Sleep Breath (2013) 17:1125–1126
DOI 10.1007/s11325-013-0821-8

EDITORIAL(INVITED)

Epworth Sleepiness Scale scores and adverse pregnancy outcomes

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Received: 8 January 2013 / Revised: 21 January 2013 / Accepted: 31 January 2013 / Published online: 13 March 2013

Sleep disturbances generally increase with the onset of pregnancy and continue to increase in frequency as pregnancy progresses [1–4]. Although these disturbances may arise as a consequence of numerous physiologic and hormonal changes accompanying pregnancy, it is important for clinicians to consider the possible presence of primary sleep-related breathing disorders (SRBD), such as snoring and sleep apnea [5]. Sleep apnea, snoring, and excessive sleepiness are identified as the most frequently sleep disturbances among pregnant women. There is conflictive evidence in regard to whether sleep-disordered breathing increases in prevalence during pregnancy, but existing research indicates that such disorders may enhance the risk of potentially adverse maternal–fetal outcomes by increasing the likelihood of preterm birth, preeclampsia, and gestational diabetes [6].

In this issue of *Sleep and Breathing*, Ghada Bourjeily and colleagues of The Warren Alpert Medical School of Brown University in their paper "Epworth Sleepiness Scale scores and adverse pregnancy outcomes" tried to investigate whether excessive daytime sleepiness (EDS) in snorers and non-snorers contributed to adverse pregnancy outcomes such as gestational hypertensive disorders, gestational diabetes, or mode of delivery. The authors found that there is an increased association between pregnant women with higher Epworth Sleepiness Scale (ESS) score and planned caesarean delivery. Although retrospective, this study extends previous observations that EDS and snoring are risk factors for gestational diabetes by showing that when higher cut off values of ESS were used, the risk of gestational diabetes was significantly elevated and sevenfold higher than women below the cutoff point, even after adjusting for confounders. However, in this study, neither gestational diabetes nor hypertensive disorder was associated with EDS, when EDS was defined as an ESS >10.

In the literature, studies that address SRBD in pregnant women are scarce with the only available data come from case studies, case series, small cohort studies, and a few small longitudinal studies. As no large population-based epidemiological studies have been performed, the prevalence of obstructive sleep apnea in pregnant women is not known. Previously, the same authors found that snoring, gasping, and apneas, all three symptoms of SRBD, were associated with higher mean ESS scores [7]. Furthermore, they found that these symptoms are common in pregnancy and associated with a higher likelihood of gestational hypertensive disorders, gestational diabetes, and unplanned caesarean deliveries [8]. The question, therefore, that arises is whether EDS assessed by ESS increases the risk of adverse pregnancy outcomes. In this new study, Bourjeily et al. attempted to answer this question. However, the fact that their major findings were that EDS was not associated with adverse pregnancy outcomes both in snorers and in non-snorers but severe EDS (ESS >16) increases the risk of gestational diabetes is still not clear. Although the authors mentioned the small sample size of the subgroups (ESS >16) as a limitation, it seems not enough to reach their conclusion that severe EDS is risky with this small sample size.

The main limitation of this study was the retrospective nature of the study leading to the possibility of recall bias. Furthermore, as the authors explain, another major limitation of this study is its questionnaire-based character and the lack of objective assessment of snoring and daytime sleepiness using more objective techniques such as polysomnography and MSLT. In addition, although the ESS questionnaire the authors used to estimate EDS has been validated outside of

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pregnancy, it has not been specifically studied in pregnant women. However, there is no validated questionnaire for sleep disorders in pregnancy. In a recent study, Facco et al. tried to evaluate the Berlin and ESS questionnaires in pregnancy and determine whether an alternative screening approach could better detect sleep apnea in pregnant women [9]. They found that the above questionnaires are not appropriate tools to screen for sleep apnea in high-risk pregnant women, but their four-variable model, incorporating frequent snoring, chronic hypertension, age, and body mass index, more accurately predicted sleep apnea in pregnancy.

What are the clinical implications of their findings? As the authors mention, until the influence of snoring and EDS in normal and complicated pregnancies is defined, pregnant women with excessive daytime sleepiness and loud snoring probably should be evaluated for sleep apnea with overnight polysomnography [1]. There is no evidence suggesting that overnight polysomnographic studies are difficult to perform in pregnant women as multiple studies have successfully performed PSGs in pregnant women without difficulty [10–13]. Moreover, as the disease remains underdiagnosed, not only in the general population, but likely also in pregnancy, it is a unique opportunity to screen women at risk or with unrecognized sleep disorders because pregnancy is often the only time that a woman of childbearing age might encounter a health care provider. Therefore, the diagnosis could me made years prior to the development of the full-blown complications of untreated obstructive sleep apnea.

In conclusion, existing research points to the potentially harmful effects of SRBD on obstetric outcomes. Health care providers should be encouraged to discuss sleep concerns with their pregnant patients, as complaints are common and certainly may impact adverse pregnancy outcomes. Further studies are needed to elucidate the nature and strength of the relationship between SRBD and obstetrics outcomes as well as to evaluate the impact of treatment of sleep disorders during pregnancy on all the diverse pregnancy outcomes.

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