



UPDATE

NASAL CPAP REVERSES SLEEP-RELATED HEMODYNAMIC ABNORMALITIES IN PREECLAMPISA

Preeclampsia occurs in 7% of pregnancies and is a threat to both the mother and the fetus. The underlying cause is unknown. While systemic HTN is the hallmark of this condition, the reduced maternal cardiac output is thought to be particularly detrimental to fetal growth. A recent report showing that nocturnal nasal CPAP treatment reverses these and other hemodynamic abnormalities during sleep supports a proximate causative role of partial upper airway obstruction. The 24 women studied had no prior history of hypertension or cardiac abnormalities. They were randomly assigned to receive either CPAP or no treatment following a baseline night of full polysomnography.

During baseline polysomnography, all preeclamptic subjects exhibited upper airway flow limitation, a subtle form of upper airway obstruction, in addition to a mildly elevated apnea/hypopnea index. They also showed a sleep-related drop in cardiac output of about 2.2 liters per minute compared to waking daytime values. CPAP treatment on a subsequent night prevented this drop.

During wakefulness, blood pressure was higher in all preeclampsia subjects than in control pregnant women. During baseline sleep, mean arterial pressure decreased in sleep by a mean of 9mmHg in control subjects, whereas it actually increased in preeclamptics sleep by an average of 3-6 mmHg. Treating preeclamptics with nocturnal CPAP for one night caused mean arterial pressure to actually decrease by 3 mmHg. CPAP also normalized or nearly normalized the slower heart rates, decreased stroke volumes, prolonged ejection times and increased total peripheral resistances seen in preeclamptics during baseline sleep.

The hemodynamic abnormalities associated with preeclampsia are amplified during sleep and can be reversed with nocturnal nasal CPAP. The clinical importance of these results is underscored by the fact that fetal birth weight showed a strong correlation with maternal cardiac output. Such findings (1) argue for a proximate role of subtle forms of upper airway obstruction in hemodynamic manifestations of preeclampsia, and (2) suggest that CPAP can play a vital role in protecting maternal and fetal well-being.

If you would like a copy of this article, contact the Sleep Disorders Center at (714) 771-8950.

Raymond J. Casciari, M.D.

Medical Director, Sleep Disorders Center

Sarah Mosko, Ph.D.

Associate Medical Director, Sleep Disorders Center

[1] Blyton, D.M., et al. Reduced nocturnal cardiac output associated with preeclampsia is minimized with the use of nocturnal nasal CPAP. *Sleep*, 2004; 27:79-84.