**Fluctuating** mood, irritability, low energy and poor sleep are symptoms commonly associated with premenstrual syndrome (PMS). While it is important to look at hormones when addressing PMS, symptoms can extend beyond a hormone imbalance necessitating a more global approach of neuroendocrine balancing. A perfect complement to hormone balancing, addressing neurotransmitter imbalances in PMS sufferers may be beneficial in alleviating their symptoms.

**The Answer To PMS?**

Why do some women have more severe PMS-associated mood swings than others? The answer may be in their neurotransmitter levels. The relationship between hormones and brain chemistry strongly influences the severity of symptoms women experience during their menstrual cycles. If optimal levels of neurotransmitters are not present due to decreased synthesis or increased consumption, their hormonal counterparts may not adequately modulate, enhance or sensitize their activity.

**Estrogen And Neurotransmitters**

Ovarian hormones, including progesterone and estrogen, heavily influence neurotransmitter activity and synthesis. Estrogen is the predominant hormone during the first half, or follicular phase, of the menstrual cycle with levels climbing until ovulation. **Estrogen increases production and synaptic concentration of serotonin as well as serotonin receptor levels.** Thus, this rise in estrogen allows for increased availability of serotonin – critical in maintaining a positive mood. This essential relationship between estrogen and serotonin succeeds only when the body’s production and store of serotonin is adequate.

In addition to being a serotonin agonist, **estrogen serves as a dopamine modulator, enhancing the activity of dopamine**, which is essential to cognition and motivational drive. Low levels of dopamine, in conjunction with low levels of serotonin, can negatively impact focus and cognition in addition to adversely influencing mood.

**Progesterone And Neurotransmitters**

The neuroendocrine connection to PMS extends beyond estrogen’s interaction with neurotransmitters, as progesterone is a key component of a healthy menstrual cycle. Progesterone ebbs and flows throughout a woman’s monthly cycle rising to peak levels after ovulation in the second half, or luteal phase, of the menstrual cycle. **Progesterone is a GABA agonist** and stimulates activity of this mood and anxiety-regulating neurotransmitter. Disruptions in GABA or progesterone levels may contribute to complaints of anxiety, worry, diminished sleep quality and more. Much of progesterone’s effect on neurotransmitters is mediated through its primary metabolite (allopregnanolone), which is a potent modulator of GABA receptors – the same target receptors as benzodiazapenes, such as Xanax. Just as estrogen’s relationship with serotonin succeeds only when the body’s production and store of serotonin is adequate, the essential relationship between progesterone and the inhibitory neurotransmitter GABA requires adequate production and storage of GABA. While estradiol, progesterone, serotonin and GABA are the primary considerations in the neuroendocrine connection to PMS they certainly aren’t the only players, necessitating a comprehensive evaluation of sex hormones, diurnal cortisols, and neurotransmitters.

Assessing and addressing neurotransmitter levels is a beneficial complement to hormone balancing when managing menstrual cycle symptoms. Simple, noninvasive urinary testing helps to identify the specific imbalances and may be ordered alone or in tandem with salivary hormones.

**References:**