

Chapter: 11

SLEEP in WOMEN: ARE THERE GENDER DIFFERENCES?

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Sleep is an essential function for physiologic and psychological restitution. Sleep deprivation can result in decreased cognition, altered thermoregulation, impaired immune function, and altered respiratory mechanics, excessive daytime sleepiness, fatigue, and can exacerbate symptoms of depression. Sleep architecture changes over the life span of an individual, but differently between the genders. Additionally, women and men differ in the problems each experience with their sleep. What and how are these differences, as well as the effect of the hormonal milieu will be discussed.

Overview

Studies with polysomnography demonstrate that young women have better sleep quality than men. They have more rapid sleep onset and better sleep efficiency (time asleep). As people age, there is an increase in stage 1 and 2 sleep. SWS declines in both men and women, but decreases more so in men. Men tend to sleep less than women. But importantly, men function better than women with less sleep (Sorry Ladies). Additionally, across all age spans, females have more sleep complaints than males do. They complain of inadequate time to sleep, non-refreshing sleep, and difficulty with falling and staying asleep. This suggests that girls/women may be more sensitive to clinical symptoms or report symptoms more readily than boys/men.

The Influence of Hormones

One of the major factors influencing women's sleep is hormonal changes across the life span. Sleep in pre-adolescence is not different between the genders. However, in puberty changes begin to emerge. Coincident with menarche, girls begin to complain of insufficient sleep and trouble staying asleep with increased early morning awakenings. This can lead to daytime fatigue, mood changes, and impact learning in school. Girls report more stress during this time and teenage girls are diagnosed more often and earlier with affective disorders.

The changes in hormones that occur over a normal menstrual cycle influence sleep quality in young women. The menstrual cycle is divided into two phases: the follicular phase, from the onset of menses (consider day 1 of the cycle) until the LH surge; and the luteal phase, from the peak of the LH surge until the next menses. During the follicular phase, estrogen levels increase and peak; then FSH and LH peak with ovulation and the luteal phase begins with a rapid drop in estrogen followed by a rise in progesterone and again estrogen. Pre-menstrual mood changes can occur, increased fatigue and during the follicular phase hypersomnia may also be present. During the luteal phase, insomnia related symptoms are more common.

Menopause is associated with many subjective complaints that may disturb sleep: insomnia increases, increased depression and anxiety, OSA, and increased restless leg syndrome (RLS). Using single-night polysomnography (PSG), the Wisconsin Sleep

Study (12) identified that PSG was inconsistent with women’s subjective symptoms. Postmenopausal women had deeper sleep and longer total sleep time (TST) than premenopausal women; however, peri-and postmenopausal women were less satisfied with their sleep, particularly sleep initiation.

Often vasomotor symptoms are attributed to causing the sleep disruption. Late peri-menopausal and African-American women complain the most of vasomotor symptoms. Vasomotor symptoms were not substantially correlated with subjective sleep quality and several studies have shown no substantial improvement with hormone therapy. When multivariate analysis performed, only severe hot flashes were associated with insomnia, not menopausal status. Age was also associated with chronic insomnia indicating that postmenopausal women are older and have more insomnia symptoms, but they may be related to co-morbid health conditions and presence of OSA. In the Study of Women Across the Nation (SWAN), the more rapid rate of FSH change over the peri-menopausal period was shown to be significantly associated with higher delta sleep percent, longer TST, but less favorable self-reported sleep quality (16). Women with higher testosterone or who were closer to the completion of the transition process had less sleep discontinuity.

Pregnancy

Changes due to hormones, as well as increasing gravid uterus create insomnia, sleep disruption, and daytime sleepiness. PSG confirms decreased SWS and REM. Progesterone directly causes sedating effect. Estrogen can cause mucosal edema, mucus hypersecretion, and increased upper airway resistance leading to snoring. OSA increases to 14% during pregnancy and is associated with intra-uterine growth retardation and pregnancy-induced hypertension. Restless leg syndrome also increases during pregnancy (15-20%) due to iron and folate deficiency.

Sleep Disorders and Gender

The prevalence and manifestations of sleep disorders are different between the sexes. Insomnia is a more common complaint associated with OSA in women than in men. Insomnia is more prevalent in women, where as OSA is more prevalent in men (until ~ age 60 yrs, then equal). Comparison of the following disorders will be discussed in lecture.

<u>Sex</u>	<u>Insomnia</u>	<u>SDB</u>	<u>Movement Disorder</u>	<u>Parasomnias</u>	<u>Other</u>
Female	All Types		RLS	Sleep enuresis in older; eating disorders; hallucinations	menstrual
Male		OSA; Central	RBD; PLMD	Enuresis in boys, sleep terrors	Narcolepsy

No Gender	Poor sleep hygiene			Sleep walking	Delayed phase; insufficient sleep
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