Bad news for insomniacs: 'hunger hormones' affected by poor sleep

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Insomnia has long been associated with poor health, including weight gain and even obesity. Now researchers at UCLA have found out why.

In a study to be published in the May issue of the journal *Psychoneuroendocrinology* and currently available online by subscription, Sarosh Motivala, an assistant professor of psychiatry at the Semel Institute for Neuroscience and Human Behavior at UCLA, and colleagues looked at two hormones that are primarily responsible for regulating the body's energy balance, telling the body when it is hungry and when it is full. The study found that chronic insomnia disrupts one of these two hormones.

To date, no study has evaluated nocturnal levels of the two hormones, ghrelin and leptin, in primary insomnia patients. Ghrelin, a peptide secreted by the stomach, stimulates appetite and increases before meals. Leptin, which affects body weight and is secreted primarily by fat cells, signals the hypothalamus regarding the degree of fat storage in the body; decreased leptin tells the body there is a calorie shortage and promotes hunger, while increased levels promote energy expenditure.

In the study, researchers compared healthy sleepers with those suffering from chronic insomnia and measured the levels of the two hormones at various times throughout the night. They found that while leptin levels averaged out over the night to be roughly the same between the two groups, levels of ghrelin were 30 percent lower in insomnia sufferers.

On the face of it, a decreased level of ghrelin would seem to inhibit weight gain; it is an increase in ghrelin, after all, that stimulates appetite. But Motivala compared his findings with other, earlier studies on sleep deprivation and speculates that a switch may occur during the day: Sleep loss leads to increased ghrelin and decreased leptin, a "double whammy" that stimulates appetite. Motivala is currently working on a study to examine this switch.

"The current study shows that insomnia patients have a dysregulation in energy balance that could explain why these patients gain weight over time," said Motivala, who is also a member of the Cousins Center for Psychoneuroimmunology at UCLA. "This is an exciting finding because it highlights how diverse behaviors like sleep and eating are connected. We are just beginning to explore the possible consequences of these connections, but it is another example of the importance of a good night's sleep for the body."

For the study, 38 male participants were divided into two groups — 14 insomnia sufferers and 24 healthy subjects. Both groups had similar ages and body weight. Both groups underwent polysomnography sleep studies that monitor brain waves. Circulating levels of ghrelin and leptin were measured at 11 p.m., 2 a.m. and 6 a.m. Ghrelin levels across the night were significantly lower in insomnia patients, while leptin were not significantly different between the two groups.

Source: University of California - Los Angeles