Format: Abstract

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Impact of sleep debt on metabolic and endocrine function.

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Abstract

BACKGROUND: Chronic sleep debt is becoming increasingly common and affects millions of people in more-developed countries. Sleep debt is currently believed to have no adverse effect on health. We investigated the effect of sleep debt on metabolic and endocrine functions.

METHODS: We assessed carbohydrate metabolism, thyrotropic function, activity of the hypothalamo-pituitary-adrenal axis, and sympathovagal balance in 11 young men after time in bed had been restricted to 4 h per night for 6 nights. We compared the sleep-debt condition with measurements taken at the end of a sleep-recovery period when participants were allowed 12 h in bed per night for 6 nights.

FINDINGS: Glucose tolerance was lower in the sleep-debt condition than in the fully rested condition ($p<0.02$), as were thyrotropin concentrations ($p<0.01$). Evening cortisol concentrations were raised ($p=0.0001$) and activity of the sympathetic nervous system was increased in the sleep-debt condition ($p<0.02$).

INTERPRETATION: Sleep debt has a harmful impact on carbohydrate metabolism and endocrine function. The effects are similar to those seen in normal ageing and, therefore, sleep debt may increase the severity of age-related chronic disorders.

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