

AN INVESTIGATION INTO THE RELATIONSHIP OF PELVIC MISALIGNMENT ON FORELIMB HOOF SIZE

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OBJECTIVE: To determine if there is a link between pelvic misalignment in the horse and uneven forelimb hoof size.

OUTCOME: Evidence of a significant relationship between direction of pelvic rotation to the amount of growth (length and width) of horse's fore-hooves

INTRODUCTION

- Pelvic rotation misalignment is a common problem in horses and can be associated with reduced performance and lameness (Weeren and Crevier-Denoix, 2006).
- The occurrence of differently shaped and sized feet is common of which the clinical significance is unclear (Heel et al, 2006).
- Compensatory mechanisms suggest horses can redistribute locomotor forces to other limbs to off-load a particular limb.
- Previous research suggests that increased loading increases hoof size but no link has been made correlating it with pelvic misalignment.

METHODOLOGY

- 30 sound, healthy, multidiscipline horses trimmed/shod every 6 weeks were assessed
- Triplicate tuber coxae heights were measured from the dorsal aspect to level ground stood square, using a plumb line and measuring stick. Difference between means indicated direction of misalignment.
- A 300mm digital vernier calliper measured triplicate hoof width (lateral to medial edge) and hoof length (dorsal to palmar edge) of both fore-feet, prior to and after farrier trim, at two consecutive 6 week shoeing intervals.
- Methods were tested for reliability and repeatability to ± 1 mm. Statistical analyses included chi-squared, symmetry indices and one-way ANOVA.

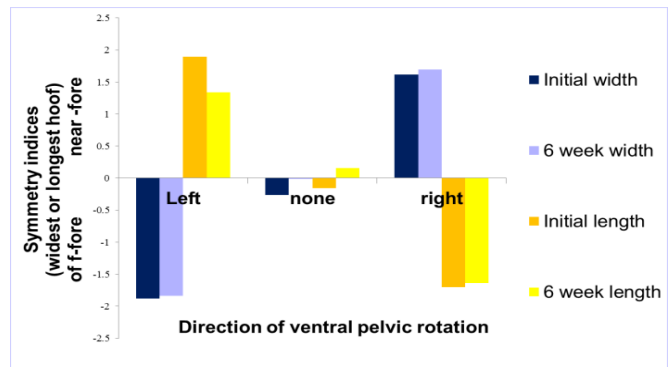
REFERENCES Heel, M.C.V., Kroekenstoel, A.M., Dierendonck, M.C., Weeren, P.R and Back, W. 2006. Equine Veterinary Journal 38. 646-65. Weeren, P.R and Crevier-Denoix, N. 2006. Equine Veterinary Journal 38 (7) 591-596.

RESULTS:

- Horses with a ventral pelvic rotation resulted in more hoof growth width on the contralateral forelimb and more hoof growth length on the ipsilateral forelimb.

Ventral Pelvic Rotation	Mean hoof growth (mm) \pm s.e. for 6 week period			
	Increase in hoof width Near fore	Off fore	Increase in hoof length Near fore	Off fore
Right	3.9 \pm 0.3	1.8 \pm 0.4	3.4 \pm 0.5	5.7 \pm 0.5
Left	3.2 \pm 0.3	5.3 \pm 0.6	4.5 \pm 0.5	2.8 \pm 0.5

- There was a significant relationship between uneven hoof width and pelvic rotation directional ($P < 0.001$); a significant relationship between uneven hoof length and pelvic rotation directional ($P < 0.0001$).
- There was a significant relationship between amount of hoof width growth ($p < 0.001$) and hoof length growth ($p < 0.0001$) with pelvic misalignment
- Symmetry indices demonstrate how near or off fore-hoof was wider or longer in relation to pelvic rotation



CONCLUSIONS

- Evidence of a statistically significant relationship between the alignment of the pelvis and growth (length and width) of horse's fore-hooves.
- Further study would be beneficial in understanding more the chain of compensatory effects on the equine body and in relation to performance matters