

Sleep-disordered breathing, craniofacial development, and neurodevelopment in premature infants: a 2-year follow-up study

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Highlights

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Premature infants present a clear higher frequency of sleep problems at two years of age.

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Abnormal breathing during sleep is an important cause of these sleep problems.

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Abnormal breathing during sleep is also associated with developmental delays.

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The abnormal orofacial growth in premature infant plays a role in the abnormal breathing during sleep.

Abstract

Introduction

Sleep problems, neuro-developmental development, and [sleep-disordered-breathing](#) (SDB), are reported as more prevalent in [premature infants](#) than in full-term infants. We investigated the relationship between [neuro-development](#), and SDB in preterm infants at 24 months corrected age (CA) with a narrow palatal presentation over time.

Methods

We enrolled infants 40 weeks or younger at birth collecting obstetric and birth data. Participants were followed up at 6, 12, 18, and 24 months CA. We evaluated [craniofacial development](#) by inspecting and photo documenting [hard palate](#); sleep using sleep diary, [actigraphy](#) and night-time polysomnography-PSG-;

and development using [Bayley- Scales-of-Infant-Development](#) and Denver-Developmental-Screening-Test (DDST) at each visit and comparing results at six months and two years.

Results

244 premature infants [139 (57.0%) boys, [at birth: mean gestational age-GA- 31.5 ± 3.2 weeks, 1691.9 ± 593.9 g, 40.2 ± 5.2 cm], and 30 full term infants (50% boys), [mean GA 39.3 ± 1.0 weeks, 3131.0 ± 390.0 g, and 49.38 ± 2.0 cm] were enrolled in the study. At 6 and 24 months, 65.2% premature infants had a narrow hard palate (NHP). At 24 months, 79% had an apnea–hypopnea- index (AHI) > 1 events/hour at PSG, with a mean AHI of 3.00 ± 2.95 . Only 10% of full term infants had NHP at birth and the mean AHI was 0.5 ± 0.2 event/hour at 24 months.

Conclusion

Preterm infants have a higher occurrence of NHP at birth. At two years of age they have more sleep problems, most commonly associated with obstructive-SDB, and a higher rate of [development delays](#). Frequency of NHP is still abnormally high, suggesting not only abnormal orofacial growth over-time, but also impact of this abnormal growth in the genesis of the obstructive-SDB.

Keywords

Prematurity

Sleep-disordered breathing

Neuro-development

Cranio-facial growth

Narrow hard palate