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Title: Progesterone may play a protective role in the pathogenesis of SDB in pregnancy

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Body: Introduction: Sleep disordered breathing (SDB) is common in the pregnant population. Progesterone stimulates the ventilatory drive and enhances the responsiveness of the upper airway dilator muscles during sleep, theoretically protecting against SDB. On the other hand, by increasing the negative inspiratory pressure, progesterone may cause collapse of the edematous upper airway in this population. We hypothesized that pregnant women with obstructive sleep apnea (OSA) may have altered levels of progesterone. Methods: We conducted a retrospective case-control study comparing second trimester progesterone between pregnant OSA cases (n=22) and pregnant controls at low risk for OSA (n=66). Cases were identified using an ICD-9 code; Controls were identified from a convenience sample screened for symptoms of SDB at delivery. Levels of progesterone and HCG were determined using the automated Immulite 2000 immunoassay. Results: Mean age was similar in cases and controls (28.6 + 6.2 vs. 27.3 + 6.4, p=0.4). Mean body mass index (BMI) was 41.8 +8.3 in cases vs. 30.5 + 5.0 in controls, p<0.0001. There was a significant negative correlation between BMI and progesterone (r=-0.2, p=0.03). Mean progesterone levels were adjusted for BMI and gestational age (multiples of medians) and were lower in cases compared to controls (1.0 +/- .17 vs. 1.01 +/- 0.15, p=0.02) even after adjusting for preeclampsia. Conclusion: Progesterone levels are lower in OSA cases compared to low risk controls, even after adjusting for confounders. Progesterone likely plays a protective role against the development of SDB. Conditions such as obesity may possibly predispose to SDB through lower levels of progesterone.