One hour extra sleep may decrease type 2 diabetes risk

17 February 2016

A team of researchers from Université Libre de Bruxelles in Brussels, Belgium, have investigated whether the increase of one hour of sleep, in people who normally sleep less than seven hours, resulted in a lower risk of developing diabetes. Indeed, an hour of extra sleep had positive effects on several markers that indicate diabetes risk, including insulin and glucose levels and insulin sensitivity.

Previous studies have found that a lack of sleep decreases the body’s sensitivity to the hormone insulin, which supports the uptake of blood glucose to body cells. An overnight sleep of less than five hours is associated with an increased insulin production, without the body’s cells using it effectively to lower glucose concentration. This condition is also referred to as insulin resistance and is potentially the beginning of developing type 2 diabetes. Over the past few decades people’s average sleep duration across countries has significantly decreased.

In the current study sixteen healthy volunteers between 20 - 50 years old were selected to participate. They normally slept less than 7 hours per night, were not particular morning or evening types, and were not night workers. They were given instructions to extend their sleep time by an hour, scheduled individually according to the subjects own lifestyle. Participants were given information on how to achieve a sound sleep and taught the harmful effects of insufficient sleep on behaviour and performance, so as to encourage the participants to stick to the instructions.

Data on sleep times were recorded by a wrist activity monitor, along with an activity log where the subjects documented the times they fell asleep and woke up. A recording of brain waves, eye movements and skeletal muscle stimulation during sleep was made before and after the intervention, to give information on sleep quality and depth. Tests for fasting (i.e. after a night of sleep, before breakfast) insulin and glucose levels were also taken before and after intervention.

The average increase in self-reported sleeping time was one hour, 6.5 hours on weekdays and 7.7 hours on weekends. These numbers were confirmed by the wrist activity monitoring data. Moreover, the participants reported a better sleep quality and an increase in dreaming.

The researchers observed a significant association between the changes in sleep time and the fasting levels of glucose and insulin. More sleep resulted in a higher level of both glucose and insulin, and a smaller insulin-to-glucose ratio, which implies a potential reduction in the risk of type 2 diabetes.

In previous studies, the authors note, where larger increases in sleep time were applied, the participants’ quality of sleep declined rather than improved. Also, too much time in bed (more than 10 hours, or 2 hours more than usual), may increase the risk of type 2 diabetes. This might be due to a less efficient sleep with more awakenings during the night. In the current intervention study, with only one extra hour of sleep, the quality was maintained while having metabolic benefits as well.
The authors concluded that a one hour increase in healthy people who normally sleep too little can have positive effects on reducing diabetes risk, but further investigation in patients with pre-diabetes and diabetes is needed for a more complete picture.

The current sleep recommendations, according to a recently published report from the National Sleep Foundation, are as follows:

- New-borns (0-3 months): 14-17 hours
- Infants (4-11 months): 12-15 hours
- Toddlers (1-2 years): 11-14 hours
- Pre-schoolers (3-5): 10-13 hours
- School age children (6-13): 9-11 hours
- Teenagers (14-17): 8-10 hours
- Younger adults (18-25): 7-9 hours
- Adults (26-64): 7-9 hours
- Older adults (65+): 7-8 hours

For further information, please see: