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Obstructive Sleep Apnea is position dependent in young infants

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Background: We have studied the sleep position dependency of obstructive sleep Apnea in infants.

Methods: We re-evaluated ten-year single pediatric national reference sleep center data in infants aged less than six months, with Polysomnography (PSG) performed in supine and side sleep positions. Three major groups were identified: 1) 67 infants with Pierre Robin sequence, 2) 28 infants with laryngomalacia, and 3) 72 infants without any known syndromes, genetic defects, or structural anomalies. Of these 72 infants, 24 (33%) were born prematurely, 10 (14%) have had a Brief Resolved Unexplained Event (BRUE), 8 (11%) have had a more severe Apparent Life-Threatening Event (ALTE) with subsequent resuscitation, and 8 (11%) were studied because of being a sibling of infant who had succumb do Sudden Infant Death Syndrome (SIDS). In most cases, PSG recording included one cycle of NREM and REM sleep in both sleeping positions.

Results: Comparison of breathing between supine and side sleeping positions was performed in PRS group at the median corrected age of 4 weeks (interquartile range (IQR) 3-6), laryngomalacia 7 weeks (IQR 5-12), and in group 3 at 4 weeks (IQR 2 – 8). Obstructive upper airway events were more frequent in all three groups of infants in the supine than in the side sleeping position: PRS 31 h-1 (IQR9 - 69) vs 16 h-1 (IQR 4 -41) ($p = 0.007$), laryngomalacia 15 h-1 (IQR 5 - 26) vs 5 h-1 (IQR 1-18) ($p = 0.005$), and Group 3 8 h-1 (IQR 4-20) vs 4 h-1 (IQR 0-10) ($p < 0.001$). In all three groups, breathing was also less laborious ($p = 0.01$) and end-tidal carbon dioxide level (EtCO₂) lower in the side than in the supine sleeping position.

Conclusions: Obstructive upper airway events in young infants are more frequent when supine than when sleeping on the side.

Recent publications

1. Obstructive sleep apnea in young infants: Sleep position dependence and spontaneous improvement. Kukkola, H-L. & Kirjavainen, T., Mar 2023, In: Pediatric Pulmonology. 58, 3, p. 794-803 10 p.
2. Caffeine is a respiratory stimulant without effect on sleep in the short-term in late-preterm infants. Seppä-Moilanen, M., Andersson, S. & Kirjavainen, T., Sep 2022, In: Pediatric Research. 92, p. 776–782 7 p.
3. Finnish children who experienced narcolepsy after receiving the Pandemrix vaccine during the 2009-2010 H1N1 pandemic demonstrated high level of psychosocial problems. Hovi, M., Heiskala, H., Aronen, E. T., Saarenpää-Heikkilä, O., Olsen, P., Nokelainen, P. & Kirjavainen, T., Apr 2022, In: Acta Paediatrica. 111, 4, p. 850-858 9 p.

Biography

Kirjavainen Turkka has completed his PhD at the age of 26 years after working in Sydney under supervision of Colin Sullivan, the inventor of CPAP treatment of obstructive sleep Apnea. He is a Neonatologist and Pediatric Pulmonologist, and he has been a head of Pediatric Pulmonology and sleep laboratory team at New Children's Hospital, Helsinki, Finland since 2009.

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