


Sleep Duration and Obesity

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Sleep has an important role in promoting the normal activities and health of the body. Recent studies have shown that lack of sleep quality and sleep time lead to various health changes. In particular, research has shown that sleep time is related to the incidence of cardiovascular disease and mortality.¹ In addition, a difference in the incidence of obesity according to sleeping time was reported.²⁻⁸ In other words, if the appropriate sleep time is not achieved, the rate of obesity increases. Epidemiologic studies of sleep and obesity in many countries have shown a similar pattern of decrease in sleep time and increase in obesity. According to a US survey, the proportion of people sleeping more than the recommended 8 hours decreased from 38% in 2001 to 26% in 2005.³ In Korea, the percentage of people who sleep more than 6 hours a day increased from 15.6% in the 1960s to 38.6% in 2001, while the percentage of people reporting 7-8 hours of sleep decreased from 58.8% in 1998 to 52% in 2001.⁶ In most studies, 7-8 hours of sleep seems to be associated with the smallest proportion of obesity. In Korea, the results of the National Health and Nutrition Examination Survey conducted from 2001 to 2005 showed that the relative risk of obesity was 24% when sleep time was less than 5 hours. The risk of developing abdominal obesity was reported to increase by 22%.⁶ It is also known that short sleep time increases the incidence of type 2 diabetes and metabolic syndrome.^{2,9-11} The relationship between sleeping time and obesity by age has not been studied

much, but the relationship between short sleep time and obesity seems to be clearer at a young age.⁸

The mechanism by which short sleep time induces obesity is not yet clear, but various hypotheses are being established.⁴ Short sleep time is known to be highly involved in appetite control. In particular, it increases the secretion of ghrelin, which induces an increase in appetite and inhibits the secretion of leptin, which helps suppress appetite.^{2,5} This means that the shorter is the sleep time, the greater is the feeling of hunger, thereby increasing the food intake. Sleep deprivation also tends to induce sympathetic nervous system activity, increase secretion of cortisol, and increase secretion of growth hormone (GH) at night.^{9,10,12} This may lead to insulin resistance and problems with blood glucose control. This process is thought to lead to the development of type 2 diabetes and metabolic syndrome. It is known that, in a normal sleeping process, a change in blood glucose control occurs in order to keep blood sugar constant. During non-REM sleep, the use of blood sugar is lowest; that during REM sleep is highest, while blood glucose level is lowest. However, as sleep time decreases, there is a change in the mechanism of blood glucose control during sleep, and this change may increase the likelihood of glucose control abnormality. In addition, the increase in appetite due to short sleep duration causes an increase of visceral fat and insulin resistance, which can affect the development of diabetes and metabolic syndrome. Short sleep

time causes excessive daytime sleepiness and naturally affects activity in everyday life.¹³ This leads to a reduction in intentional athletic activity, resulting in a reduction in overall energy expenditure. The relationship between quality of sleep and obesity is not yet clear. In some studies, researchers have reported that the lower is the satisfaction with sleep, the higher is the incidence of obesity-related metabolic syndrome.^{14,15} Ultimately, control of the duration and quality of sleep will be important in controlling the risk of obesity and metabolic diseases.

CONFLICTS OF INTEREST

There is no conflict of interest to declare.

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