Getting a good night's sleep may help loose weight and possibly reduce the risk of developing diabetes

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Getting a good night's sleep may help you stay slim and possibly reduce the risk of developing diabetes

Lack of sleep or disrupted sleep patterns in shift workers may lead to an increased risk of diabetes and obesity, as found in a study conducted by researchers from the Brigham and Women's Hospital and the Harvard Medical School in Boston, USA.

Recent epidemiological studies have shown associations between short sleep duration and circadian rhythms, i.e. the biological processes that occur regularly at about 24-hour intervals. Sleep disruption can lead to adverse metabolic changes which in turn increase the risk of chronic diseases including obesity and type II diabetes, and even mortality. To further explore this, researchers tested their hypothesis that prolonged sleep restriction with concurrent circadian disruption would impair glucose regulation and metabolism.

A total of 21 healthy participants (11 male, 10 female) completed the study: 11 young (23 +/- 2 years) and 10 older (60 +/- 5 years) individuals. None had a history of regular night shift work in the last 3 years and none had travelled across more than two time zones in the 3 months before the study began.

Participants were instructed to spend 10 hours in bed each night and gain normal exposure to daytime light, for at least 3 consecutive weeks immediately before the start of the study. The participants then spent 3 weeks in a laboratory setting in which they got 5.6 hours of sleep per 24 hour period, while simultaneously experiencing 28 hour circadian days – a state similar to 4 hours of jet lag accumulating each day. This design allowed studying the effects of sleep restriction as well as circadian disruption. A segment of 9 recovery days concluded the intervention.

Simultaneous exposure to chronic sleep restriction and circadian rhythm disruption caused a 32% decrease in insulin secretion in response to a standardized meal, the resultant higher blood glucose in some cases reaching levels considered pre-diabetic. This magnitude of disruption, coupled with a lower resting metabolic rate (8%) measured in the participants during the 3 treatment weeks, translates into an estimated average 12.5 pound increase in body weight over a single year (120kcal per day x 365 days divided by 3500kcal per pound of fat mass). Assuming no changes in activity or food intake occurred, it also emerged that this could easily set the stage for development of diabetes and obesity, although the exact process by which this happens awaits further study.

The results of this study suggest that the efforts to reduce the health impact and risk of diabetes in shift workers should focus on improving sleep duration and circadian realignment strategies. We are beginning to understand the extent to which sleep deficiency impairs glucose metabolism, yet more research is necessary to determine the extent, mechanisms, and dynamics of these changes.

For more information, see

Buxton O.M. et al. (2012). Adverse Metabolic Consequences in Humans of Prolonged Sleep Restriction Combined with Circadian Disruption. Science Translational Medicine 4(129):129ra43.