

included the pro-inflammatory TNF alpha, Interleukin-1, Interleukin-6, C Reactive Protein (CRP) and the anti-inflammatory Interleukin-10. These measurements were obtained at baseline, 1, 3 and 6 months. The Ethics Approval Number: HE26SEPT2003-RO2600. The trial was registered with the Australian and New Zealand Clinical Trials Registry ACTRN1260800002381.

Results: A strongly significant statistical difference was detected between groups in all measures assessed in this RCT. The average changes in each of the paper based measures were in the order of 35% improvement ($p < 0.001$). All blood inflammatory markers such as CRP (<0.02), Interleukin-1 (<0.02), Interleukin-6 (<0.01), Interleukin-10 (<0.001) and TNF-alpha (<0.001) were also significantly improved. The numbers of participants who fell out of the normal range for each blood marker were analysed. We used a threshold analysis of normal pathological ranges because this is the criterion that is adhered to when diagnosis is given. Outcomes were analysed using standard chi-squared statistical analysis taking into account the attrition rate percentages of both groups. All randomised participants were analysed, including dropouts eliminating any intention to treat issues.

Conclusion: For the first time a stress relieving technique, NET, was able to demonstrate universal changes in all measures of pain, disability, emotion and health in both subjective paper based outcomes and objective blood based assessments of inflammation in a group of chronic LBP sufferers. Changes in these blood markers are significant to the effect that they may also reduce the risk of serious illness (cardiovascular, chronic bowel, and cancer) as these markers are usually used as indicators for these diseases (especially cardiovascular disease risk). Further study is required to determine if NET can alter the progression of any of these common and debilitating disorders.

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A randomized controlled trial to measure the effects of specific thoracic chiropractic adjustments on blood pressure and pulse rate[☆]

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Objective: Previous studies on the effects of chiropractic treatment on blood pressure (BP) and pulse rate (PR) have reported decreases in both systolic and diastolic BP as well as PR. However, those studies have been criticized as being flawed, and accused of drawing erroneous conclusions, due to small sample size and various methodological concerns. The purpose of this randomized controlled trial (RCT) was to measure the effects of specific thoracic (T5 to T1) chiropractic adjustments on BP and PR in a larger sample size of both normotensive and hypertensive humans.

Methods: After internal review board (IRB) approval, informed consent was obtained and 290 human subjects who met the inclusion criteria were randomly assigned to one of three groups: Control ($N = 95$; no treatment, no placebo); Placebo Treatment ($N = 96$; sham adjustment with inactive device); or Active Treatment ($N = 99$; adjustment with active device). Subjects were seated in a relaxing climate-controlled room for a minimum of 15 min prior to obtaining a baseline blood pressure (BP) (systolic and diastolic) and pulse rate (PR) measurement with an electronic oscillometric BP monitor. The subjects were then moved to chairs stationed according to the study group in which they were assigned. Subjects had another BP and PR measured (anxiety BP and PR measurements) after being called upon for active treatment, placebo treatment, or no treatment at all. Active treatment involved the use of the Activator IV adjusting instrument to correct subluxations detected according to the Activator Methods Chiropractic Technique for thoracic vertebrae T5 to T1. Placebo treatment was performed with an Activator II10 adjusting instrument in the off position which mimics all aspects of the treatment that is administered when in the on position but no manipulative force is delivered. Following active treatment (or placebo treatment or no treatment), subjects had their BP and PR measured once again.

Results: Subjects ranged in age from 18 to 100 years old (mean age = 52) and 66% of them were female. Systolic and diastolic BP decreased significantly ($p = 0.0001$) in the active treatment group, whereas no significant changes occurred in the placebo treatment and control groups. Similarly, PR decreased significantly ($p = 0.0001$) in the active treatment group, whereas no significant changes occurred in the placebo treatment and control groups.

Discussion: Previous smaller studies, with various weaknesses, served as the foundation for this larger and important RCT. The results of this RCT indicate, with strong statistical significance, that specific thoracic (T5 to T1) chiropractic adjustments decrease systolic and diastolic BP, as well as PR.

Conclusion: This important and significant RCT demonstrates that specific thoracic chiropractic adjustments decrease BP and PR. A follow-up longitudinal pilot study of both normotensive and hypertensive subjects is currently in progress by the authors to determine how long a decrease in BP and PR is sustained following specific chiropractic adjustments. Hypertension and its adverse effects are worldwide health problems warranting further studies on the effects of chiropractic adjustments on BP and PR.

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Measuring the effects of specific cervical chiropractic adjustments on blood pressure and pulse rate: A randomized controlled trial[☆]

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Objective: Several studies have reported the effects of various specific cervical chiropractic adjustments on blood pressure and pulse rate; however, those studies have been criticized due to small sample size and various methodological concerns. The purpose of this randomized controlled trial (RCT) was to measure the effects of specific cervical (C3 to Occiput [C0]) chiropractic adjustments on blood pressure (BP) and pulse rate (PR) in a larger sample size of both normotensive and hypertensive humans.

Methods: After internal review board (IRB) approval, informed consent was obtained and 331 human subjects who met the inclusion criteria were randomly assigned to one of three groups: Control ($N = 108$; no treatment, no placebo); Placebo Treatment ($N = 117$; sham adjustment with inactive device); or Active Treatment ($N = 106$; adjustment with active device). Subjects were seated in a relaxing climate-controlled room for a minimum of 15 min prior to obtaining a baseline blood pressure (BP) (systolic and diastolic) and pulse rate (PR) measurement with an electronic oscillometric BP monitor. The subjects were then moved to chairs stationed according to the study group in which they were assigned. Subjects had another BP and PR measured (anxiety BP and PR measurements) after being called upon for active treatment, placebo treatment, or no treatment at all. Active treatment involved the use of the Activator IV6 adjusting instrument to correct subluxations detected according to the Activator Methods Chiropractic Technique 7 for cervical vertebrae C3 to C0. Placebo treatment was performed with an Activator I18 adjusting instrument in the off position which mimics all aspects of the treatment that is administered when in the on position but no manipulative force is delivered. Following active treatment (or placebo treatment or no treatment), subjects had their BP and PR measured once again.

Results: Subjects ranged in age from 18 to 85 years old (mean age = 52) and 64% of them were female. Systolic and diastolic BP decreased significantly ($p < 0.0001$) in the active treatment group, whereas no significant changes occurred in the placebo treatment and control groups. Similarly, PR decreased significantly ($p < 0.0001$) in the active treatment group, whereas no significant changes occurred in the placebo treatment and control groups.

Discussion: Similar smaller studies, utilizing various chiropractic adjusting techniques, served as the foundation for this larger and important RCT. The results of this RCT indicate, with strong statistical significance, that specific cervical (C3 to C0) chiropractic adjustments decrease systolic and diastolic BP, as well as PR.

Conclusion: This significant and important RCT demonstrates that specific cervical chiropractic adjustments decrease BP and PR. In follow-up to this RCT, a longitudinal pilot study of both normotensive and hypertensive subjects is currently in progress by the authors to determine how long a decrease in BP and PR is sustained following specific cervical chiropractic adjustments. Given the worldwide burden of hypertension and its adverse effects on health, further studies on the effects of chiropractic adjustments on BP and PR are warranted.

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