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ORIGINAL RESEARCH COMMUNICATION

High-glycemic-index carbohydrate meals shorten sleep onset [1,2,3]

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Background: Dietary carbohydrate intake has been shown to increase the plasma concentration of tryptophan, a precursor of serotonin and sleep-inducing agent.

Objective: To investigate the role of carbohydrate in sleep induction, we explored the effect of glycemic index (GI) and meal time on sleep in healthy volunteers.

Design: We compared the effect of high- and low-GI carbohydrate–based meals ingested 4 h before bedtime on sleep quality. We also evaluated the effect of the timing of high-GI meals (4 h compared with 1 h) on sleep quality. Twelve healthy men (aged 18-35 y) were administered standard, isocaloric (3212 kJ; 8% of energy as protein, 1.6% of energy as fat, and 90.4% of energy as carbohydrate) meals of either Mahatma (low GI = 50) or Jasmine (high GI = 109) rice 4 h before their usual bedtime. On another occasion, the high-GI meal was given 1 h before bedtime. The participants underwent a familiarization night followed by 3 test nights in random order 1 wk apart.

Results: A significant (P = 0.009) reduction in the mean (±SD) sleep onset latency (SOL) was observed with a high-GI (9.0 ± 6.2 min) compared with a low-GI (17.5 ± 6.2 min) meal consumed 4 h before bedtime. The high-GI meal given 4 h before bedtime showed a significantly shortened SOL compared with the same meal given 1 h before bedtime (9.0 ± 6.2 min compared with 14.6 ± 9.9 min; P = 0.01). No effects on other sleep variables were observed.

Conclusions: We showed that a carbohydrate-based high-GI meal resulted in a significant shortening of SOL in healthy sleepers compared with a low-GI meal and was most effective when consumed 4 h before bedtime. The relevance of these findings to persons with sleep disturbance should be determined in future trials.

Key Words: Carbohydrates • glycemic index • sleep quality • sleep timing

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