

NUTRITION UPDATE

Scott D. Banks, D.C., M.S.

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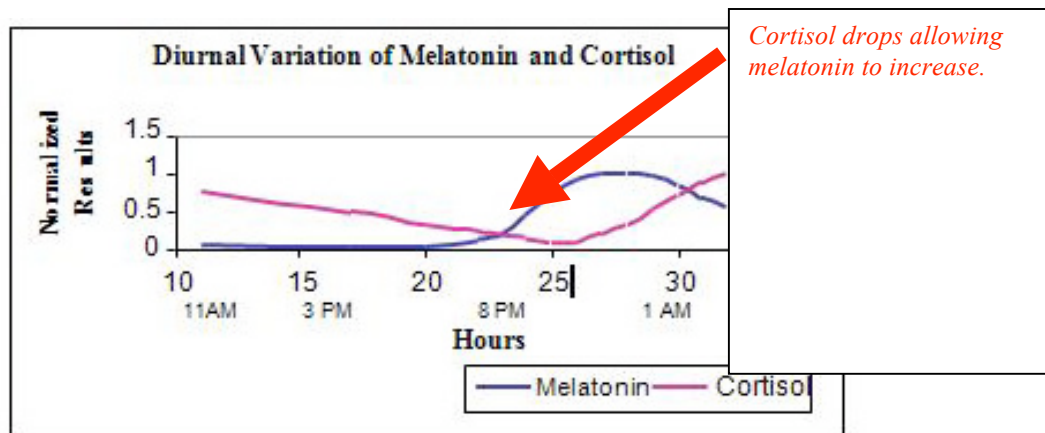
Sleep Difficulty

Sleep is initiated and maintained by a series of interactions of a group of chemicals in the body and brain. The group of chemicals that are involved in the sleep process are of two different types; hormones and neurotransmitters. The levels of these chemicals vary in a predictable pattern or rhythm over a 24-hour period called the "circadian rhythm".

One of the most important hormones in the sleep cycle is melatonin. Melatonin is made in the pineal gland which is in the center of the brain. Melatonin is very important in initiating sleep, and its circulating level increases shortly before sleep begins. The important stimuli to the pineal gland to

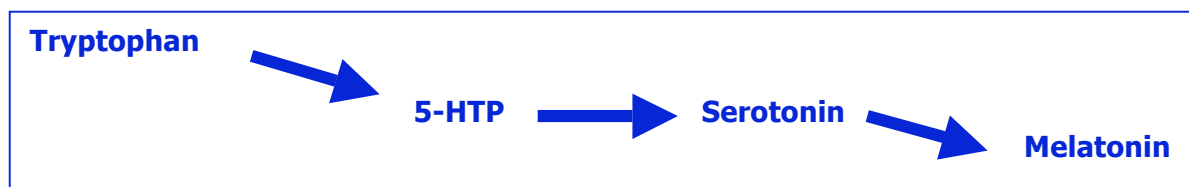
produce melatonin is darkness which is signaled from the retina of the eye to the brain and then to the pineal gland. However, even when the proper stimulus to the brain for melatonin production occurs, the release and activity of melatonin can be diminished by other hormones such as cortisol.

Melatonin and the hormone cortisol increase and decrease in opposite cycles in the circadian rhythm. Cortisol is made in the adrenal glands and activates the body in response to stress, low blood sugar and other factors. In many ways, cortisol is the "wake up" hormone, while melatonin is the "rest" hormone.



A very important sequence that must occur to allow the sleep cycle to be initiated is the reduction of circulating cortisol levels which allow the elevation of melatonin. Either inadequate melatonin production, or high cortisol levels later in the day suppressing melatonin release may be involved in sleep difficulty.

Inadequate melatonin production may be related to the dietary level of certain amino acids and their conversion into neurotransmitters in the brain. The amino acid tryptophan is used to make the neurotransmitter serotonin which in turn is made into melatonin as it is needed.



Some people have difficulty in converting tryptophan into the active form in the brain (5-HTP). They may have to take supplemental 5-HTP which is already in the active form for the brain to use. Some people will benefit directly from melatonin supplements, but this is variable and changes over time.

If the melatonin production pathway is functioning properly and sleep difficulty is occurring, the problem is more likely in the cortisol pathway. Because cortisol is involved in many "alert" activities in the body, several circumstances can elevate cortisol levels and suppress the melatonin pathway. These circumstances may include blood sugar regulation, imbalances in the other hormones called steroids which are in the same family as cortisol, pain responses and several others.

One particular cause of cortisol imbalance is an excessive drop in blood sugar during the night. As high amounts of cortisol are released to signal mechanisms to raise the blood sugar, abnormal awakening often

occurs during this period. This problem requires some unique steps to prevent excessive drops in overnight blood sugar. Isolating the problem in the cortisol pathway requires looking at a broader number of issues often with laboratory testing. The good news is that the problem can be typically isolated and balanced with nutritional factors, herbs and diet resulting in normalization of cortisol levels.

Sleep disturbance is not just an annoyance but rather it is a serious risk factor for a wide variety of diseases including heart disease, diabetes, osteoporosis, depression, weight management issues, cancer risk and immune function. It is uncertain if the inadequate sleep predisposes to these disease risks or if other factors such as poor diet cause the increased risk as well as the hormonal balances above. All that is known at this point is that restoration of the normal sleep cycle appears to have broad preventative benefits.

Care should be taken to isolate the actual causes of the sleep disruption. Sometimes just trying something such as taking melatonin may work for a while but then the problem returns worse than ever. This is the result of disrupting the bodies

“feedback mechanisms” which react to and adjust all chemical levels. Fortunately, the various causes of sleep disturbance can be determined with an orderly process of testing resulting in focused therapy which naturally restores proper sleep.

Banks Chiropractic & Nutrition

Dr. Scott D. Banks
117 Mason Avenue
Cape Charles, VA 23310
Phone: 757-331-1190 Fax: 757-331-1260