



# An investigation into the effect of the relationship between spinal vertebrae alignment and the performance of FEI international 1\* event horses at a British Eventing competition

\*Keay, R., Hedderly, S., Hunnisett, A.

McTimoney College of Chiropractic, Kimber Road, Abingdon, Oxon, OX14 1BZ, UK

## INTRODUCTION

Chiropractic techniques focus on correction of joint dysfunction of the spine and pelvis to restore optimal nerve and muscle function and the symmetry of the musculoskeletal system.

Previous research has mainly focused on the effect of the treatment on muscle tone (Wakeling et al, 2006, Langstone et al, 2015) and horse kinematics (Guest et al, 2014). No published research could be found on what effect vertebral joint dysfunction, measured by chiropractic alignment palpation, may have on the horses' competitive performance.

This study investigates whether there is a relationship between number of vertebral misalignments (MA's), pelvic asymmetry and the overall placings of FEI 1\* competition horses at a British Eventing (BE) event.

## METHODOLOGY

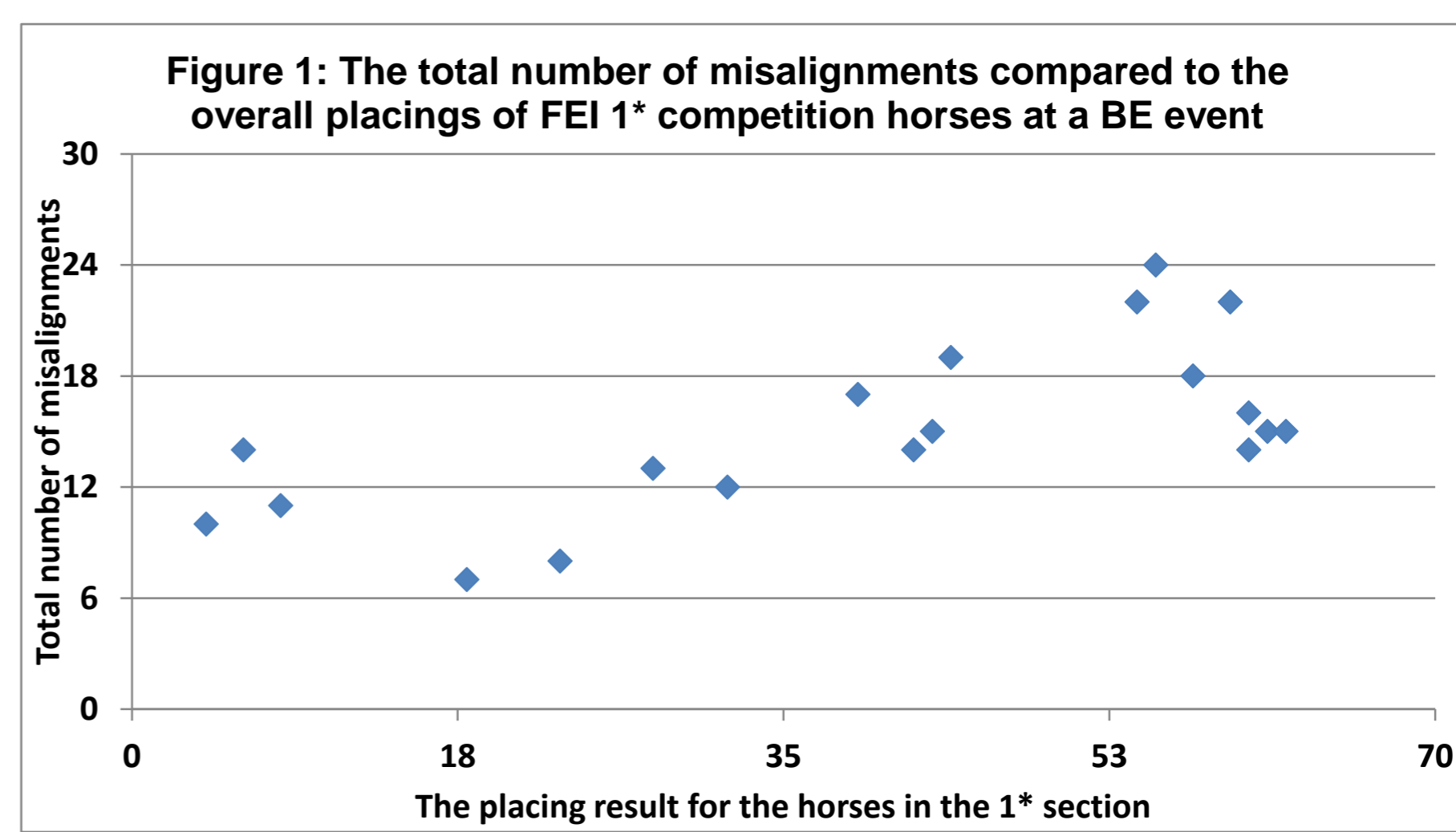
- A cross section observational study using 19 randomly selected sound horses competing at a BE FEI 1\* competition.
- The day before the competition, horses were stood square on a level surface and the numbers of cervical, thoracic and lumbar MA's were collected by palpation and pelvic asymmetry measured using a plumb line technique.
- History of horse and rider (previous injuries or illnesses, level competed at, any manipulative therapy) were noted.
- Spearman's Rank correlation test was used to test the association between the mean number of spinal misalignments and pelvic symmetry indices (SI) with the overall placings and placings after each phase of the competition (dressage, cross country, show jumping). Statistical level of significance was  $P < 0.05$ .

## RESULTS

Significant positive associations were found:

- between the total number of misalignments and the overall placings ( $R=0.636$ ,  $p=0.002$ )
- between the total number of misalignments and placings after the cross country phase ( $R=0.715$ ,  $p=0.0005$ )
- between number of cervical misalignments and the cross country phase placings ( $R=0.580$ ,  $p=0.009$ ) and overall placings ( $R=0.482$ ,  $p=0.03$ )
- between number of thoracic misalignments and the cross country placings ( $R=0.760$ ,  $p=0.0001$ ) and the overall results ( $R=0.667$ ,  $p=0.001$ )
- between the number of lumbar misalignments and the cross country placings ( $R=0.465$ ,  $p=0.04$ )

Significant negative association occurred between pelvic rotation asymmetry and placings after the dressage phase ( $R=-0.539$ ,  $p=0.01$ ) and overall placings ( $R=-0.477$ ,  $p=0.038$ )



## DISCUSSION & CONCLUSIONS

- Event horses that had a lower total number of misalignments were more likely to be placed higher in a FEI 1\* eventing competition.
- Horses with a lower number of MA's in cervical, thoracic and lumbar regions were more likely to have a higher placing after the cross country phase
- Horses with a more symmetrical pelvis tended to be placed higher in dressage and overall.
- Further research of effects of correcting MA's on performance parameters is recommended.

## APPLICATION TO INDUSTRY

Correction of vertebral misalignments and pelvic asymmetry, potentially by chiropractic techniques, may improve performance success at eventing competitions.

## REFERENCES

- Guest, J., Hedderly, S., Charlton, S., Cunliffe, C. (2014) The effects of chiropractic treatment on the range of motion of the carpus and tarsus of horses. *Advances in Animal Biosciences* Vol 5 (1)
- Langstone J., Ellis J., Cunliffe C. (2015) A preliminary study of the effect of manual chiropractic treatment on the splenius muscle in horses when measured by surface electromyography. *Equine Veterinary Journal* Vol.47 (S48)
- Wakeling, J.M., Barnett, K., Price, S., and Nankervis, K. (2006) Effects of manipulative therapy on the longissimus dorsi in the equine back. *Equine and comparative exercise physiology*. 3(3), 153-160