVE: To evaluate HRV of stable preterm infants held in skin-to-skin contact (kangaroo care, KC) alone and during KC with maternal singing, in order to determine which of the two modalities is preferred for improving the balance of the autonomic response.

Design/Methods

Data were collected during KC with and without maternal singing (preferred lullabies). Heart rate and HRV were measured with a Masimo monitor and analyzed by software calculating HRV indices, including low frequency (LF) reflecting mainly the sympathetic tone, and high frequency (HF), reflecting the parasympathetic tone, and the LF/HF ratio. Measurements were done over baseline (10 min), singing or quiet phase (20 min) and recovery (10 min) periods. Behavioral responses were measured with the Als Modified Behavioral State Scale.

Results

Thirty-two stable preterm infants (gestational ages 32-36 weeks) were recruited. Heart rates ranged from 108-195 BPM with KC alone and 122-179 BPM during KC with maternal singing ($p=0.61$). HF power was higher during KC with maternal singing than with KC alone ($p<0.05$). LF power was lower during KC with maternal singing compared to KC alone ($p<0.05$), but only during the recovery period. The LF/HF ratio was lower and had less fluctuation across the periods of KC with maternal singing than in KC alone and was significantly lower during the recovery phase ($p<.001$). No significant differences in behavioral states were found between KC with maternal singing and KC alone.

Conclusions

Stable preterm Infants might experience better autonomic balance in response to KC with maternal singing than with KC alone. HRV might be a more sensitive tool to measure stress response than the behavioral scale in preterm infants. Maternal singing during KC might help mediate physiologic responses to stressful events in preterm infants during their stay in intensive care.