

## **Long-Term Effects Of Caffeine Therapy For Apnea Of Prematurity On Sleep**

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### Introduction

Apnea of prematurity is a common condition that is usually treated with caffeine. Caffeine is an adenosine receptor blocker that has powerful influences on the central nervous system. However, little is known about the long-term effects of caffeine on sleep in the developing brain. In particular, it is not known whether neonatal caffeine administration has permanent adverse effects on sleep architecture and ventilatory control, resulting in an increased prevalence of sleep disorders such as insomnia and obstructive sleep apnea. We hypothesized that neonatal caffeine use resulted in long-term abnormalities in sleep architecture and breathing during sleep.

### Methods

201 ex-premature (500-1,250 gm) children aged 5-12 years who participated as neonates in a double-blind, randomized clinical trial (Caffeine for Apnea of Prematurity [CAP]) of caffeine versus placebo underwent sleep questionnaires, actigraphy and full ambulatory polysomnography.

### Results

There were no significant differences in sleep quality or quantity based on actigraphy and questionnaires between the caffeine group vs placebo. Total recording time and total sleep time on polysomnography were longer in the caffeine group, but there was no difference in sleep efficiency between groups. Obstructive sleep apnea (apnea hypopnea index >2/hr) was common (8.2% of caffeine group vs 11.0% of placebo) compared to normative literature. Further, 24% of the caffeine and 29% of the placebo group had either obstructive sleep apnea on polysomnography and/or a history of adenoidectomy/tonsillectomy. However, neither the apnea hypopnea index nor the proportion of children with obstructive sleep apnea differed between groups. The proportion of subjects with elevated periodic limb movements was high (17.5% in caffeine vs 11% in placebo) but did not differ significantly between groups.

### Conclusions

Therapeutic neonatal caffeine administration has no long-term effects on sleep pathology during childhood. However, preterm infants are at risk for obstructive sleep apnea and periodic limb movements in later childhood.

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