Circadian Rhythms and Body Physiology

Most of the physiological processes in the body are cyclic and under the influence of circadian rhythms controlled by the internal clock system.

a) ***Energy metabolism.*** During daylight, the body is expected to be physically active, so there is an enhanced need for energy. Glucose is the primary source of energy for body cells. That means the body uses up glucose more efficiently for making energy during the day time. The hormone which moves glucose into cells for producing energy is insulin, so the body is more sensitive to insulin during the daytime. During the night, the body is physically inactive and does not require much energy from glucose, so it becomes insulin-resistant. Therefore, the glucose absorbed from a meal eaten late at night does not get used for making immediate energy for activity. Instead, it gets converted into the reserve energy as fat. For this reason, a meal consumed late at night will invariably lead to obesity, even if one were to eat the healthiest holistic meal.

Therefore, for keeping a lean and disease-free body, when to eat is as critical as what to eat.

b) ***Hunger and Satiation***. No one gets hungry at night when they are sleeping. However, staying up late at night causes intense food cravings and overeating. The perception of being awake is a signal to the body that energy is needed. Typically, the food craving at night is for sugary foods to get instant energy. Late eaters usually, end up consuming convenient, readily available sugary junk foods and are likely to suffer from obesity, and associated diseases.

c) ***Cellular repair is cyclic in harmony with the natural circadian cycle.*** During the daylight hours, the cells are actively working to produce energy for survival and growth. The night time is for rest, repair, and rejuvenation. The digestive tract, which gets overworked for 14-15 hours from frequent meals or meals eaten late into the night, suffers from acid reflux disease, indigestion, bloating, and gas because there is no time for rest, repair, and rejuvenation. Once an individual adopts two or three meals a day routine with no food after 8 PM, all these problems disappear.

d) ***Hormonal balance is circadian.*** The hormones in the body rise and fall with circadian rhythms of the brain clock in response to the natural light and dark cues. The release of several essential hormones in the body is in synchrony with the Sleep-Wake cycle. Activation of brain clock by morning light sends the signal to the hypothalamus to release stimulating factors for all the essential hormones needed by the body:

- Insulin (glucose utilization hormone). As explained above, the body is sensitive to insulin during the daylight hours and resistant during the night.
- Cortisol-stimulating hormone
- Thyroid-stimulating hormone- Hypothyroidism has become an epidemic amongst city dwellers because of the disruption of natural circadian rhythms and unhealthy foods.
- Growth hormone. Deep rejuvenating sleep is critical to the optimal level of growth hormone in the body. The children who need more growth hormone get profound sleep and are hard to wake up.

- Melatonin. The brain clock on exposure to sunlight or bright daylight sends the signal to the pineal gland (the third eye) to synthesize and store the sleep hormone melatonin. It then gets released during the darkness of night to bring about deep, rejuvenating sleep. The artificial bright light and blue light from the digital screens at night inhibit the regular release of melatonin from the pineal gland at the dark hours of the night.

Harmony with the body's internal clock system and its circadian rhythms is critical to normal body physiology to ensure the preservation of health and prevention of disease.