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DEPARTMENT OF SURGERY AND ANAESTHESIOLOGY OF DOMESTIC ANIMALS

DIAGNOSING NECK AND BACK PAIN PART 1: 'PER EXCLUSIONEM'

Prof. Dr. F. Pille – 36th BEPS annual scientific meeting – November 16th, 2019

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'PER EXCLUSIONEM'

Main question: how to discriminate between a lameness case (painful limbs) and a case with primary pathology of the axial skeleton (painful neck and/or back)?



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- Imaging often unrewarding because of equivocal findings such as:
 - Neck radiography: enlarged facet joint
 - Neck ultrasound: 'synovitis' facet joint
 - Back radiography: kissing spines



The radiographic frequency of impingement of the dorsal spinous processes at purchase examination and its clinical significance in 220 warmblood sporthorses

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Summary: A retrospective study of 220 horses was performed to investigate the association between the clinical signs and the radiological findings of impinging dorsal spinous processes (DSPs) in warmblood sporthorses. For this purpose radiographic records were assessed to identify all horses that had undergone radiographic examination of the back as part of a pre-purchase examination between January 2009 and December 2012. The dorsal spinous processes of 239 horses were assessed and each dorsal spinous process was individually graded (0–3) using a modified 4-group grading system appropriate for routine grading of dorsal spinous processes as part of a pre-purchase examination. Fifty-five percent (n = 121) had no radiological abnormalities of the DSPs (grade 0). However, 26,4% had at least one DSP with grade 1 impingement, 11,8% had at least one DSP with grade 2 and 6,8% had at least one DSP with grade 3. Follow-up information was obtained by telephone responses from owners or trainers. The horses were assessed at a mean follow up time after pre-purchase examination of $25,19 \pm 12,52$ months. Based on the clinical signs included in the questionnaire answers horses were divided into two groups; i) thoracolumbar back pain and ii) no thoracolumbar back pain. Only 11,5% (N = 23) of the 220 horses had shown thoracolumbar back pain. There was no significant association between gender, age or discipline and clinical signs of thoracolumbar back pain. High maximum DSP grade is associated with an increased risk of clinical signs. The specificity of a grade 3 DSP on radiographic screening at pre purchase examinations is high, however the sensitivity is low. This suggests that there is a high risk of clinical signs in horses with grade 3 DSPs and no warranty can be offered for absence of clinical signs for grade 0,1,2.

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Main question: how to discriminate between a lameness case (painful limbs) and a case with primary pathology of the axial skeleton (painful neck and/or back)?

- Imaging often unrewarding because of equivocal findings such as:
 - Neck radiography: enlarged facet joint
 - Neck ultrasound: 'synovitis' facet joint
 - Back radiography: kissing spines
- Clinical exam (!): first step is to rule out (complex presentations of) routine locomotor pathology, mimicing back or neck pain

BACK PAIN AND LAMENESS

In itself, primary thoracolumbar pain does not cause lameness but is mainly associated with poor performance and behavior change

However, relationships exist between (perceived) back pain and lameness since:

- lameness alters back kinematics



The effect of induced hindlimb lameness on thoracolumbar kinematics during treadmill locomotion

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Conclusions: Subtle hindlimb lameness provoked slight but detectable changes in thoracolumbar kinematics. The subtle lameness induced in this study resulted in hyperextension and increased ROM of the thoracolumbar back, but also in decreased ROM of the lumbosacral segment and rotational motion changes of the pelvis.

Potential relevance: Even subtle lameness can result in changes in back kinematics, which emphasises the intricate link between limb function and thoracolumbar motion. It may be surmised that, when chronically present, subtle lameness induces back dysfunction.

General Articles

The effect of induced forelimb lameness on thoracolumbar kinematics during treadmill locomotion

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Conclusions: Both range of motion and vertebral angular motion patterns are affected by subtle forelimb lameness. At walk, the effect is minimal, at trot the horses increased the vertebral range of motion and changed the pattern of thoracolumbar motion in the sagittal and horizontal planes, presumably in an attempt to move the centre of gravity away from the lame side and reduce the force on the affected limb.

Potential relevance: Subtle forelimb lameness affects thoracolumbar kinematics. Future studies should aim at elucidating whether the altered movement patterns lead to back and/or neck dysfunction in the case of chronic lameness.

LAMENESS ALTERS BACK KINEMATICS

1. May lead to back dysfunction / pain:

- i.e. primary lameness and secondary back pain
- Significance secondary back pain ~ level
- Asymptomatic thoracolumbar lesions may become symptomatic (e.g. kissing spines)

LAMENESS ALTERS BACK KINEMATICS

1. May lead to back dysfunction / pain:
 - i.e. primary lameness and secondary back pain
 - Significance secondary back pain ~ level
 - Asymptomatic thoracolumbar lesions may become symptomatic
2. Lameness cases are often perceived as back pain cases by the rider, especially in horses that have developed a 'coping strategy' (e.g. reluctant to work on the bit, hollow back, stiff gait)



Close, impinging and overriding spinous processes in the thoracolumbar spine: The relationship between radiological and scintigraphic findings and clinical signs

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Summary

Reasons for performing study: There has been no objective study comparing radiological features of spinous processes (SPs) in the thoracolumbar region and/or scintigraphic findings with clinical signs.

Objectives: To investigate the relationship between the presence or absence of clinical signs of back pain and: 1) radiological findings of close, impinging or overriding SPs; 2) increased radiopharmaceutical uptake (IRU) in the SPs; and 3) the combination of radiological findings and IRU. Also to determine the prevalence of concurrent osseous pathology.

Methods: Five-hundred and eighty-two horses, presented for perceived back pain and poor performance, underwent comprehensive clinical investigation including diagnostic analgesia of the forelimbs, hindlimbs, back and sacroiliac joints, and radiographic and scintigraphic evaluation of the thoracolumbar spine. Radiological and scintigraphic grades were determined subjectively. Statistical analysis was performed to determine the relationships between clinical signs of back pain, radiological and scintigraphic features, age, breed, gender, discipline, height and weight.

Results: Thoroughbreds (TBs) were over-represented with thoracolumbar pain compared with Warmbloods and TB cross breeds. There was a significant association between maximum and total radiological grades of the SPs and thoracolumbar pain, between maximum and total grades of IRU and thoracolumbar pain, and between a combination of radiological and scintigraphic abnormalities and thoracolumbar pain. Horses with osteoarthritis (OA) of the synovial intervertebral articulations (SIAs) were more likely to have thoracolumbar pain than horses with lesions of the SPs alone, but the presence of OA of the SIAs and lesions of the SPs was associated with the highest likelihood of thoracolumbar pain.

Conclusions and potential relevance: Fore- or hindlimb lameness and/or pain associated with the sacroiliac joints could mimic primary thoracolumbar pain. A combination of radiology and scintigraphy gives the most accurate prediction of thoracolumbar pain, but diagnostic analgesia is crucial for accurate diagnosis.

BILATERAL & QUADRUPEDAL LAMENESS

Often vague signs without clear lameness:

- Stiff, short-strided horse
- Not voluntary to trot
- Reluctant to work and / or compete
- Falsely diagnosed with back problems



- Ridden exam !!!



BACK PAIN AND LAMENESS

In itself, primary thoracolumbar pain does not cause lameness but is mainly associated with poor performance and behavior change

However, relationships exist between (perceived) back pain and lameness since:

- lameness alters back kinematics
- (back pain leads to altered balance which may predispose to lameness)



NECK PATHOLOGY AND LAMENESS

Neck pathology is associated with variable clinical signs:

- Incoördination & weakness when the spinal cord is involved (cf. Dr. J. Rijckaert)
- Osteo-articular and/or neurogenic pain from facet joint OA: front limb lameness can be seen with caudal pathology (cf. Dr. F. Vandenberghe)
 - Exclude 'painful limb' by analgesic techniques
 - (Confirm facet joint pain by local analgesia)



CONCLUSION

- Cases with perceived back or neck pain always need an in-depth locomotor exam (also ridden)
- Front limb lameness may be seen with caudal neck facet joint OA: first exclude other lameness causes
- Primary thoracolumbar pathology does not cause lameness (but may theoretically predispose to it)
- Lameness alters back kinematics:
 - Lameness is often perceived as back pain!!!
 - Lameness may activate asymptomatic lesions



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