

**Published online before print April 3, 2006,
doi:10.1161/01.HYP.0000217362.34748.e0**

(*Hypertension*. 2006;47:833.)

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Original Articles

Short Sleep Duration as a Risk Factor for Hypertension

Analyses of the First National Health and Nutrition Examination Survey

James E. Gangwisch; Steven B. Heymsfield; Bernadette Boden-Albala; Ruud M. Buijs; Felix Kreier; Thomas G. Pickering; Andrew G. Rundle; Gary K. Zammit; Dolores Malaspina

From the Department of Epidemiology, Mailman School of Public Health (J.E.G., A.G.R.), and Departments of Neurology and Sociomedical Sciences (B.B.-A.), Department of Medicine, Behavioral Cardiovascular Health and Hypertension Program (T.G.P.), Department of Psychiatry and Clinilabs Sleep Disorders Institute (G.K.Z.), and Department of Psychiatry, Division of Clinical Neurobiology (D.M.), College of Physicians and Surgeons, Columbia University, New York, NY; Merck Research Laboratories (S.B.H.), Rahway, NJ; Netherlands Institute for Brain Research (R.M.B., F.K.), Amsterdam, the Netherlands; and University of Vera Cruz (R.M.B.), Xalapa, Mexico.

Correspondence to James E. Gangwisch, Department of Epidemiology, Mailman School of Public Health, Columbia University, 722 West 168th St, Room R720E, New York, NY 10032. E-mail jeg64@columbia.edu

Depriving healthy subjects of sleep has been shown to acutely increase blood pressure and sympathetic nervous system activity. Prolonged short sleep durations could lead to hypertension through extended exposure to raised 24-hour blood pressure and heart rate, elevated sympathetic nervous system activity, and increased salt retention. Such forces could lead to structural adaptations and the entrainment of the cardiovascular system to operate at an elevated pressure equilibrium. Sleep disorders are associated with cardiovascular disease, but we are not aware of any published prospective population studies that have shown a link between short sleep duration and the incidence of hypertension in subjects without apparent sleep disorders. We assessed whether short sleep duration would increase the risk for hypertension incidence by conducting longitudinal analyses of the first National Health and Nutrition Examination Survey ($n=4810$) using Cox proportional hazards models and controlling for covariates. Hypertension incidence ($n=647$) was determined by physician diagnosis, hospital record, or cause of death over the 8- to 10-year follow-up period between 1982 and 1992. Sleep durations of 5 hours per night were associated with a significantly increased risk of hypertension (hazard ratio, 2.10; 95% CI, 1.58 to 2.79) in subjects between the ages of 32 and 59 years, and controlling for the potential confounding variables only partially attenuated this relationship. The increased risk continued to be significant after controlling for obesity and diabetes, which was consistent with the hypothesis that these variables would act as partial mediators. Short sleep duration could, therefore, be a significant risk factor for hypertension.

Key Words: circadian rhythm • obesity • diabetes mellitus • hypertension, essential • sleep

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