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COMMENTARY

Women's Sleep Across the Reproductive Life Span

Commentary on Izci-Balserak et al. Changes in sleep characteristics and breathing parameters during sleep in early and late pregnancy. *J Clin Sleep Med*. 2018;14(7)1161–1168 and Jones et al. Sleep disturbances in midlife women at the cusp of the menopausal transition. *J Clin Sleep Med*. 2018;14(7):1127–1133.

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Women are more likely than men to report poor sleep.[1] Vulnerability to sleep disturbance appears to be exacerbated at certain times of the reproductive life span, including during pregnancy and the menopausal transition.

What accounts for worsened sleep during pregnancy and menopause? A recent meta-analysis showed that nearly half of all pregnant women have poor sleep quality as captured by the Pittsburgh Sleep Quality Index (PSQI) and that sleep quality progressively worsens throughout pregnancy due to insomnia, frequent urination, and nocturnal awakenings.[2] The overwhelming majority of pregnant women report sleep disturbances in the third trimester when physical discomforts related to the growing fetus and the prevalence of nocturia peaks.[3]

At the other end of the reproductive life span, the menopausal transition is associated with increased sleep difficulty, independent of older age.[4] Nearly half of all menopausal women report sleep disruption related to frequent awakenings, nocturia, and vasomotor symptoms including hot flashes and night sweats.[5] It can be difficult to sort out the degree to which menopausal sleep problems are explained by changes related to increasing age, hormonally mediated factors, or increasing medical comorbidities such as depression and sleep-disordered breathing.

In spite of "common knowledge" that sleep disturbances worsen at these times, women report being infrequently asked about sleep quality by their health care providers. For example, fewer than half of pregnant women reported being questioned about the quality of their sleep in one study.[6]

Disturbed sleep in pregnancy may have consequences for both mothers and their offspring.[7] Poor sleep quality in the prenatal period has been associated with an increased risk of gestational diabetes as well as symptoms of depression in the postpartum period.[8,9] Sleep disruption may portend a higher risk of preterm birth, particularly in African-American women, perhaps due to a higher inflammatory response to poor sleep.[10] Similarly, disturbed sleep in menopause may impact mental health; hot flashes are strongly associated with symptoms of depression[11] and women experiencing hot flashes are more likely to develop a major depressive episode.[12]

Two articles in this issue of the *Journal of Clinical Sleep Medicine* further our understanding of the sleep alterations that accompany these major life transitions in women. Izci-Balserak and colleagues performed a prospective analysis of 123 predominantly African-American women with singleton pregnancies who underwent polysomnography in the first trimester and third trimester.[13] Not surprisingly, women's sleep worsened as pregnancy progressed, with shorter sleep duration, poorer sleep efficiency, more awakenings, more stage N2 sleep, less slow wave and rapid eye movement sleep, higher apnea-hypopnea index and higher periodic limb movement indices in late as compared to early pregnancy. Power spectral analysis of the electroencephalography in non-rapid eye movement sleep showed a reduction in delta and theta powers during pregnancy as well as an association between decreased delta power and elevations in apnea-hypopnea index; though the implications of this particular finding are not immediately evident, they may provoke further exploration of spectral analysis as a tool for characterizing sleep in this population. The authors are to be commended on successfully obtaining longitudinal, objective, polysomnography-based data on such a large sample size of pregnant women. Prior large observational studies have been largely based on self-report; this is one of the largest studies examining changes in sleep architecture across the span of pregnancy.

The study by Jones and colleagues sought to characterize the dynamics of sleep duration and disturbance among women passing through menopause.[14] They closely followed 347 premenopausal women with symptom diaries, the PSQI and follicle stimulating hormone (FSH) levels, which rise during menopause. Among the 20% of their sample who passed through menopause during the five-year study period, some important conclusions emerged. Nocturnal awakenings were common in both groups, but premenopausal women were more likely to attribute awakenings to nocturia, while perimenopausal women were more likely to cite feeling too hot as a cause. Their findings would have been strengthened by knowing how much underlying sleep-disordered breathing was responsible for the associations seen, since sleep apnea itself is associated with both elevated body mass index and nocturnal awakenings, and

is present in half of women in the perimenopausal age group.[15] As noted by the authors, data were further limited by their reliance on self-reported sleep duration—which is biased by systematic over-reporting[16]—and the inability to assess for the presence of depressive symptoms, which relate strongly to the presence of poor sleep during menopause.[17] Their work nonetheless highlights the importance of conceptualizing the menopausal transition as a dynamic process with changing sleep patterns at different stages.

An abundance of data has confirmed what many of us thought we knew already—that sleep disturbance in pregnancy and menopause is common. We have identified several reasons for disturbed sleep at these times in women's lives. It is now time to take the next step: identifying those sleep disturbances most predictive of adverse outcomes for expectant mothers, their offspring and perimenopausal women. The phenotypic approach that is gaining widespread attention in the domain of sleep apnea also offers a helpful framework for studying sleep in women. Our goal should be to separate the milder and more transient elements of sleep disruption so common to pregnancy and menopause from those with the greatest potential consequence. Such an approach would guide us to identify the highest-risk cases most deserving of our attention and resources. For example, a recent study showed that afternoon napping during late pregnancy may reduce the risk of low birth weight infants[18] illuminating an inexpensive and practical suggestion that could be incorporated into prenatal counseling. Furthermore, we should equip those on the "front lines" of women's sleep health—primary care providers and obstetricians—with the tools to better elicit sleep symptoms, to refer for appropriate testing when indicated, and to understand when to seek care from sleep specialists.

CITATION

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