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Title: Sleep and Arousal Characteristics of Term and Preterm Infants from the Collaborative Home Infant Monitoring Evaluation (CHIME) Study Database.

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Background: Preterm (PT), and full term (FT) infants, during the first two to four months, have greater risk for Sudden Infant Death Syndrome (SIDS) in part due to immaturity of sleep and arousal.

Objective: These are studies using the archived digital recordings to analyze sleep and arousal characteristics from the CHIME study infants.

Design/Methods: We have obtained the archived polygraphic records of 555 infants from the CHIME national study database. The digital CHIME polygraph data were converted to European Data Format and were visually scored for sleep and spontaneous arousal using Somnologica[®]. Overnight records at term post menstrual age (PMA) or at 3 mon PMA age from ten PT and 8 FT infants were scored for quiet (QS), active (AS) and indeterminate sleep (IS) using standard polygraphic criteria. Video recordings were not available. During sleep, episodes ranging from 3 to 60 s, with increased heart rate pattern change (more than 2SD above baseline: calculated from 20 s baseline and each second during increased heart rate), increased frequency and decreased amplitude of EEG and increased EMG activity were scored as arousal.

Results: Mean \pm SD for gestational age (GA) in PT vs FT was 31.3 \pm 1.6 vs 38.8 \pm 0.9; for PMA was 45.2 \pm 5.2 vs 46.4 \pm 5.2; and for postnatal age was 13.9 \pm 5.3 vs 7.6 \pm 5.3 wk respectively. No differences were found in total recording time nor total sleep time between the 2 groups. Significant age effect was found for both QS (increased by age) and IS (decrease by age) in both groups. No significant effect for amount of time spent in AS as a function of age was found. Arousal index (# of arousals per hour) showed an age dependent increase in term infants ($R^2 = .385$). This age dependent increase in arousal frequency was not present in preterm infants ($R^2 = .094$). Although there was no significant change in mean arousal duration in AS in term infants as a function of age ($R^2 = .003$), the mean arousal duration decreased in preterm infants ($R^2 = .221$).

Conclusions: The CHIME database provides an important resource to further investigate sleep and arousal characteristics in infants at risk for SIDS.

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