Outline

Abstract
Résumé
References

Cited By (207)

Electroencephalography and Clinical Neurophysiology
Volume 51, Issue 5, May 1981, Pages 494-501

The effects of high and low ambient temperatures on human sleep stages

Effets de températures ambiantes élevées basses sur les stades de sommeil chez l'homme ☆

E.H Haskell [a, b, 1], J.W Palca [a, b, 1], J.M Walker [a, b, 1], R.J Berger [a, b, 1], H.C Heller [a, b, 1]

https://doi.org/10.1016/0013-4694(81)90226-1

Abstract

Six male subjects slept nude except for shorts on a bed made from nylon webbing at 5 different ambient temperatures (T_as): 21, 24, 29 (thermoneutrality), 34 and 37°C. Standard electrophysiological recordings were obtained and analyzed for sleep stages.

Temperature displayed significant quadratic trends for nearly every sleep variable, such that T_as above or below thermoneutrality had similar effects on sleep patterns. Multiple comparisons showed that 21°C was the most disruptive condition, and that cold T_as were generally more disruptive to sleep than warm T_as. There were marked individual differences in sensitivity of sleep to cold.

Decreases in REM sleep in humans produced by heat or cold probably result from a general disruption of sleep processes rather than being specifically related to the status of the thermoregulatory system during REM sleep.

Résumé

Six sujets de sexe masculin ont dormi nus à l'exception d'un short, sur un lit fait de sangles de nylon à 5 températures ambiantes différentes (T_a): 21, 24, 29 (thermoneutralité), 34 et 37°C. Des enregistrements électrophysiologiques standards ont permis l'analyse des stades de sommeil.

On note des tendances quadratiques significatives entre température et à peu près toutes les variables du sommeil, de telle sorte que les T_a supérieures ou inférieures à la thermoneutralité ont des effets similaires sur les patterns de sommeil. Les comparaisons multiples ont montré que 21°C constituait la condition de plus grandes perturbations, et que les T_a froides ont davantage perturbé le sommeil que les T_a chaudes. Les auteurs on montré d'importantes différences individuelles dans la sensibilité du sommeil au froid.

La diminution du sommeil paradoxal chez l'homme, provoquée par la chaleur ou le froid, résulte probablement d'une perturbation générale des processus de sommeil plutôt que d'une liaison significative avec l'état du système thermo-régulateur au cours du sommeil paradoxal.

Previous article in issue Next article in issue

Cited by (207)

Effect and attributable burden of hot extremes on bacillary dysentery in 31 Chinese provincial capital cities
2022, Science of the Total Environment
Show abstract

Defining local extreme heat thresholds and Indoor Cooling Degree Necessity for vulnerable residential dwellings during the 2020 summer in Ankara – Part I: Air temperature
2022, Solar Energy
Show abstract

Data fusion of mobile and environmental sensing devices to understand the effect of the indoor environment on measured and self-reported sleep quality
2022, Building and Environment
Show abstract

The effects of ventilation and temperature on sleep quality and next-day work performance: pilot measurements in a climate chamber
2022, Building and Environment
Show abstract

Simulation and optimization of the key parameters of combined floor and Kang heating terminal based on differentiated thermal demands
2022, Energy and Buildings
Show abstract

Questionnaire survey and field investigation on sleep thermal comfort and behavioral adjustments in bedrooms of Chinese residents
2021, Energy and Buildings
Show abstract

* Supported by NIH Grants GM-23694 awarded to R.J. Berger and GM-23695 awarded to H.C. Heller.

1 We thank Charles Darby, Vance Harris and Larry Walker for their assistance in various phases of this study.