

Melatonin Plays an Important Role in Healthy Digestive and Immune Function

By Dr. David Jockers, Natural News

Melatonin is known as the regulator of the sleep wake cycle in the body. It is produced in the pineal gland of the brain and monitors sleep cycles while playing an important role in healing and anti-oxidant protection. New indicators are showing that it may play an even more important regulatory role in the digestive system.

The human digestive system is considered by many experts to be the '2nd Brain,' due to its ability to produce neurotransmitters. Additionally, the digestive system works off of similar rhythmic patterns as brain waves and has an advanced communication network that rivals that of the brain. The hormone melatonin appears to play a very important role in regulating much of these patterns in both the brain and gut.

The amount of melatonin in the digestive system is 400 fold greater than the pineal gland. Melatonin is produced in specialized cells called enteroendocrine cells of the gastrointestinal tract. This super hormone is present in all segments of the gastrointestinal tract as well as the pancreas & liver.

The mucosal membranes of the gut are packed with microbes. Most of these have a symbiotic relationship with the host individual. This inner world of thriving bacteria exudes endotoxins throughout the day. When the level of endotoxins reaches a critical mass concentration, it triggers an immune response led by cytokine interleukin-2. Sleep is thought to be that immune response.

This sleep cycle begins with the production of melatonin from the pineal gland. In the middle of the night, the hormone prolactin is secreted in large amounts. These two hormones promote an immune reaction that thins out the microflora in an attempt to restore a healthy balance. This process also targets viruses, pathogenic bacteria, man-made chemicals and foreign proteins in the body.

This entire cycle lasts 8 hours in order for the necessary amount of melatonin and prolactin production to occur. With inadequate sleep, these hormones are unable to effectively enhance immunity enough to clean up the microflora and other toxic debris in the gastrointestinal system. Each night of poor sleep cripples the immune system and leads to disabled T cell and natural killer cell formation.

Within the gut, melatonin is an important regulator of motility and inflammation. It modulates inflammation with its ability to control free-radicals and proinflammatory molecules through its powerful anti-oxidant function. Additionally, it influences intestinal bacteria and T-helper cell formation. Healthy gut bacteria and T-helper cells help to balance the immune system and to regulate inflammatory levels.

Melatonin is known to help improve microcirculation throughout the gut which helps foster epithelial regeneration. Additionally, it preserves glutathione levels and prevents lysosomal enzyme disruption. This is especially important because increased inflammatory levels in the bowel lead to leaky gut syndrome, inflammatory bowel disease (IBD), ulcerative colitis, auto-immunity, etc.

When we sleep, the brain produces 90 minute cycles of slow wave sleep. This is then followed by periods of rapid eye movement (REM) during which dreams occur. During the night, the gut also produces 90 minute slow wave muscle contractions which are followed by short burst of rapid movement. When the gut is full at night, it can disrupt this process. Additionally, poor sleep cycles can dramatically affect digestive function and the healing process within the gut.

Melatonin was shown to significantly reduce the degree of proinflammatory cytokine release, cell apoptosis, and overall colonic injury. This is due to the improved blood flow, immunomodulation and anti-oxidant effects. It is clear that sleep and digestive function have a very intimate relationship and confer this relationship into the overall function of the immune system.