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 ±1mm. Statistical analyses included chi-squared, symmetry indices and one-way ANOVA.

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.

<table>
<thead>
<tr>
<th>Ventral Pelvic Rotation</th>
<th>Increase in hoof width</th>
<th>Increase in hoof length</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Near fore</td>
<td>Off fore</td>
</tr>
<tr>
<td>Right</td>
<td>3.9 ± 0.3</td>
<td>1.8 ± 0.4</td>
</tr>
<tr>
<td>Left</td>
<td>3.2 ± 0.3</td>
<td>5.3 ± 0.6</td>
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- 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 the chain of compensatory effects on the equine body and in relation to performance matters

REFERENCES