

## Effect of Chiropractic Care on Heart Rate Variability and Pain in a Multisite Clinical Study

**Objective:** The purpose of this study is to investigate the effect of chiropractic care in a multi-clinic setting on sympathetic and parasympathetic nervous system activities using heart rate variability (HRV) analysis.

**Methods:** Physicians of chiropractic in private practice were provided with an HRV device to perform analysis before and after chiropractic adjustments on 10 subjects. At each site, 8 subjects were monitored before and after a single chiropractic adjustment, and 2 additional patients were followed for a 4-week period with 2 HRV recordings per week. Patient information forms and a visual analog scale (VAS) questionnaire were completed both before and after each chiropractic adjustment.

**Results:** Data from 96 physicians were divided into single-visit and 4-week groups. After 1 chiropractic adjustment, pain as analyzed by VAS was reduced significantly from  $3.7 \pm 2.2$  to  $2.1 \pm 2.0$  ( $P < .001$ ). The mean heart rate reduced from  $76.7 \pm 12.7$  to  $74.3 \pm 12.4$  ( $P < .01$ ), the SD of normal-to-normal QRS increased from a range of 55.8 to 44.6 to a range of 60.6 to 47.2 ( $P < .001$ ), the high-frequency component increased from  $359 \pm 968$  to  $444 \pm 1069$  ( $P < .01$ ), the low-frequency component increased from  $403 \pm 753$  to  $465 \pm 755$  ( $P < .05$ ), and the total power increased from  $1063 \pm 1886$  to  $1265 \pm 2048$  ( $P < .01$ ). After 4 weeks of chiropractic adjustments, pain measured by the VAS was reduced significantly before and after each visit as analyzed by t tests, but the significant changes were not found using analysis of variance analysis. The reduction of pain from each treatment was not maintained over the 4 weeks of study period. The analysis of variance on the HRV 4-week data found that changes in the SD of normal-to-normal QRS, total power, and low-frequency components reached statistically significant levels ( $P < .05$ ). The heart rate and the high-frequency component did not change significantly ( $P > .05$ ).

**Conclusion:** In this study, HRV and VAS changed in patients as a result of chiropractic care.