

Cranial manipulation can alter sleep latency and sympathetic nerve activity in humans: a pilot study.

Cutler MJ, Holland BS, Stupski BA, Gamber RG, Smith ML.

Department of Integrative Physiology, University of North Texas Health Science Center, Fort Worth, TX, USA. mcutler@metrohealth.org

Abstract

OBJECTIVE: To determine if cranial manipulation is associated with altered sleep latency. Furthermore, we investigated the effects of cranial manipulation on muscle sympathetic nerve activity (MSNA) as a potential mechanism for altered sleep latency.

DESIGN: Randomized block design with repeated measures.

SETTING: The Integrative Physiology and Manipulative Medicine Departments, University of North Texas Health Science Center, Fort Worth, TX.

SUBJECTS: Twenty (20) healthy volunteers (12 male, 8 female; age range, 22-35 years) participated in this investigation.

INTERVENTIONS: Subjects were exposed to 3 randomly ordered treatments: compression of the fourth ventricle (CV4), CV4 sham (simple touch), and control (no treatment).

OUTCOME MEASURES: Sleep latency was assessed during each of the treatments in 11 subjects, using the standard Multiple Sleep Latency Test protocol. Conversely, directly recorded efferent MSNA was measured during each of the treatments in the remaining 9 subjects, using standard microneurographic technique.

RESULTS: Sleep latency during the CV4 trial was decreased when compared to both the CV4 sham or control trials ($p < 0.05$). MSNA during the CV4-induced temporary halt of the cranial rhythmic impulse (stillpoint) was decreased when compared to prestillpoint MSNA ($p < 0.01$). During the CV4 sham and control trials MSNA was not different between CV4 time-matched measurements ($p > 0.05$). Moreover, the change in MSNA prestillpoint to stillpoint during the CV4 trial was different compared to the CV4 sham and control trials ($p < 0.05$). However, this change in MSNA was similar between the CV4 sham and control trials ($p > 0.80$).

CONCLUSIONS: The current study is the first to demonstrate that cranial manipulation, specifically the CV4 technique, can alter sleep latency and directly measured MSNA in healthy humans. These findings provide important insight into the possible physiologic effects of cranial manipulation. However, the mechanisms behind these changes remain unclear.