

Title: The effect of McTimoney chiropractic treatment on equine back dimensions.

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Introduction: Studies have identified the extent of changes in dimension of the thoracolumbar region of the horse's back after a thirty minute period of exercise and over the course of one year (Greve *et al.*, 2015; Greve & Dyson, 2015). There is, however, no information on the influence of manual therapy on changes in thoracolumbar dimensions of the equine back. The aim of this study was to determine whether a single McTimoney chiropractic treatment influences equine back width dimensions typically measured in the assessment of saddle fit.

Material & methods: A controlled, paired, randomised and double-blinded study was conducted using twelve riding horses (geldings=4; mares=8), with mean±s.d age 4.8±1.2 years and height 140.9±6.6 cm. Veterinary consent was obtained and treatments were carried out by a qualified McTimoney animal practitioner. The horses were matched into pairs by management regime, degree of saddle fit behind the shoulder, age and height, and each pair was randomly allocated into the treatment or control group. The treatment group (n=6) received a single manual chiropractic treatment following palpation. The control group received palpation only. Thoracolumbar dimensions were measured in triplicate using a flexicurve ruler (FCR) at predetermined sites T8, T13, T18 and three fingers behind the scapulae (3f), the day before (Pre-Tx), immediately post-treatment (Post-Tx) and three consecutive days (D1, D2, D3) after treatment. Horses were not ridden during this period. Measures were taken by a single investigator who was previously tested for acceptable repeatability of measurement. At each site, paraspinous trunk width was measured at set distances lateroventral to the dorsal midline (3.5cm, 7cm and 10.5cm at T8 and 3f, and 3cm and 6cm at T13 and T18). Statistical analysis using SPSS (IBM version 22.0) included repeated measures ANOVA to evaluate differences between pre- and post-treatment measurements for the treatment and control groups, separately. Post-hoc tests, Least Significant Difference (LSD) and Tukey's test analysed pairwise comparisons.

Results: Across all subjects in the treatment group, positive mean changes in width dimensions were significant ($p < 0.05$) at the 10.5cm distance lateroventral to the dorsal midline at T8 ($p = 0.049$) and at all three distances at 3f (3.5cm $p = 0.016$, 7cm $p = 0.009$ and 10.5cm $p = 0.006$). Peak changes were significant ($p < 0.05$), immediately post-treatment (post-Tx dorsal to ventral mean changes of 0.81cm-0.87cm at T8; 0.83cm-1.05cm at 3f) and pre-Tx to D3 (0.76cm-1.06cm at T8; 0.95cm-1.27cm at 3f). There were no significant ($p > 0.05$) changes in dimension at any measurement location for the control group.

Discussion & conclusions: This study suggests that McTimoney chiropractic treatment can have a quantifiable effect on back dimensions immediately post-treatment, and up to three days following treatment. This may have implications on saddle-fit assessment during this time period. Further research is recommended with larger cohorts and to determine longevity of changes.

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References: Greve, L., Murray, R., Dyson, S. (2015). Subjective analysis of exercise-induced changes in back dimensions of the horse: The influence of saddle-fit, rider skill and work-quality. *The Veterinary Journal*, 206 pp. 39 – 46.

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